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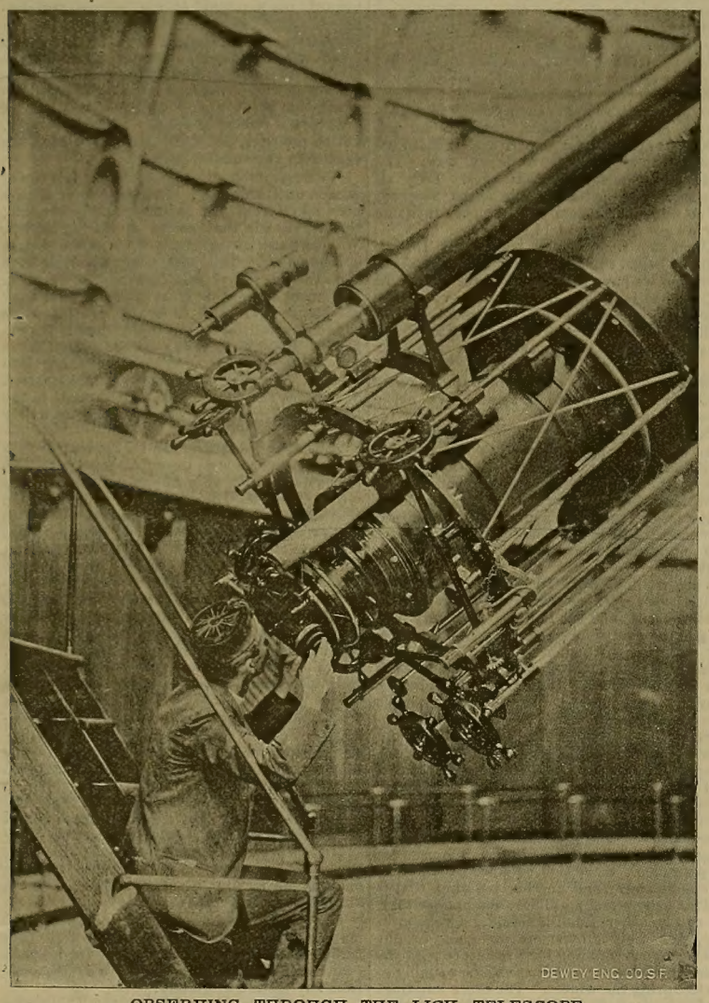
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OBSERVING THROUGH THE LICK TELESCOPE.

The Lick Telescope.

On this page is given a photo-facsimile of the eye end of the great 36-inch Lick telescope at the Mount Hamilton Observatory. Some idea is given of the complicated mechanism by which the glassis controlled, it being so arranged as to be under the com plete control of the observer. Moreover, one may see from this picture the great size of the telescope—comparing the figure of the man with that portion of the instrument in view.

This picture was made direct from a photograph without redrawing, so that it is a perfect reproduction, showing the eye end of the glass without distortion or change of any kind. This is a valuable feature in representing things of this nature, since there are no "fancy touches" or changes possible by the artist.

We have, in the PRESS of June 23, 1888, given a description of the Lick telescope and observatory, with engravings; so it is unnecessary to refer at this time to any details, which can be learned by referring to that number.

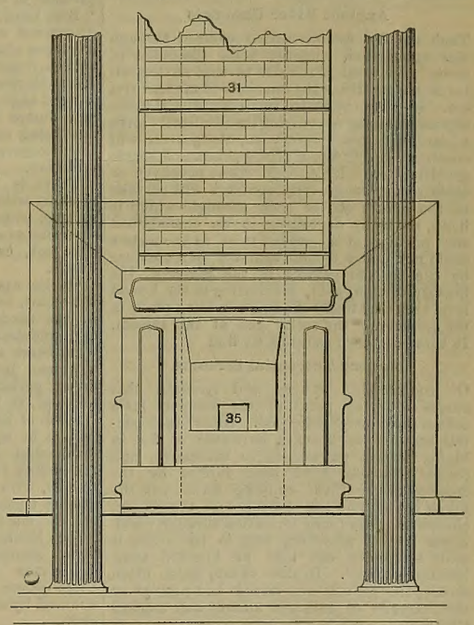
The Reverberatory Furnace.

Cuts on this page show side and front elevation of a reverberatory furnace, which are presented in order to give with them a set of technical terms applicable to this type of furnace. A glossary of furnace terms has been prepared by Prof. Thos. Egleston of New York. The proper names for the different parts of this furnace may be learned by reference to the figures on the cuts, and the following list: 1—ash-pit; 2—ash-pit doors; 3—grate-bar bearers; 4—grate bars; 5—fireplace or chamber; 6—stock-hole door-frame; 7—stock-hole door; 8—slide for stock-hole door; 9—door counter weight; 10—counter-weight support; 11—combustion chamber; 12—fire bridge; 13—fire-bridge wall; 14—air-chill; 15—water-chill; 16—working or charging door; 17—working hole; 18—frame of working door; 19—water-cooled sill; 20—laboratory, kitchen, pot, hearth; 21—fore plate; 22—cinder tap; 23—bottom plate; 24—beam for bottom plate; 25—hearth; 26—balance for charging-door; 27 flue or neck bridge; 28—flue or neck; 29—roof or arch of the furnace; 30—flue roof; 31—chimney or up-take; 32—outside plates; 33—bearers, anchor bars; 34—ties; 35—cinder tap.

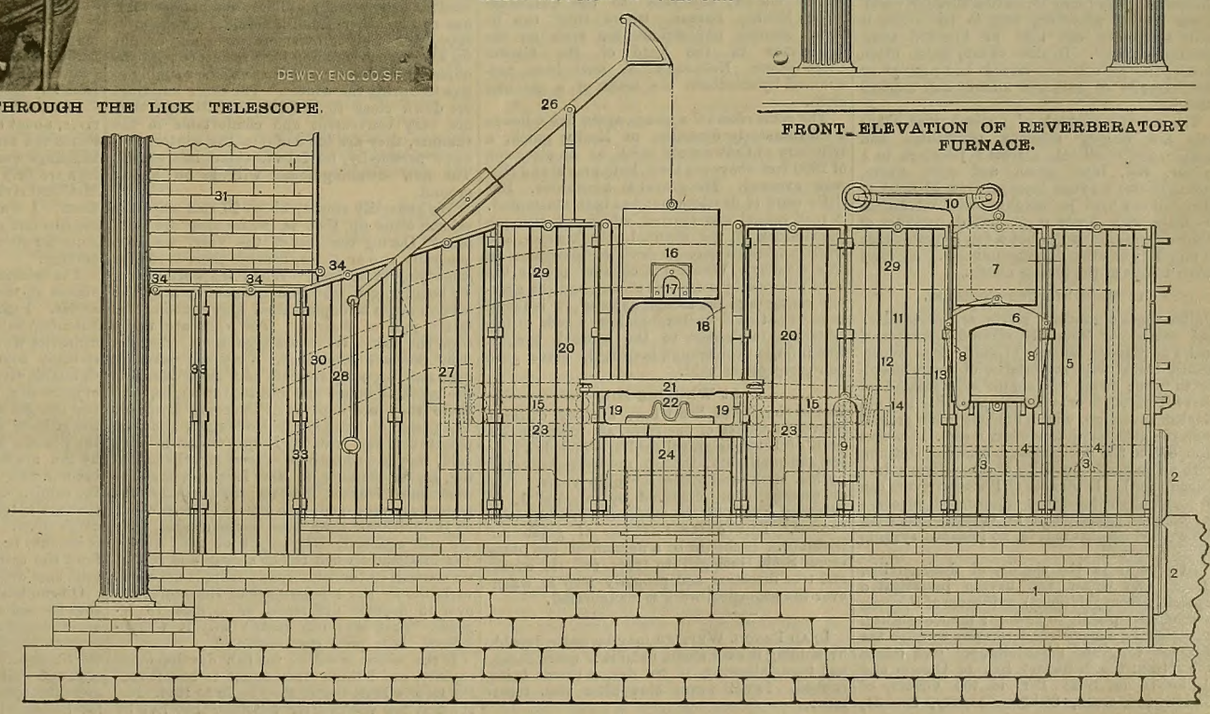
COINAGE FOR A YEAR.—During the fiscal year now closing 1,114,-160.69 ounces of gold—648,839.50 ounces fine and 465,325.19 ounces crude—were received at the United States Mint in this city. The amount of coin turned out during the present year was $23,733,955.40, and during 1888, $25,701,-284 80. The denominations were as follows: Half-eagles, $4500; eagles, $5,907,000; double eagles, $17,447,000; dollars, $108,000; quarter dollars, $112,000; dimes, $155,455.40.

THE azocerite or mineral wax deposits of Utah are located on the Uintah Reservation and can only be worked by permission of Congress. When the discovery was first reported there was a great rush to the deposits, it being supposed that they were outside the reservation, but the soldiers soon convinced the miners of their mistake.

ENGLISH capitalists are talking of buying the Los Angeles electric road.



FRONT ELEVATION OF REVERBERATORY FURNACE.



SIDE ELEVATION OF A REVERBERATORY FURNACE.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Northern Counties of California.

NUMBER 5.

The Pliocene Channels.

[Written for the PRESS by J. H. CROSSMAN.]

The mode of occurrence and system of working the gravel deposits of the Klamath river and its tributary streams was briefly described in the PRESS of the 22d of June. No reference was made, however, to the virgin and as yet undeveloped system of the immense deposits of auriferous gravels in the dead or ancient river channels that course through the northern counties of our State. Of the existence of this detritus and the lava covered Pliocene river channels there is abundant evidence. That the system has been extensive there can be no doubt, but so changed and modified by dynamic disturbances and superficial influences that it is with great difficulty that their course and grade can be accurately determined. It should be the duty of our State Engineer, as well as our State Mineralogist, to ascertain these facts and have these important sources of auriferous wealth carefully investigated, thoroughly examined and noted on a geological map of this region. The U. S. Geological Survey of Major Powell, in 1883 and 1885, by his able corps of assistants, Henry Gannett, chief geographer, Alf. Thompson, geographer in charge, topography and triangulation by Mark B. Kerr, has done much in furtherance of this object. But the geological, mineralogical and stratigraphical features were not sufficiently defined and designated to be of but little benefit to the practical miner. No mention has been made of these important auxiliaries of wealth—this system of Pliocene channels that have at some remote time coursed southerly through these northern counties and added so largely to the auriferous product of the middle and southern portion of our State.

There exists unmistakable evidence of the existence of a system of

Ancient River Channels

That at some remote period coursed through this region, their contents being dissimilar in every important particular to that of the alluvial matter filling the channels of modern rivers. In illustration in the case of a modern stream bisecting or coursing longitudinally with a granitic bedrock formation, its gravels will consist of granitic bowlders, pebbles and coarse granitic sand. If through slate, porphyry or other rocks, the gravelly contents will partake of the nature of the rock through which it flows, naturally depositing in its channel-bed such portions of the eroded mass as the waters could not easily move, regulated in a measure by the specific gravity of the material, the heavier portion, gold, gravitating to the lowest level and eventually finding a resting-place in the crevices of the rocky bed of the stream. In these northern counties we find

Modern Torrential Streams

Of considerable volume and strength that course to every point of the compass from causes previously described. Rivers that contain terraces or benches hundreds of feet in hight, terrace on terrace as successive, and deeper channels, have been formed by the erosive action of the running water, yet the filling is the same and partakes of the general character of the rocky formation through which it has flowed, providing that in its course it shall not have cut into or bisected some Pliocene channel. In that event, which often occurs, the gravels are mixed and partake of the character of both the ancient and modern streams.

The gravelly contents of ancient river channels are largely silicious, crystalline and opaque, and of all colors, from a jet-black to a yellow, red, blue, green and pure white, quartz in size varying from an atom of sand to pieces many tons in weight. The interstices are filled with finely comminuted particles of silicious material with but a small percentage of aluminia or other foreign mineral. At least seven-tenths of the mass is quartz.

Its Metalliferous Contents,

Unlike those of modern rivers, are dissimilar, and consist of smoothly washed particles of scales or rounded nuggets of gold, often superficially black, with the interior of a color peculiar to itself; owing to a copper alloy instead of silver it partakes of a brassy hue, like the old English sovereign, with a fineness much greater than the gold found in modern rivers. It ranges from 875 to 950 fine platinum osmium iridium, with an unusual quantity of titaniferous iron (black sand). Evidences of Pliocene rivers can be found at the following enumerated places—in Siskiyou county and in Oregon—but with little developments and in no instance systematically worked.

At a point in the vicinity of Jacksonville, Oregon (the writer not having investigated northerly from this point), evidences of Pliocene channels are plainly to be seen; thence southerly, following a sandstone formation through the Siskiyou range of mountains, we find (three miles from the boundary line of Oregon and California, on Soda Bar, in the vicinity of Cottonwood creek, Siskiyou county, Sec. 34, Tp. 48, R. 27 W., at an elevation of 3050 feet above the level of the sea) Pliocene gravel with Pliocene gold. There are also its accompanying metals and minerals in paying quantities on the rimrock of what was undoubtedly the bed of an ancient river channel of considerable width and volume. This ancient river had cut its way through a heavy bed of sandstone, whose elevation above its granitic bed was 3350 feet.

This Gravel Deposit

Or river channel was discovered by Mr. W. H. Smith, who commenced to develop it by an open cut, following the gravel in a course which proved on development to be at right angles with the trend of the river; the gravel bank commencing at 20 feet deepened to 58 feet, which he removed by hydraulic. The rimrock pitched into the channel at an angle of 12 degrees. He soon ran out of grade and was forced to run over the rich gravel that lay on the bedrock, having no machinery to sink. He then extended his cut for a distance of 250 feet farther and sunk a shaft to a depth of 45 feet, encountering a stiff blue clay which he penetrated to a further depth of five feet. This clay was found to be rich in the fossiliferous

Remains of Mammoths,

Such as the mastodon and other species from the early geological epochs. Mr. Smith's museum at Henly, over which the madame presides, is well supplied with specimens of the remains of these antediluvian monsters. To all appearances these brutes had visited the marshes and morasses of these Pliocene rivers to slake their thirst and bathe in the cool waters. At the time of the unusual Plutonic disturbance and lava flow, previously described, they mired down in the muddy bottoms or were engulfed in the treacherous quicksand of the stream.

Work on this mine was suspended, owing to want of machinery to handle the increasing flow of water, and to date has not been resumed.

Thence following the apparent course of this river in a southeasterly direction for about six miles to a point where Rancheria gulch intersects the Klamath river on its westerly bank, on an elevation of 300 feet above the river-bed and 2200 feet above sea level, is another claim. Mr. C. R. Jillson, who has had many years experience in this class of mining on the so-called "Blue Lead" of Sierra and Nevada counties, discovered evidences that satisfied him of the existence of a dead river channel, made his locations, and commenced operations. The Klamath river had cut through the channel at a right angle, affording facilities for both adits and dumps for the debris. This channel is now being exploited, water rights secured, and the ditches and flumes are in process of construction.

There is blue gravel and the bedrock is pitching with rich prospects. The formation through which this channel has cut its way is the same as at Soda Bar (sandstone); elevation, 2825 feet, carrying large quantities of marine fossils.

On the east bank of the Klamath, opposite this point, some very interesting fossils are seen in the sandstone. The species are unknown and undetermined, and there are imprints of what bears a close resemblance to the track of a human being. Primeval man of the quaternary period must have been of gigantic proportions, if his stature was in comparison to the size of his foot and stride. Man or beast, he was in keeping with the other mammoth mammalian species found at Soda springs, as the largest track measured 20 inches from toe to heel, with a ten-foot stride. Some casts of smaller tracks with a six-foot stride were taken in plaster, and sent to the California State Mining Bureau, where they can be seen. Similar impressions are seen on the sandstones in the yard of the Carson State prison, Nevada, which have been pronounced by scientists the track of a gigantic sloth.

The same channel appears again five miles in a southeasterly direction on Rocky gulch, a tributary of Cottonwood creek, at an elevation of 2950 feet above sea level, both gravel and rimrock exposed. The gravel is auriferous. But little work of development has been attempted. A rock tunnel was started, which cut through the rimrock of the channel, struck water, and work suspended here as well as elsewhere in this vicinity. Where the channel proper has been bisected by a modern stream and the gravelly contents of the trough exposed, it is found to have cut its way through heavy beds of fossiliferous sandstones to the bedrock proper. The filling of the trough invariably gives good pan prospects of gold.

At Whiteing Hill,

In the vicinity of Scott Bar, a short distance above the mouth of the river, an immense deposit of Pliocene gravel occurs, which has been worked profitably, though not systematically, by Mr. Hicks and others for many years. It is at present being operated by Messrs. J. O. Whitney & Co., by the hydraulic process, with success. This channel is one of great importance. It should be a portion of the duty of our State Geologist to trace out its course and true direction and properly map it whenever the geological work is inaugurated.

LEAD-PENCIL WRITING may be made durable by holding it over steam until it is quite damp, and then allowing it to dry without being rubbed. It will never blur after that treatment.

Salmon-Hatching on the Pacific Coast.

Learning that the veteran pisciculturist, Livingston Stone, was in San Francisco, we recently sought an interview with him and secured the following interesting narrative:

My attention was first called to the U. S. Fishery Commission in the spring of 1866, 23 years ago, and that fall I started the Cold Spring Trout Farm in New Hampshire. I was the first one who engaged in fish breeding in New England, and the second in the country, the other being Seth Green. Then I carried on the Cold Spring Trout Farm for several years in Charlestown. In 1872 was invited by Prof. Baird of the U. S. Fish Commission to come out to California to select places for breeding salmon. It was the first attempt in the U. S. at breeding salmon. Thus I became connected with U. S. Commission in 1872. In the fall of 1872 I made the location on the McCloud river, California, in August. It was selected for a great many reasons which combined to make it a good place, and subsequent events have proved it to be the very best place in California for the purpose. We are very fortunate in that respect. The first year, 1872, we only got about 30,000 eggs, and they were sent to the East to hatch and they secured about 10,000 breeding salmon out of those eggs. These were the first California salmon ever introduced into tributaries of the Atlantic ocean.

That experiment demonstrated the possibility of getting salmon eggs here in California and of getting them across the continent into the Atlantic ocean. The next year we went to taking salmon on a larger scale. In 1873 we got 2,000,000 eggs, and our experience enabled us to adopt better methods in every way. The next year we got 5,000,000 eggs. They all were sent to the Atlantic side to be hatched, and so we went on from year to year until one year we got as many as 14,000,000.

About that time, which was about 1875 or 1876, we began to hatch eggs in the Sacramento river, and we have kept this up ever since. In 1872 we had buildings put up, and every year after that we have made improvements and additions. It is singular that the hatching of the salmon for the Sacramento river increased the salmon very much indeed, but that the salmon we sent to the rivers of the Atlantic Coast were never heard of again. We never knew where they went to. It was very remarkable and very discouraging. When it was found that the salmon we sent to the Atlantic Coast disappeared entirely, the Commission gave up the plan of sending these salmon to the Atlantic, and decided for the future to hatch all the salmon for the benefit of the Sacramento river, and this is being done now. We do not send any salmon East except for some experiment.

When we first went to the McCloud River station there were no white people at all and no settlement, and the Indians were very hostile and did everything that they could to prevent us from settling on the McCloud river. In fact, we were the first white people that ever settled there. They tried to drive us away, but they learned that the white people were too strong for them. We built hatching-house and a mess-house for the employes and quite a large dwelling-house, and one or two other small buildings. When the great flood of 1881 came, it carried away all the buildings. In the summer of 1881, we went to work again and rebuilt the station, and then we put up a mess-house and a large and convenient hatching-house, stable and a building that was used for the postoffice. Since that time we have put up an engine-house and another building that is used for a store and postoffice; and besides that, one or two other small buildings, blacksmith-shop, etc. This summer we are going to put up a very good building for a residence with the object of having a place that will be suitable to live in during the winter. The other buildings are down close to the river. Although they are very convenient and comfortable in the summer, they are too damp in the winter, as I know personally, for I lived there last winter. The new dwelling-house will be on higher ground.

We generally employ about 20 men when the salmon come up, that is, while they are running. During the rest of the year, we keep generally two or three, because there is always something to be done. When the work is over we begin to get ready for the next year. The salmon begin to deposit their spawn about the latter part of August. The eggs are taken from the fish. When the eggs come from the fish, they are like shot. They are taken in pans and properly treated, and then taken to the hatching-house and put into troughs, and there they are kept until they are hatched. The period of hatching depends upon the temperature of the water. If the water is very cold, they are sometimes several months hatching, as, for instance, in New England, they are sometimes four or five months because the water gets very cold; it is almost ice-water, but on the McCloud river, even at the coldest, they are not generally over eight or nine weeks. The McCloud river is fed by springs and retains its warmth in the winter, and there is not much variation in the temperature of the water, not over 15 degrees difference, or at most 18 degrees. That was one reason why it was selected. It is quite remarkable.

If the water is warm, the fish develop quite rapidly, and I think they ought to be put into the river a little before they begin to feed. For the first few weeks after hatching they live by absorption of the sac, which is attached to their bodies when hatched, upon which they live for several weeks. This is called the yolk sac. They are from 1¼ to 1½ inches in length when they are ready to go out. In placing them in the river, we generally try to scatter them as much as possible. If we put them all in together, their enemies would all gather around that spot, and they would fall an easy prey, and the young salmon would not have food enough. We carry them up and down the river and adopt several means to scatter them. The big fish would get the whole of them if we did not.

I have always been in favor of putting the fish into the river before the yolk sac is gone, because then they do not have to come out to feed. When they come out their enemies discover them and the trout and everything is after them, and they are more likely to get destroyed. But if you put them into the water before they have begun to feed, they dive right down and hide, and they can stay there as long as they please. They get used to their surroundings, and the places, and everything, and are more likely to get along better afterward.

The expense has always been borne by the United States Government, but of late years the California Fish Commission has contributed toward the hatching of the salmon, and putting them into the river. The State has a hatching station up at Sissons. We send quite a large quantity of eggs up there after they are taken. We sent over 3,000,000 to the State station and they hatched them. The California station spent nearly $9000. That was for putting the station in repair, catching salmon, taking the eggs, and that includes taking the eggs from two runs of salmon.

We never took any eggs from the fall run of salmon until this year. The eggs have always been taken from the summer run before this, that is, the run that comes up in September. We continue taking nearly through the month of September. This last year we took eggs from the fall run of salmon which come up in November and got a great many eggs. They did just as well and of course we got more eggs on account of it, but it was double the expense. Instead of closing up the station as we usually do in October, we kept it running until March. We shall take both runs hereafter. Sometimes the water will be too high in the fall, but whenever we can get the eggs they will be taken in the fall.

The supply of salmon can be kept up if they will only give us laws to protect enough salmon to come up. It is very important to pass State laws. The last Legislature did about right on that subject. I think they passed almost all the laws necessary except that they did not make the close season quite long enough, but I am not quite sure about that. They enforce the laws pretty well in California, and the fishermen will understand after awhile that it is for their interest. We do not care much how they catch them if they will only let enough salmon come up so that we can get the eggs. There are various ways of catching salmon. They are caught with gill nets mostly on this coast, but also with weirs, traps, pounds, wheels and sweepseines. That is about everything. I do not know which is the most destructive to the small fish, but think the wheels take the most small fish. If the small fish went up they would all die. So there is really no great objection to catching the small fish. The wheels are usually put a good distance up the river and perhaps all the fish that get up as far as these wheels are would never come back any way. I do not see much difference between one way of taking fish and another. One is about as bad as another.

The supply of salmon can be increased very much indeed. Nearly 5,000,000 fish were turned loose from the McCloud station last year into the Sacramento river. The fish came from our station originally.

The station in Oregon is on the Clackamas river, about six miles above the mouth. I selected the station there in 1877. The necessary buildings were put up in that year. The buildings are very much better than they are on the McCloud river. They have nice grounds around them. I was at the McCloud station four months last year and then went to the Clackamas for about a month and to Alaska for three months.

The salmon are diminishing every year in almost all the rivers where there are any canneries. I think if it were not for the artificial hatching, salmon would become extinct and the canneries would have to be closed. There are so many boats out when you look down the Columbia river it is like looking at the flakes of snow in a snowstorm. It is a wonder that any fish get up there at all. If they get past the gillnets they have to run the gantlet of the pounds, etc. So if something is not done by the artificial hatching they would almost become extinct. The increase or decrease of the salmon depends entirely upon the amount that are hatched and the number of people that catch them. The sole cause of their decrease is because they are all caught. If you could limit the catching of the fish, nature would take care of it.

Oregon has one station. The State assists that the same as California does. The Government furnishes all the eggs and hatches quite a number the first part of the season, and then the State comes in the winter and hatches the eggs and distributes them. The Government appropriation for the Oregon station is $10,000 for building it and $5,000 for operating it. The

$10,000 is a special appropriation for building and getting the place in order. They only acquired the place this last year. The annual appropriation will be $5000. About 4,000,000 were hatched there. We took 5,000,000 eggs. If we get 4,700,000 fish we shall consider it a good average. One cannery in a single day on the Columbia river cuts up and cans fish that would create 20,000,000 eggs. If we could only have one day's salmon, we could hatch so many that it would be impossible for them to catch them all afterward.

There are eight canneries on the Sacramento river, 30 on the Columbia, 3 on the Siuslaw river, 1 on Smith river, Cal, 1 on Eel river, Cal., 1 on Rogue river, Oregon, 2 on the Umpqua river, Oregon.

The Legislature of Oregon passed just the laws we wanted right through. In the Senate the vote was unanimous and in the House only five or six dissenting votes, but Governor Pennoyer vetoed the whole thing. The Fish Commissioners were Republicans and the Governor was Democratic. He said that he did it to pay back the Fish Commissioners for what they did for him. Political reasons were at the bottom of it. It is going to set back the salmon culture in Oregon two years. The next Legislature will surely correct it. It was a great disappointment. They passed laws that would enable us to take 20,000,000 eggs at that hatchery, and now it will be with great difficulty that we can get 15,000,000. We have to keep two watchmen there all the time.

The Columbia river salmon are larger and grow more rapidly than those in the Sacramento, and they are better fish for some reason. There is no known cause except that it is a larger river. The larger the river, the bigger the salmon. On the Columbia river, I have known salmon to weigh 93 pounds; the largest salmon on the Sacramento weigh about 50 pounds. One station is not sufficient for Oregon. There should be two other stations just as large as the Clackamas. We have never found any other station like the Clackamas, and the only two places that we know of on the Pacific Coast are the Clackamas and McCloud rivers. Now that railroads are building and running across the headwaters, they may come across others. The sooner they go about building stations the better. There should be about three stations just as large as the Clackamas. One station is enough for the Sacramento river, and even if they wanted more we would not know where to find them.

I expect to leave for Alaska immediately in company with Dr. Bean, the scientist of the expedition, the ichthyologist. He studies up the scientific part of the work and I attend to the fish culture part. We will visit the Kodiak Islands first. When we get there we shall go up a little river called the Karluc. The island is about 100 miles long and about 50 miles wide. We shall make quite a study of the river. It is navigable. There are a good many canneries there, and there are more conveniences for study than anywhere else. Then we shall charter a vessel and go up into Cook's Inlet; will take a tent and camp. We will be gone three or four months, and we expect four to make the party. There will be one man to draw maps and charts, so as to locate all the places we describe. We will examine all the available streams, with a view to establishing Government stations, and will examine everything we can get at. This order to examine these streams was the result of a resolution passed by the last session of Congress to make an investigation of the fisheries of Alaska, with a view of improving them if necessary. A station may not be established at either of these places. We shall not start one until we get a good place. It may be a year and perhaps longer. This year we shall barely have time to get around and look. There are streams up there fed like the McCloud river by springs, so that they will be warm enough.

The further north you go, the larger the fish. On the Yukon river, they catch salmon that weigh 100 pounds. They are immense. This river empties into the Behring sea. It will be more difficult to conduct a station up there because it is so inaccessible. So many unexpected things come up when running a salmon station that a place with which communication can be had only once or twice a month will not answer. The Government is going to give a good deal more attention to Alaska. They have not begun to decrease the Alaska fish and the Government wants to get up there before the people do, to be beforehand instead of behindhand, and can then do its work unrestricted. Laws will not be necessary in Alaska at present. There is plenty of fish and plenty of room. The only people there are the cannery men, and they want the supply kept up. The development of the industry is practically unlimited. There are 20 canneries in Alaska at the present time. I think there is a Fish Commission in Washington Territory, but they have not done much. There are nine canneries in Washington Territory.

COUNTRY AND CITY LUNGS.—A few days ago a New York specialist in pathology showed the writer two bottles. One contained a section of a healthy lung of a man who had lived in the country, and the other the lung of a man who had lived and died in New York. The country lung showed a clear pink color; the city lung was almost black, and it was impossible to trace the veins through the smut and dirt.—*Hartford Courant.*

Local Industries.

Mechanical and Manufacturing Interests.

The following statistics of the mechanical and manufacturing industries of the city and county of San Francisco for the fiscal year ending June 30, 1889, have been prepared by Assessor James Nealon:

Agricultural implement manufactories, 3; men employed, 115; value of manufactures, $175,000.

Artificial stone manufactories, 20; men employed, 140; value of manufactures, $700,000.

Axle-grease manufactories, 3; men and boys employed, 15; resin consumed annually, 2000 barrels; fat consumed annually, 40,500 pounds; value of manufactures, $75,000.

Bag manufactories, 3; men, women and boys employed, 150; bags manufactured annually, 13,000,000; value of manufactures, $650,000.

Barrel manufactories, 26; men and boys employed, 575; barrels, half-barrels and kegs made annually, 1,600,000; horse-power of engines, 115; barrels made for sugar refineries, 800,000; syrup kegs made by tub and pail factories, 30,000; aggregate value of manufactures, $1,250,000.

Bed-spring manufactories, 13; men and boys employed, 260; value of manufactures, $750,000.

Bellows manufactories, 3; men and boys employed, 6; bellows manufactured, 1500; value of manufactures, $9000.

Belting manufactories, 5; men employed, 60; value of manufactures, $275,000.

Billiard-table manufactories, 4; men and boys employed, 75; billiard-tables made annually, 500; value of manufactures, $90,000.

Boot, shoe and slipper manufactories, 162; men, women and boys (white) employed, 1500; Chinese, 1800; value of manufactures, $5,000,000.

Box manufactories (cigar), 4; men, women and boys employed, 375; number of boxes made annually, 3,500,000; value of manufactures, $410,000.

Box manufactories (paper), 6; men, boys and women employed, 100; value of manufactures, $130 000.

Box manufactories (wooden), 7; men and boys employed, 400; horse-power of engines, 360; lumber used annually, 19 000,000 feet; value of manufactures, $1,000,000.

Brass foundries—Men and boys employed, 310; value of manufactures, $475 000.

Breweries, 24; men employed 700; hops consumed annually, 1,150,000 pounds; barley, 55,640 tons; beer manufactured, 641 990 barrels; aggregate value of product, $3,950,000.

Broom manufactories, 8; men and boys employed, 65; value of manufactures, $125,000.

Brush manufactories, 4; men and boys employed, 50; value of manufactures, $75 000.

Candle manufactories, 2; men and boys employed, 150; candles manufactured, 125,000 boxes; value of manufactures, $250,000.

Carriage and locomotive car-spring factory, 1; men and boys employed, 12; springs made annually, 75 tons; value of manufactures, $27,000.

Carriage and wagon manufactories, 48; men and boys employed, 500; carriages and wagons made annually, 1700; aggregate value of manufactures, $1,200,000.

Chemical works, 5; men and boys employed, 35; nitrate soda used, 350 tons; sulphur soda used, 1000 tons; nitric acid produced, 245,000 pounds; value of manufactures, $165,000.

Cigar manufactories, 260; men, women and boys employed (about 425 white men), 4500; cigars manufactured annually, 162,600,000; cigarettes manufactured annually, 55,000,000; value of manufactures, $6,900 000.

Clothing manufactories—Men, women and boys employed, 2500; value of manufactures, including overalls, suits and underwear, $6,000,000.

Coffee, spice and yeast powder factories, 13; men and boys employed, 150; coffee ground and roasted annually, 8,000,000 pounds; chocolate made, 500,000 pounds; spices and yeast powder, 1,400,000 pounds; value of manufactures, $2,000,000.

Coffin manufactories—Men and boys employed, 30; value of manufactures, $100,000.

Coppersmiths, 6; men employed, 23; value of manufactures, $120,000.

Cordage and rope factory, 1; men and boys employed, 200; hemp rope manufactured, 3500 tons; horse-power of engines, 250; value of manufactures, $700,000.

Cracker manufactories, 3; men and boys employed, 250; horse-power of engines, 100; value of manufactures, $950,000.

Cream tartar works, 1; men employed, 10; cream tartar made annually, 300 tons; value of manufactures, $90,000.

Cutlery manufactories; men employed, 25; value of product, $55,000.

Dry-docks (floating), 2; men employed, 45; capacity of docks, first, 4400 tons; second, 2000 tons; total, 6400 tons.

Dry-docks (stone), 1; length of excavation in solid rock, 450 feet; width of top, 120 feet; depth, 30 feet; width of entrance, 90 feet; capacity of length, 425 feet; capacity of drawing, 22 feet; capacity of pumps for clearing per hour, 325,368 cubic feet; tubular boilers of 4-inch tubes, 4; dimensions of each boiler, diameter 25 inches; fire surface of boilers, 3800 square feet; men employed, 8; total cost of work, $675,500.

Electric machinery works, 1; men employed, 35; value of manufactures, $15,000.

Elevator manufactories, 5; men employed, 35; elevators made annually, 50; value of manufactures, $25,000.

Flour and feed mills, 17; men and boys employed, 375; flour made annually, 410,000 barrels; hominy made annually, 300 tons; buckwheat and rye flour, 650 tons; oatmeal and groats, 3000 tons; cornmeal and farina, 1800 tons; feed barley, 18,750 tons; cracked wheat, 950 tons; split peas, 250 tons; cracked corn, 1600 tons; ground feed, 8500 tons; pearl barley, 355 tons; graham flour, 5500 barrels; aggregate value of manufactures, $3,950,000.

Foundries, machine shops, boiler and iron works, 40; men and boys employed, 4375; pig iron consumed annually, 14,650 tons; bar iron consumed annually, 16,000 tons; rivets used, 600 tons; horse-power of engines, 2600; aggregate value of manufactures, $7,000,000.

Fringe manufactories, 6; men and women employed, 150; value of manufactures, $400,000.

Fruit-preserving factories, 9; men and women employed, 100; fruit and meats put up annually, 2,000,000 dozen cans; aggregate value of manufactures, $3 250,000.

Fur manufactories, 6; men and women employed, 150; value of manufactures, $320,000.

Furniture manufactories, 19; men and boys employed, 840; lumber used annually, 9,000,000 feet; value of manufactures, $1,250,000.

Fireworks, 1; men and boys employed, 10; value of manufactures, $35,000.

Gas works, 2; men employed, 520; value of manufactures, $12,000,000.

Glass staining, cutting and bending works, 3; men and boys employed, 60; value of product, $900,000.

Glass works, 1; men and boys employed, 120; furnaces, 1; pots, 8; aggregate value of manufactures, $350,000.

Glove manufactories, 2; men and girls employed, 750; value of manufactures, $710,000.

Glue manufactories, 2; men and boys employed. 30, glue made annually, 375 tons; neats-foot oil made annually, 25,000 gallons; value of manufactures, $120,000.

Gutta percha and rubber factories, 2; men employed, 6; sets of machinery, 2; value of manufactures, $20,000.

Hat and cap manufactories, 6; men and women employed, 150; value of manufactures, $450,000.

Harness manufactories, 51; men employed, 500; value of manufactures, $1,335,000.

Ice manufactories, 1; men employed, 5; tons made annually, 3500; capital invested, $10,000; value of manufactures, $14,000.

Ink and mucilage manufactories, 1; men employed, 15; value of product, $36,000.

Japanning and galvanizing factories, 4; men and boys employed, 25; value of manufactures, $200,000.

Jewelry manufactories, 16; men employed, 160; value of manufactures, $1,000,000.

Laundries, white, 106; men, women and boys employed, 1050.

Laundries, Chinese, 301; men employed, 2700.

Last manufactories—Men employed, 15; lasts made annually, 18,500; value of product, $18,000.

Lead pipe and shot factory, 1; men employed, 30; lead pipe and shot made annually, 2500 tons; horse-power of engines, 100; value of product, $330,000.

Linseed-oil works, 2; men employed, 65; oil cake manufactured annually, 5500 tons; product of works, 1,335,000 gallons; value of oil, $875,000; value of cake, $100,000.

Macaroni and vermicelli factories, 7; men and boys employed, 60; macaroni and paste made annually, 140,000 boxes; flour used annually, 8500 barrels; value of product, $122,000.

Malt-houses, —; men employed, 125; grain malted annually, 32,400 tons; value of manufactures, $3,800,000.

Marble works, 30; men employed, 125; value of product, $275,000.

Match factory, 1; men and boys employed, 85; matches made annually, 2,200,000 gross; value of manufactures, $55,000.

Mirror manufactories, 3; men employed, 40; number of square feet made annually, 100,000; value of product, $200,000.

Musical-instrument manufactories, 19; men and boys employed, 80; number of pianos and organs made annually, 500; value of manufactures, $150,000.

Oakum manufactories, 13; bales made annually, 8500; value of product, $30,000.

Oil-cloth manufactory, 1; men and boys employed, 20; value of manufactures, $20,000.

Onyx manufactory, 1; men employed, 8; value of product, $16,000.

Potteries, 1; men employed, 20; value of manufactures, $110,000.

Provision packing factories, 5; men employed, 300; beef packed annually, 10 000 barrels; pork, 10,000 barrels; ham and bacon, 3,750,000 pounds; lard, 1,500,000 pounds; tallow, 2,000,000 pounds; value of product, $1,900,000.

Rolling-mill, 1; men employed, 800; horse-power of engines, 700; scrap-iron used annually, 15,000 tons; coal consumed, 19,000 tons; value of product, $1,300,000.

Rubber-stamp manufactories, 8; men employed, 33; value of product, $52,000.

Safe and vault works, 2; men employed, 20; bar and plate iron used annually, 40 tons; steel used, 65 tons; value of manufactures, $42,500.

Saw manufactory, 1; men employed, 40; horse-power of engine, 35; steel used annually, 1700 tons; value of manufactures, $130,000.

Shipyards, 6; men employed, 300; number of steamers, barges and other vessels built, 22; tonnage, 15,400; value of craft built, $2,765,000.

Shirt manufactories, 35; men and women employed, 2400; value of manufactures, $1,000,000.

Silverware manufactories, 3; men employed, 40; value of manufactures, $350,000.

Soap factories, 23; men employed, 275; soap made annually, 17,500,000 pounds; value of manufactures, $950,000.

Salt works, 1; men and boys employed, 40; run of stones, 7; number of tons annually, 20,000; value of product, $153,000.

Sash, door, blind and finishing factories, 2; men employed, 1550; horse-power of engines, 900; lumber used annually, 10,100,000 feet; value of manufactures, $5,000,000.

Soda-water works, 13; men employed, 130; value of product, $100,000.

Solder and babbit works, 2; men employed, 20; value of manufactures, $100,000.

Sugar refineries, 2; men employed, 900; raw sugar used, 91,000,000 pounds; white sugar made, 60,000,000 pounds; yellow sugar made, 25,000,000 pounds; syrup made, 500,000 gallons; value of manufactures, $11,000,000.

Tanneries, 23; men employed, 300; horse-power of engines, 200; bark used annually, 4500 cords; hides of all kinds, 255,000; value of manufactures, $1,450,000.

Tinware, tin box and can factories, 6; men and boys employed, 600; value of manufactures, $1,000,000.

Trunk and valise manufactories, 3; men employed, 205; value of product, $910,000.

Type foundries, 3; men employed, 50; value of manufactures, $60,000.

Vinegar and pickle factories, 6; men employed, 85; vinegar made annually, 950,000 gallons; pickles preserved, 115,000 gallons; value of manufactures, $175,000.

White-lead manufactory, 1; men employed, 50; number of tons made annually, 3000; capital invested, $250,000; value of manufactures, $361,000.

Windmill manufactories, 3; men employed, 50; number of mills and casks made annually, 500; value of manufactures, $40,000.

Wire and wire-rope manufactory, 1; men employed, 200; horse-power of engines, 360; wire consumed annually, 10,000 tons; value of manufactures, $950,000.

Wool-scouring and grading mills, 6; men employed, 175; wool scoured annually, 15,000,000 pounds; value of product, $4,500,000.

Woolen-mills, 2; men and women employed, 750; number of power looms, 180; cards set, 65; frames for knitting hosiery, 24; spindles, 17,000; blankets made annually, 50,000 pairs; hosiery made annually, 20,000 dozen; wool (clean) used annually, 1,500,000 pounds; cloth, tweed and flannel made annually, 1,000,000 yards; aggregate value of manufactures, $1,100,000.

THE VALUE OF SOAPSTONE.—One of the valuable minerals of this country of which the output is largely increasing is talc or soapstone. It is used for dressing skins, leather gloves and similar purposes, but its greatest use is as an adulterant. For this it is peculiarly fitted on account of its lightness, being employed as a filler chiefly in the manufacture of soap paper, and rubber, and to a certain extent as a lubricant with other substances. It is also used for making slate pencil, crayons, stoves, ovens, lime-kiln linings and hearths, and also, being acid proof, for sizing rollers in cotton factories. In Alabama it is used for headstones. The American aborigines used it for culinary articles, and the Chinese for the carving of their idols. Its lightness and its fibrous character admit of its almost entire incorporation (90 per cent) with paper stock, while clays and other materials which it replaces are only available to the extent of 30 or 40 per cent. It is known to commerce by such names as pulp, mineral pulp, agalite asbestine pulp and others of the same character.

FRESH BOILED WATER NECESSARY FOR A GOOD CUP OF TEA.—All tea and coffee drinkers can tell by their taste if the water from which the beverage is made has not boiled or boiled too much. Either of these conditions will spoil the flavor of the costliest tea or the best coffee berry. But not every one knows the reason or how to avoid the result. The secret is putting good fresh water into a clean kettle already warm and setting it to boil quickly, then taking it right off to use in tea, coffee, and other drinks before it is spoiled. If the water is allowed to steam and simmer and evaporate till all the good of the water is in the air and all the lime and dregs left in the kettle, you must not expect a well-flavored cup of tea or coffee.

TRANSFUSION OF BLOOD.—Count Percy N. Deduboeag of Tallula Falls, Ga., a physician of considerable repute, was called to the bedside of Mrs. S. White, lately of New York, and a very wealthy lady. Mrs. White had fallen from a cliff and sustained the loss of an immense quantity of blood. The physician, without hesitation, opened a blood-vessel in his arm and passed a large quantity of blood into a similar vessel in his patient's arm, no other physician being present. Count Deduboeag, after suffering the loss of blood, had to stop the flow in his own arm, and then administer to his patient, and before the operation was completed he almost fainted from weakness and loss of blood.

EUREKA has 13,000 feet of street railway track in use.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

LIVE OAK.—Amador *Ledger*, June 29: The Live Oak mine and mill, three miles west of Jackson, have come to a standstill. To all appearance operations have been permanently abandoned, as far as the present owners are concerned. The rock was of fine grade, but the ore body was small, and working with a two-stamp mill the expenses were too heavy. It has been in operation, with short intervals of inactivity, for about three years.

AT the Amador mine the finishing touches are being placed upon the new hoisting machinery. It is probable that the change from the old to the new machinery will be made within the next two weeks. The method of supplying the water-power to the different machinery is a novelty, at least in this county. A large 22-inch pipe brings the water from the canal. This pipe discharges into a large tank. From this tank four small pipes, about six inches in diameter, will run—one to operate the hoisting machinery, one for the air compressor, etc., running four distinct sets of machinery by one main pipe. Of course, the main pipe will carry more water than all four small pipes. The tank will always therefore be full; and it is claimed that the result will be the same as though all pipes were connected directly with the canal. The advantage is that it saves the expense of laying several long stretches of pipe. The nugget taken from the Arroyo Seco gravel mine last week weighed 5¾ ounces.

SUTTER CREEK.—There is considerable anxiety manifested here on the question of who will purchase the Mahoney mine, or whether it will be sold at all. The property has been bonded for some time; the bond expired on the 24th instant. It has been generally understood that were at least two companies willing to purchase it at a reasonable figure; the Wildman Co. and the owners of the New London.

AT the Kennedy sinking is in order in both shafts. The mill is kept running to its full capacity of 40 stamps.

DRYTOWN CON.—*Dispatch* June 29: They are down 20 feet in new sinking; the porphyry is cutting out and a ledge of ore is coming in on the footwall. In 50 feet more the shaft will be all in ore, then the ore body will be 10 feet wide.

COSMOPOLITAN.—They sunk 43 feet for the month ending the 20th, having only two men on a shift, which is very good work for two men. Mr. Allen was looking out a road so as to get in lumber for the new mill, which will be started next week by Knight & Co., the contractors.

HENRY CLAY.—The contractors are pushing this tunnel in as fast as possible; have great deal better ground this week and are making good headway; have passed through considerable quartz this week.

GINOCCHIO.—Parsons & Co. are running their Huntington mill, which is doing good work; the ore is turning out very well.

BLACK HILLS.—This company are about to sell to an English Co.; it can be made a dividend paying mine in a short time with capital.

GOVER.—Are running along steadily and are doing about the same work as of yore; will put in two more concentrators soon.

El Dorado.

MOVED OFF,—Placerville *Observer*, July 2: The so-called Rudd pulverizer and amalgamator has been moved off the Stewart mine. The promoters of this machine represented to Mr. Stewart that it would work one hundred and fifty tons of gravel per day, and that it would save every color of gold; and that it did not require more than twenty minutes to clean it up at any time. It is unfortunate that such representations should be made to mine owners for the purpose of securing leases on mines to work on royalty. This is often done by men of small means, without experience in mining, but have sufficient egotism to justify them in the belief that they can manage a mine as well as they could a patent medicine peddler's cart.

DONCASTER.—Placerville *Observer*, July 1: Fourteen tons of ore taken from Doncaster mine, Kelsey district, recently worked at the Big Tunnel company's mill at Poverty Point, yielded thirteen ounces of melted gold. This ore was taken indiscriminately across the full width of the large vein.

Inyo.

THE SODA WORKS.—Inyo *Register*, March 29: The Inyo Development Co. has expended well on to $100,000 in their efforts to build up a paying business in the manufacture of soda from the waters of Owens Lake. Until recently it still remained a matter of painful uncertainty as to whether success or disastrous failure was to be the outcome. But now we are perfectly assured, that no doubt whatever exists in this matter. It is a great success, and in time, and but a short time at that, these Owens Lake soda works will produce a greater quantity and higher grade of merchantable soda than any other works in the world. From 40 to 60 workmen are now employed, and it is quite probable five times that number will be put to work within a year, and as rapidly as added machinery and appliances will permit. Among other things in this line is the great furnace soon to be erected. B. F. Gray is in immediate charge, and to his practical knowledge of the business is due very much of this assurance of final success. It is a great enterprise and certain to be of importance to this county and section.

IDLE MINES IN ANGELS.—Angels *Monitor*, June 27: If capitalists are of the opinion that all the best mines of Angels are now in the hands of men of large means and in operation, we beg to inform them that such is not the case. There are numerous other mines in this town and its immediate vicinity that are now idle and have been for years past. We are satisfied that some of them could be bought at a reasonable figure. There are the Marshall or Winter mine, the Fritz mine, the Gold Cliff mine, the Lightner, the Crystal and the Confidence mine, all of which are, in our opinion, equal to those in operation.

STICKLE.—Improvements are going on at the Stickle mine in various ways. The gallows-frame over the shaft has been raised ten feet higher during the week, and the work of sinking the shaft several hundred feet deeper will be commenced in a few days. Work has been suspended in the stopes pending the sinking of the shaft. The chlorine works in this place is kept in operation day and night, reducing sulphurets taken from the Utica and Stickle mines. Work is going on actively at the Angels mine, and extensive improvements are being made to better develop the property. This is one of the best mines in the town.

DEEP SPRING.—Greenly & Broder are making a shipment of ore from their mine in Deep Spring Valley. The ore is very rich, running up into thousands of dollars per ton. The vein is small, but the mine is looking as well as at any former time.

WILD ROSE DISTRICT.—Inyo *Independent*, June 29: Over in Wild Rose district tailings have recently been tested that carry more silver than was got from the ore when it was milled. It is the fact all over the country that heavy loss has been caused to miners by letting the gold and silver escape in the tailings.

BORAX.—The first shipment of borax from Conn & Trudo's works in Saline Valley was made last Tuesday. The borax is of very fine quality and if the weather will permit regular shipments will be made. Many predicted that borax could not be made in Saline Valley, but Messrs. Conn & Trudo have shown that such is not the case, and they are well satisfied with their prospects.

DEATH VALLEY.—William Harrington got in last Monday from a prospecting trip of several weeks over in the Death Valley country. He found several ledges of very good-looking silver ore and brought in samples for assay. The ledges are near the line of the Salt Lake and Los Angeles railway and will be easy of access from that road.

Mariposa.

PINE TREE.—Mariposa *Gazette*, June 29: A ledge of very rich rock was struck in the Pine Tree mine at Bear Valley last Saturday. Work has been quietly progressing for some time at this mine, and we are glad that the faith of the owners has been met with success. The reputation of the Pine Tree, the Princeton, and the old Mariposa mines, in early days, would fully warrant a large force of men being put upon each, and it is to be hoped that the good luck at the Pine Tree will incite the Grant people to renewed faith and work on all the principal mines on their vast estate.

BARLEY FIELD.—Messrs. McCormick, Ridgway and Hay have struck a vein of exceedingly rich rock in their mine at the Barley Field. They had only gone down about twenty feet on their new shaft when they came on a vein about twenty-eight feet wide, which, if it continues, and there is every indication of its holding out, will prove a big bonanza. Their mine is in a locality noted for its great mineral wealth, and although much gold has been taken from the Barley Field, there is still an immense body of ore which has never been prospected. It is always cheering news to hear of good strikes being made, and we hope to be able to chronicle many more during the present year.

Mono.

QUEEN.—Inyo *Independent*, June 29: It is expected that the Queen mine, near Benton, will soon be in operation with a large force of men. The mine turned out several millions of dollars some years ago, but not much has been done there of late. Recently two men opened up a claim adjoining the Queen on the north; they are reported to have found a good body of ore. They have a tunnel much deeper than the old workings of the Queen and it is proposed to work their mine from this tunnel. No doubt is entertained that plenty of as good ore will be found as was taken from the mine formerly.

Monterey.

LOS BURROS MINES. — Cor. Salinas *Index*, June 29: Los Burros mines, or as they are more commonly called, the "Cruikshank" mines—owing to the first discoveries being made by Cruikshank—are about 60 miles from Paso Robles. They are accessible from various directions from Paso Robles. You can go by wagon to the crossing of the Nacimiento river at King's Camp, and from there a pack train furnishes horses to ride into the mines, over a trail twelve miles. You can also go from Kings City to the mines, and by steamer from San Francisco to San Simeon, where you can obtain horses, and an easy day's ride will bring you there. For two years these mines have been known, and a great deal of prospecting has been done, but until very recently no developments have been made worthy of note. The Cruikshank mine has been working continually, and a great amount of gold has been taken out, considering the poor way in which they have had to get along, having no roads by which large machinery could be brought in. They succeeded in getting a small three-stamp mill in over the mountains, and have taken out something over $90,000 in gold, but find that this process does not save enough, and have discontinued work in the mill until such time as they can get in better machinery. They are still working in the mine, however. The ore has a great average of sulphurets, and this carries gold, and must be saved, and for this it needs chlorination works. Outside the Cruikshank no mills have been put in, as the mines have been only prospected. But now several companies have been organized to work their claims. The Brewery mine has, I am informed, been sold to a San Francisco company, and works will be put up immediately. This mine has a ledge of some thirty-six inches in width, all bearing gold in large quantities, and from what is already in sight, the outcome will make its owners millionaires. The Grizzly, owned by Ballou, Fancher and others, is probably the best mine in the whole camp, showing a well-defined ledge a few feet from the surface of over 17 feet in width and rich in gold and silver throughout. An average assay of the ore of this mine gives returns of $241 to the ton. All has not yet been told. P. Gillis has a claim that bids fair to make him more fortunate than the rest, in having a running stream of water. He has washed out nuggets to the value of several hundred dollars in the gullies below the claim.

Placer.

A RICH GRAVEL MINE.—Grass Valley *Union*, June 29: The Red Point gravel mine, which is on the auriferous old river channel in the eastern portion of Placer county, is now yielding at the rate of $1000 per diem, the gravel being very rich. The Red Point mine is owned by the French syndicate which purchased the Succor Flat gravel claims near Iowa Hill, a few years ago, at an enormous figure, only to discover a few months afterward that the property was comparatively worthless, the swindle being among the worst ever perpetrated on the coast. After the failure of the Succor Flat investment the Frenchmen were recommended by John B. Hobson of Iowa Hill to purchase the Red Point ground and undertake its development, as its location was considered favorable. The syndicate had some money left from its Succor Flat purchase, and concluded to take the ground, paying $30,000 for it. During the last two years and over, a tunnel has been driven into the gravel channel, and as stated above, rich pay has finally been reached. It is possible the syndicate may be lucky enough to make up its loss of $100,000, out of which it was swindled by the Succor Flat investment.

IMPROVING. — Placer *Argus*, June 29: Mr. Chappellet writes with regard to the Live Oak mine: "Since last report the ground in prospecting drift has improved. The bedrock does not raise more than the ordinary grades of other channels, and as we are on the same level as other channels (May Flower with the rest), it is to be expected that we will find good ground just ahead of us."

Plumas.

THE SAVERCOOL.—Greenville *Bulletin*, June 29: From Alexander Cameron, who was in town Monday, we learn that he has five men at work driving the lower tunnel of the Savercool mine ahead. He expects to reach the ledge in a short time. This tunnel is now in 200 feet. The backs obtainable with the lower tunnel are 1800 feet. The development work is being done by authority of New York parties, who agree to put up sufficient money to prosecute the work for 18 months. If necessary, the drift will be put in 1500 feet. The owners have faith in the development of a big mine. They have in readiness a 40-stamp mill fully equipped for work and so situated that the ore can be delivered to it and crushed very cheaply.

Sierra.

THE BUFFALO MINE.—*Tribune*, June 28: The Buffalo G. M. Co. will not be able to do anything with their mine until the assessment, which has been levied, is paid. Then it is their intention to put in an engine and work the mine as it should be worked.

Siskiyou.

QUARTZ.—Yreka *Journal*, June 29: We were shown an exceedingly rich specimen of gold quartz last Thursday, by Mr. A. Ball, taken from the Mountain Laurel ledge, at Salmon river, in which he is interested. It is nearly as large as a man's hand, and seems to contain nearly as much gold as quartz. A ton of such rock would yield over $30,000, and was a sample of the richest taken out, lying next to the hanging wall. The Allen brothers, of Quartz Valley, have been successful lately in their quartz ledge, and expect to take out more gold this season than ever before. Mr. Boyle, who has just opened a ledge of quartz at head of north fork of Humbug creek, and built a wagon road to it, had a ton of the ore crushed last week, on trial at McCook's mill, which yielded $115. He now intends getting out plenty more quartz, believing he has discovered a bonanza of great richness and extent. There are over sixty miners at work on Humbug creek, all doing well, and the general belief now is that Humbug will become the richest mining district in the county in spite of the name given it in early days when the placer diggings, worked out to a great extent, proved so rich. There are several rich ledges on Humbug creek, such as the Siskiyou, Eliza, Mount Shasta, Cornish, Mexican, Brown Bear and others which, if properly worked by practical miners, will pay handsomely. Good quartz mines exist on the Klamath river side of the Humbug divide and on the Yreka side also. Report says the Steamboat mine at McAdams creek will be again started up under the management of J. B. Eldredge. The bed of McAdams creek contains rich deposits of auriferous gravel in great quantity, but the great difficulty is to get good drainage, requiring the constant use of powerful steam pumps.

Santa Barbara.

BEACH MINING.—San Luis Obispo *Republic*, June 27: Mr. Paschal Dallidet, of this city, is quite heavily interested in the mines of the Sierra Nevadas. Reading of the beach mining along the coast from Point Sal to Point Conception he visited the region to make an investigation of the reported mines and ascertain their value. Near Point Sal he found the miners who occasionally dig for gold in that locality. Eight years ago a rich body of black sand was found and several thousand dollars taken from it in a few months. This created quite an excitement, but difficulties in mining occurred, and with poor appliances for working them the mines were abandoned. But work will soon be resumed. The principal works Mr. Dallidet found on beach four miles south of the Santa Ynez, owned and worked by Messrs. Charles Lausser, I. Saller and W. S. McKay. These men work three large rockers, with five men to each, and usually take out $20 a day to each rocker. The result depends greatly upon the condition of the weather and the ocean, as the high waves interfere with the work. In the latter part of April these three men commenced work with one rocker and have taken out $1300 in gold dust. The dust is very fine, the flakes being scarcely discernible by the naked eye, and being associated with heavy black sand and find platinum, is very difficult to separate. The rockers used are about ten feet in length, the upper part of the washing bed having plates coated with a blanket. On these plates and in the blanket the gold is saved; also considerable platinum, the latter selling for $8 a pound. The mining is carried on very crudely, a barrel, into which water is carried by buckets, being placed over each rocker and the water being let on by a hole in the bottom and is run into a little pool from which it is baled and used again in the same manner. The auriferous black sand is found in a stratum usually found covered by common sea sand. The men being much in the water, and often washed with ocean waves, go barefooted, with pants rolled up, making their work disagreeable and endangering health. The men employed receive $2 per day and are boarded, but the proprietors of the claim propose to hire Chinamen, whom they will pay $1 per day and board themselves. Gold is found on the sand beaches from Point Sal to Point Conception, a distance of forty miles, but not always in paying quantities. There are several localities, however, where preparations are making for washing the sand.

Trinity.

EAST FORK.—Trinity *Journal*, June 22: E. Greenwell says work is progressing satisfactory on the Ozark; he is running a tunnel to tap the ledge at a lower depth. In the old tunnels and stopes there is enough ore to run the arastra all summer. The arastra has been running right along and the ore is of the same high grade as formerly. Mr. Greenwell also informs us that John Day and a prospector named Isabel have made a new strike on Rattlesnake; they have found two ledges carrying free gold.

Tulare.

RATTLESNAKE CREEK.—Tulare *Times*, June 29: The peculiar formation that is found to carry gold on Rattlesnake creek also carries a large percentage of black sand, which is reported to be worth in the market about $500 per ton. This sand can easily be saved when working the rock for the gold there is in it. It is thought that about 200 tons of rock will have to be worked to secure one ton of black sand. G. T. Nighbert sent a quantity of ore from the Rattlesnake Creek mines to San Francisco for a working test several weeks since, and the returns show that the rock will yield $5.50 per ton in gold. Selected rock from the mine gives a larger return, but Mr. Nighbert's ore was such as came from the mine naturally and without selection. He has bonded one of his claims for the sum of $3000.

Tuolumne.

A NEW MILL.—Toulumne *Independent*, June 29: At the Golden Gate mine they are grading for a 10-stamp mill, which will be erected as soon as possible. The new hoisting works work to a charm. Supt. Long will continue the shaft 100 feet deeper and says the mine looks splendid, the ore-shoot being over 600 feet in length. The work on the furnace for roasting the ore is being pushed onward.

NEVADA.

Washoe District.

HALE AND NORCROSS.—Virginia *Enterprise*, June 29: On the 400 level the stopes in the north drift from No. 1 west crosscut continue to yield the usual quantity of good ore. On the 500 level the stopes look well and are yielding the usual quantity of good ore. On the 600 level the north drift was advanced 30 feet; total length, 55 feet. Also started a drift south from No. 2 crosscut and advanced it 40 feet. This connection will greatly facilitate the extraction of ore and will improve our ventilation. From the 600 and 700 levels are extracting the usual quantity and quality of ore. During the week hoisted 752 cars of ore. Shipped to the Nevada mill 682½ tons of ore and milled 692½ tons. Average battery assay, $26.87 per ton. Have shipped $18,336 in bullion since last report.

SAVAGE.—On the 400 level the joint west crosscut was advanced 24 feet in vein material. Are extracting ore from No. 2 southwest crosscut, from the old stopes in the south drift and from the north drift. On the 500 level have started a prospecting drift north from the upraise, which is now advanced 29 feet in quartz and porphyry. Are also extracting ore from the old stopes in the south drift on this level. Have men employed at repairs and easing timbers on the different levels and in the main shaft. During the week hoisted 498 cars of ore, shipped to the Rock Point mill 471½ tons and milled 490 tons. Average battery assay, $20.27 per ton. Shipped $7014.99 in bullion since last report.

BELCHER.—The 1100 raise is up 114 feet on the slope, in about the same material as reported last week. The 1100 south lateral drift from the station has been connected with the west crosscut and a winze started 30 feet east of the ore streak in the crosscut, which is now down eight feet in porphyry, showing streaks of quartz. The 1000 south drift is out 138 feet from the station. The 1200 lateral drift is out 127 feet, and the face is in lively-looking vein material giving small assays. The 200 west crosscut is out 38 feet. The ground is becoming somewhat softer.

SILVER HILL.—The north drift on the 260 level has been advanced 20 feet through quartz and porphyry; total distance from shaft, 330 feet. The northwest drift on the 160 level has been advanced 25 feet through quartz; total distance from shaft, 415 feet. Southwest drift, 160 level, advanced 10 feet; ground very hard; total distance from shaft, 495 feet.

JUSTICE.—The north winze is down 52 feet and the bottom shows four feet in width of good ore. No change to report in the north and south stopes. The shaft is down 88 feet and the bottom is in very hard rock. Shipped to the mill during the week 223 tons of ore, the average battery samples of which was $26 a ton.

EXCHEQUER.—East crosscut, 150 feet south of the north line on the 825 level is out 44 feet; face in clay and porphyry. West crosscut, 150 level, south of north line, is out 56 feet; face in clay and quartz. North lateral drift on 500 level is out north of the Alpha shaft 581 feet; face in hard porphyry.

CROWN POINT.—The 500 raise is up 75 feet and the ground is becoming somewhat softer as they advance. The pay streak on the 13th floor south stopes, going south, looks about the same as at last report. The 300 and 400 north stopes look the same also. Shipped to the mill during the week 829 tons of ore.

POTOSI.—The south lateral drift on the 750 level is out 497 feet; face in porphyry. The south lateral drift on the 650 level is out 434 feet; face in hard porphyry. South lateral drift on the 930 level is out 768 feet south of the Chollar shaft; face in clay and porphyry.

CONFIDENCE.—The joint Confidence, Challenge and Imperial north drift on the 500 level has attained a length of 728 feet from the Yellow Jacket shaft, 29 feet having been added during the week. The face is in quartz giving low assays.

CHOLLAR.—East crosscut 150 feet south of north line on the 550 level is out 72 feet; face in low-grade quartz. The north lateral drift on the 750 level is out 326 feet; face in porphyry with streaks of quartz giving low assays.

CON. IMPERIAL.—The north drift on the 300 level is now in a distance of 188 feet from the south line of the mine, having been advanced 37 feet during the week. The face shows porphyry.

OVERMAN.—Have run the mine six days. Extracted 248 tons of ore and shipped to the Vivian mill 240 tons. At the top of the upraise from the east drift have extended the south drift 25 feet; total

length, 69 feet. Formation porphyry and quartz. Are repairing the Lambert tunnel.

NEW YORK.—The north lateral drift from the northwest crosscut on the 800 level is out 65 feet; face in clay and quartz. This drift is being run on the east side of the ledge.

ALPHA.—The 500 level east crosscut, 50 feet north of Alpha shaft is out 44 feet; face in quartz and clay of no value. The west crosscut on the south line is out 93 feet; face in clay.

SEG. BELCHER.—The 1100 raise is up 112 feet, having advanced 39 feet during the week. The top of the raise shows a streak of quartz two feet wide, which gives fair assays.

SCORPION.—On the 520 level the east drift from the Sierra Nevada shaft was advanced 55 feet during the week; face in porphyry and clay showing some water.

ALTA.—The usual work is reported from this mine and extracting the same quantity and quality of ore. The mill is running steadily.

BALTIMORE.—Are extracting ore of good grade from the crosscuts on the 225 and 338 levels. Both places are quite wet.

YELLOW JACKET.—Are shipping about 100 tons of white gold rock daily to the Brunswick mill.

BULLION.—Still drifting north in the vein in the 760 level.

Cedar District.

A MINE SOLD.—*Silver State*, July 1: M. H. Sunderland has purchased the Mohawk mine of the owners, Messrs. Frank and Ed. Clark, William Poole, Jehiel Smith and Charley Harvey. A part of the purchase money has been paid and the balance will be paid to-day. Cedar district is situated in the Antelope range, about 22 miles from Humboldt House.

Central District.

GOOD RESULTS.—*Silver State*, July 1: J. F. Clark & Co. are working the Aurum mine. They shipped a car-load of ore from it to the Reno Reduction Works recently, one lot of which yielded $331 in gold and $81 in silver to the ton, and another lot $200 in gold and $38 in silver to the ton.

Ely District.

DRY PROCESS.—White Pine *News*, June 29: A nice little bar of bullion, the product of twenty-four tons, and valued at $500, was shipped by the Ely Gold Mining and Milling Company this week. The ore was worked by the dry process and gave the best result yet attained—$19 per ton out of a pulp assay of $22. Could this average be kept up the property can be worked to a good profit.

San Diego.

HELVETIA.—Julian *Sentinel*, June 29: The old Helvetia mine, lately purchased and now worked by Smith & Murray, is being pushed forward. These gentlemen are driving a tunnel from a canyon about 350 feet west of the old works, in on the ledge to the stoping-ground west of the old air shaft. They are now in 85 feet and have had pay ore from the beginning, but in the last few days have struck a splendid body of quartz, some of it showing free gold and all of it prospecting well. A stamp-mill is a necessity in the near future and will be put up before beginning work on an extended scale. The engine on their mill-site, which runs a ten-stamp mill and pounded out thousands of dollars for the old owners of the mine, will be taken and used for hoisting purposes.

Tuscarora District.

BELLE ISLE.—*Times Review*, June 29: West crosscut from the end of north drift, 250-foot level, extended 19 feet.

COMMONWEALTH.—East intermediate drift, from No. 14 chute, advanced 17 feet; has 15 feet farther to be run before reaching the ore opened up by No. 8 drift. North intermediate from east lateral winze extended 10 feet, exposing fine ore. South intermediate, extended 9 feet, developing a fine large body of ore. North drift from No. 1 winze, advanced 13 feet; total 90 feet, showing good ore the entire distance. West intermediate drift from No. 11 raise, advanced 32 feet, showing good ore. There is but little change in the stopes. North of the shaft, a greater length of stopes is being made. The ore is high-grade. South stopes, the yield and quality is fully as good as heretofore; 228 tons have been sent to mill. Battery pulp assay $130.33. Bullion shipped, $13,127.50 and $12,396.34. Mine and mill are both running well.

NEVADA QUEEN.—Winze from the 450-foot level has been sunk 10 feet. Total 46 feet. The ore has been very regular, assaying $180 per ton. Crosscut on 350-foot level has been advanced nine feet; quite a flow of water has been encountered. South drift from the 150-foot level of Commonwealth advanced seven feet. Small seams of very high-grade ore have been showing in the face, and is looking very favorable.

DEL MONTE.—East crosscut from north drift, 100-foot level, extended 11 feet. An upraise was started 10 feet from the face and carried up eight feet, cutting into high-grade ore.

NORTH COMMONWEALTH.—No. 1 upraise from east crosscut, 100-foot level, extended five feet and discontinued for the present, and the crosscut has been started ahead and advanced ten feet.

GRAND PRIZE.—The stopes are looking and yielding well. Concentrator is nearing completion.

NAVAJO.—West crosscut No. 3 from the end of south drift, 350-foot level, extended 19 feet.

ARIZONA.

SENSIBLE MINING.—Prescott *Journal-Miner*, June 29: The regular arrivals at the Prescott railroad depot of wagons heavily loaded with gold ore from the Congress mine give substantial evidence of the value of the mineral deposits of our mountains. Culver's teams have just brought in 110,000 pounds to be shipped direct to the smelting works. This is about five carloads, and as the net returns, by the carload, average over $1600, an idea may be formed of the value of this business, which not only puts money into the pockets of the owners, but gives employment direct to hundreds of people and indirectly to thousands. A couple of years ago this mine was lying dormant and neglected. It was hard work to induce any one with capital to even look at it. Many attempts were made to bring it to notice. At last Frank M. Murphy persuaded Diamond Jo Reynolds to go there and to put up the money to open it. The mine is now producing and shipping from 175 to 200 tons of first-class ore a month, which fetches from $150 to $175 per ton for the gold, and a little silver. There is no lead. The ore is a clean pyrite in quartz. It is broken out in large masses, and the second-class ore remains on the dumps. Upwards of 7,000 tons have so accumulated and the new 20-stamp mill now being erected is intended to crush and concentrate this ore and put about four tons into one. This will give a product worth upwards of $200 per ton. This method of working a gold mine is somewhat novel. Gold ores are usually too poor to ship in bulk. But in this case the average is high, and the melters return 95 per cent of the assay value. The gold might be extracted by chlorination, but the first cost of the plant, and the costs of chemicals and manipulation would carry the expenses per ton to nearly the present cost of shipping and treatment. We understand that there are large reserves in the mine, and that every appearance indicates that the property will be a large producer for years to come.

MOHAVE MINES.—*Miner*, June 29: Jno. Barry is busily engaged in putting the little mill at Cerbat in working order, and will, we understand, work custom ore. The shaft in the Crescent in the Peacock mountains will be sunk 100 feet deeper by Wm. Miller and H. W. Hitchcock. Tourtelotte and Wilkins are having another lot of gold ore run through the Flores mill. J. M. Boland and Thos. Stinson are working on a claim near Todd Basin and are taking out 1½ tons of good gold rock each day. In the C. O. D. a considerable body of rich ore has been encountered in the lower level, and the strike improves as work progresses upon it. J. J. Williams, interested in the Copper World and Antler mines, has ordered the suspension of work until next fall. Another and richer strike has been made in the Howell portion of the Prince George. The strike is said to be the best yet made in that mine. Bell and Kostar have this week been experimenting on ore from the Prince George dump by running it through a jigger, which was placed at Lake's windmill. The experiment was not as successful as was anticipated. N. C. Amer has encountered another body of high-grade ore in the Silver King, and it is the largest body yet encountered, as well as the richest.

ORE SHIPPED.—Prescott *Courier*, June 29: The quantity of ore shipped from our mines so far this month will aggregate a total of 180 tons, and about 60 tons are yet awaiting shipment at the sampling works; $15,000, net, has been paid for this ore. McCabe is bringing to the sampling works considerable quantities of ore; Foster & Robinson have some 50 tons on the road for delivery at the works. G. W. Hull and J. Dempsey have located the Monitor North Lode, Gold Pen Lode, the Great Unknown and Monitor South Lode mines in Black canyon. Fred Stull, who has been working under lease in the Hillside mine, tells us he fears that the company will give no more leases. J. E. Anderson, just from Walnut Grove district, has specimens of silver that are worth $10.47 per pound

BRITISH COLUMBIA.

THE MCMURDO DISTRICT.—Cor Donald *Truth*, June 25: Things are looking very favorable in the McMurdo camp for a good summer's work. At present Mr. McCabe is working two shifts on the Southern Cross and Monitor. The party representing the company who are about to operate on Copper creek having been well satisfied with the property, work will be commenced immediately on the Lost Chief and a crosscut tunnel run at a greater depth than the present drift. Jim White is hard at work prospecting Cariboo basin in the interest of Mr. Granger. He has got some fine specimens of what we would conclude to be a free-milling ore, although the nature of surface croppings generally changes with depth. The season in the glacier belt is about as far advanced at present as it was a month later last season, the snow having all disappeared with the exception of a few patches on top of the glaciers. A party of gentlemen from Vancouver are expected in on the beginning of next week, and if satisfied with their trip, from 20 to 30 men will likely be at work out there by the 1st of July.

TOBY CREEK.—Rosemond, Kirkpatrick & Co. have, at an expense of $500, cut a trail up Toby creek to their claims, and are now at work opening them up. If the leads prove good, and the surface showing indicates that they will, ore will be packed down to the Columbia river and shipped out for reduction. These gentlemen think that ore is worth more at reduction works than on the dump, and propose to make their claims self-developing. Capt. Armstrong of the Kootenay Mail Line has made a uniform rate for ore from any landing on the river to Golden. The rate is $1.50 a ton.

PORCUPINE CREEK.—Foreman Henderson of the Donald Co. writes from the creek to-day: "The Discovery Co. working four men have struck a rich streak of ground, and expect at least 30 ounces in their next cleanup. Our bedrock shaft is going down as rapidly as two shifts can send it." Twenty-four men are at work on the creek.

COLORADO.

NOTES.—Georgetown *Courier*, June 29: The Lamartine mine has paid over $110,000 since January. Work has been resumed on the Centennial mine. The shaft, we hear, is to be sunk an additional hundred feet. A contract has been let on the American Eagle in Peru district to drive the middle level ahead. Woodward & Hartzell's concentrating works are running on cobbings from the Joe Reynolds mine. The mineral is very hard and in the crude contains about 12 ounces of silver to the ton. Six tons are concentrated into one, the concentrates running about 60 ounces. The Deming, an old location on Republican mountain, just above the Astor trail and almost in the town limits, is being worked by G. W. Hall and Le Neve Foster. In the breast is from 8 to 18 inches of mineral. Three wealthy Eastern men were in town Tuesday, making preparations to take hold of one of the most famous mines we have and proposing to sink the shaft some 500 feet deeper. The streak of ore in the old Burrell shaft still continues down. A specimen assayed a few days ago returned 14¾ ounces gold, 152 ounces silver per ton and 10 per cent copper. Mr. West is grading about the shaft for the plant of machinery and is making a road to it to connect with the old Leavenworth mountain road. Charley Veach has great faith in the Double Header lode on McClellan mountain, and from present appearances his faith is going to be rewarded. He has opened up several inches of quartz sparkling with silver glance, and in much of the glance is seen particles of free gold as large as pin heads.

DAKOTA.

CHLORINATION WORKS.—Deadwood *Pioneer*, June 29: Operations suspended temporarily during repairs to the flume by which water is furnished, resumed yesterday. Contract has been made with the Ruby Bell to furnish a quantity of ore, first installment of which "Red" Forrester reports was forwarded to the works yesterday.

BACK FROM THE RESERVATION.—Jack Gray and Jack McAleer returned yesterday from an expedition to White river on the Indian reservation. The trip was induced by fact that Bill Gay, who has some promising coal locations 30 or 40 miles beyond the short range of hills through which the White river winds its way, brought into Spearfish last February $110 worth of gold, washed out on the river's banks. McAleer went down, ostensibly to hunt, but really to prospect, a week or two after. Indian police followed him so closely he was compelled to hunt game, and was not permitted to linger long enough to look for gold. This obstacle may have stimulated desire. At any rate, ever since his return, the purpose of again going back has been firm. Gray was induced to go along. The two and the two Welchs have passed a pleasant ten days camping out. Their time was otherwise thrown away, and no gold was found, and no such indications discovered as will spur any of the party to hasten back to the reservation again.

PROSPECTING.—Judge D. McLaughlin, R. G. Anderson and Peter O Neill returned yesterday after ten days most agreeably, and it is hoped profitably spent, in prospecting a hitherto neglected portion of the hills. Starting from Deadwood on June 16th, the party, joined at Spearfish by Geo. S. Jackson and Pat Donohue, went first to Bear gulch, and therefrom back to Spearfish creek, where most of the prospecting was done. Everything that looked promising was examined, and before start was made for home the wagon was heavily laden with rock, properly labeled to locate place from which it had been taken, which was brought for assay. It is anticipated that returns will show that the rock is valuable in silver if valuable at all.

IDAHO.

ELMORE COUNTY MINES.—Idaho *Statesman*, June 22: The Kentuck, Champion, Rover and Chieftain mines, owned by H. W. Barry, are 2½ miles from Lime creek, 35 miles northeast of Mountain Home, and 32 miles from Rocky Bar. From a prospect these have been purchased and opened up as a mine by Mr. Barry. The ore shoot has been opened for 400 feet, with a crosscut of 14 feet, without finding the footwall. A main shaft has been sunk 37 feet, and every foot shows up better than the preceding. Over 20 assays have been made of the ore, and show an average yield of $85 to the ton; although assays have been made that yielded $420 gold, and $80 silver, to the ton. The pay-streak of ore runs over 24 inches. The country formation is granite and porphyry. From all tests and assays the mine promises to yield a rich return. The situation is greatly in its favor. Lime creek, but 2½ miles away, furnishes an abundance of water for stamp-mill and concentrators, while plenty of fir is close at hand for building. The roads to and from the mine, either to Mountain Home or Rocky Bar, are natural, and need no expenditure. J. H. McGinley's prospects, Jumbo and Hercules, on Lime creek, near H. W. Barry's Kentuck, show a handsome development of free-milling ore. Two assays show an average of $78. The vein, as near as can be indicated, is 20 feet, with pay streak of four feet. The ledge crops out for 1½ miles, and promises to be the basis of extensive future operations.

WOOD RIVER.—Ketchum *Keystone*, June 29: The recent discovery of an immense body of galena in the ground of the Sunday mine, where, perhaps, hundreds of experienced prospectors have trodden within a few feet of riches, is additional evidence that the Wood River country practically remains to be prospected. A mining region that continues to live and pay from $25 to $40 for the reduction of every ton of ore it markets, must have exceptional mineral wealth. The universal verdict: there are better days ahead. A carload of Silver King ore was shipped by the First National bank yesterday, aggregating in value $3700. Another will be shipped to-day from the same mine. The North Star mine shipped a carload of ore Wednesday and one Thursday. A carload of W. S. Con. M. Co. ore was shipped Monday. The chief shippers from the Upper Wood River country this season are the North Star, Silver King, under lease to Hyndman & Co.; the Solace, leased to Davis & Follis; the Warm Springs Consolidated group, leased to M. Carey; the Mattie, under lease; the Star of Hope, under lease, and parts of the Elkhorn, also leased. A great year for lessees! But this is the true method of development where it must be done without capital. It often succeeds where capital fails.

LOWER CALIFORNIA.

ALAMO, Lower California, June 29: Alamo is sure of another quartz mill within a short time. C. C. Lane writes from San Francisco that he has purchased a complete outfit—engine, boiler, twenty-ton mill and assaying and testing apparatus—and that it will be shipped from San Francisco to-day. The site for the mill is unknown as yet. Mr. Lane represents the Alamo M. and M. Co. The Torres Mill Co. will have their mill running in a few days. A. H. Butler has his mill running night and day, and doing good work. While the International Company are building their road to the pineries they will have probably from 500 to 1000 cords of wood cut for their own use. A number of the best mines are now needing timber before any extensive mining can be done. The windmill is being put up in the plaza and the pipes are about laid for the water system. New leads are being found every day, one especially rich on the north slope of Mount Thomasa. Several very fine specimens were shown from the Montezuma and others, some as fine as any previously discovered. The Bodie, a blind lead in Santa Clara, owned by J. M. Martin, also prospects away up. The Texas, Adelaide, Ulises, Asbestos, Aurora and half a hundred others hold their width and richness so well that it is impossible to tell which will prove the best. The camp is growing richer daily in the amount of ore actually in sight. There is some excitement among the Mexicans over the reported discovery of a large lead of native silver somewhere in this district.

MONTANA.

IN A PROSPEROUS CONDITION.—*Mining Review*, June 27: The mining industry of Montana was never in a more prosperous condition. Every week a number of new and rich discoveries are being made in different sections of the Territory. The developments this year will exceed those of all previous years, at the least calculation, seventy-five per cent. The product of Montana mines last year in gold, silver, copper and lead far exceeded that of any other State or Territory by several millions of dollars, and it is confidently anticipated that this year's product will step up several millions higher. The mines of Helena, Butte, Philipsburg, Marysville, Jay Gould, Drum Lummon, Bald Mountain, Neihart, Barker, Castle, Maiden, and in fact all the mines that are being worked are growing richer as the work progresses. The shortage of snow on the mountains and the absence of the usual spring rainfall has stopped placer mining to a great extent, but this will be more than made up for by the increase in quartz mining. As an indicator of the growth of the mining output the Helena smelter in the past week has added another stack to its already extensive works, and a fifth will soon be demanded.

GOSPEL MOUNTAIN.—*New Northwest*, June 29: Fourteen miles south of Deer Lodge lies the Oro Fino mining district. Hundreds of locations have been made there and others are daily being taken up. The locality has long been regarded with favor by prospectors, but it is only within a comparatively recent time that the mineral wealth of the region has been demonstrated. Saturday last the writer made his first visit to Gospel mountain, on which the more prominent leads of the district are located. The fame of the Champion mine is now attracting attention at home and abroad. The face of the east level shows a body of brittle silver and ruby 12 feet wide. The ore body opened so far has a width of from 4 to 14 feet. The formation is granite and the walls are well defined. There is a mountain of rich ore there and the Champion workings are in the pay streak. The Gospel Mountain Co. is sinking a double compartment shaft, which was down 90 feet Saturday. The shaft is expected to cut the vein at a depth of 200 feet by August 1st. Work is progressing steadily on the shaft being sunk by the American-Ruby Co

NEW MEXICO.

LEASED.—Silver City *Enterprise*, June 29: George Batters has leased the Hobson's Choice group of mines at Bullard's Peak. A strike of some importance was made last week by Paul Curtis and Abner Enoch, leasors on the Old Man mine at Fleming. The ore is a hard gray quartz, and apart from being rich in silver and carries considerable gold. The final payment was made by the Deep Down people last week on the Wagner mine, and the title of property passed. A fraction situated between the Deep Down and the Wagner, owned by F. Bell and E. D. Perkins has also been purchased by the Deep Down company, which is now in splendid shape for extensive operations. The company has plenty of funds in the treasury to carry on the necessary developments, while the mine is showing plenty of good ore, and the mill is running with good results. Postmaster E. M. Young, elated at the development work of Mitchell, Walton and Poloxfen on the Tecumseh property at Telegraph, has concluded to try it once more. He sent men out last week to work on his claims which adjoin the company's ground, and as the find is pitching towards his ground he has every confidence in being able to catch on.

PINOS ALTOS.—The new ore in the Continental holds out, and it is probable that a mill run will soon be made. Fox & Co. are driving work with all possible speed. A new vein on El Dorado No. 2, recently uncovered, shows fine ore. The streak is fifteen inches in width, and careful prospecting places a value of $35 to $45 per ton. Osborne & Co., the owners, are opening up and developing this hitherto unknown vein of their valuable group. The Esperanza, belonging to Tolbert & Co., on the south side of the ridge, is developing handsomely. A radical change for the better is noticeable in the Gold and Silver Ribbon adjoining the celebrated Mountain View on the east. The south drift has increased several dollars per ton in value in the last ten feet.

UTAH.

PURCHASED.—Park *Record*, June 29: The Woodside Mining Co., lately incorporated, purchased the early part of the week of the leasers, Messrs. Drake and Wilmans, all of their interest in the lease of the property and also their interest in the second-class ore on the dumps. This places the company in entire possession of the property and they will at once develop the same and open new bodies of ore. As the Woodside bonanza is now a daily producer it will pay dividends from the start. While the terms are private it is said that the price paid the leasers was $50,000.

THE KERR GROUP LEASED.—John Farish has obtained a lease on the Kerr group, situated southeast of the Ontario and adjoining the Lowell and Parley's Park properties. It is an old property of considerable merit and Mr. Farish proposes to develop it to the best possible advantage and make it produce ore ere long. The group is owned by Messrs. Kerr & Reich of Salt Lake.

AT THE CRESCENT.—Stewart Stephenson has tendered his resignation as general superintendent of the Cresecnt, and has been succeeded by J. R. Nichols of the Salt Lake, vice-president of the company. Foreman Gitsch has been succeeded by Jno. C. King at the mine.

ALLIANCE TUNNEL.—The middle of the week a small vein of ore was encountered in the Alliance tunnel at a distance of about 250 feet from the mouth. It goes well in silver and lead and runs into the Massachusetts Company's ground and also a claim owned by Ferry and Lundin.

MECHANICAL PROGRESS.

The New Process for Softening Steel.

The new process for softening steel known as Dalzell's process, has recently been brought into practical use, and seems to be attracting much attention because of the remarkable softness produced. It is said that by this process any of the ordinary steels, of the usual lengths and shapes, for making machine tools, punches, and dies, will, when treated, become so soft as to effect a most material saving in the cost of making the desired tool. After having been softened and cut to the required form, the steel is handled in precisely the same way as any of the well-known brands, such as Jessup or Black Diamond. It is claimed that the process, which is kept secret, affects in no way the chemical composition of the metal, but so alters its physical structure as to impart the qualities mentioned. A piece of Jessup steel which had been softened by this method was taken to the Stiles & Parker Press Co., who made a punch to cut a five-pointed star seven-eighths inch in diameter and unusually sharp at the points. According to the instructions given, the punch was to be made and then tested by the Stiles & Parker people. In the making of this punch they saved about 20 per cent in the cost, owing solely to the softness of the metal. After having cut it, they tempered it in the usual way in water. The punch was then forced through German silver 3.32 inch thick, and through wrought iron 3 16 inch thick, and as a final test was forced through metal which cut only a part of the star, thus giving an unbalanced pressure tending to bend the punch. It was given a series of tests, not only unusual, but which would not be tried except under like conditions, where the manufacturer is instructed to give the tool the severest trial possible, and where, as is natural, he passes from one test to another more severe. The tool came out at last as perfect as when it left the makers' hands.

According to this it seems evident that the process while softening the steel, at the same time so changes it that when tempered it possesses greater strength than the same quality of metal untreated. The process is particularly applicable to die-sinking, where the hub, being of softened steel, can be made in much less time, while the die, also being softened, can be sunk cold instead of hot, as is now the common practice, thus saving time and labor. The die is then tempered and hardened in the usual way. It is claimed that this process changes what we might name the final quality of the metal, so that its strength in high grades is increased at least 25 per cent. In handling the steel during the making of any tool, it is absolutely necessary to perform all operations cold, as the heating of the metal destroys the qualities imparted to it in the softening process. After having been treated, the steel can be forged cold, can be twisted or bent in a way it would not stand before treatment, and can finally be tempered as desired. Any of the well-known brands of tool steel can be subjected to this process, and can afterward be treated in the usual way.

ECONOMY IN OIL.—A number of years ago a certain man took the contract to furnish oil, waste and brasses for all of the coal cars on a trunk line. He believed that the best was the cheapest. In all his purchases, therefore, he bought only the best of supplies. He attended to the business in person, and throughout the whole time of the duration of his contract not a train was delayed by a hot-box, while the standard train hauled by the locomotives in the service rose from 14 to 19 cars. Unfortunately for the railroad company, he made money out of the job, and the purchasing agent found it out. This wily official therefore persuaded the railroad authorities that what man had done man could do, and that the company could purchase its own supplies and save the profits of the contractor. So when the contract expired it was not renewed, and the era of cheap oils and waste once more set in. As a result, in less than three months, or as soon as the old oil had all worked out of the boxes, the length of train hauled dropped from 19 cars to 14, and the cost of oil and waste had risen above the figure paid to the contractor. Here was a case of a direct loss to the company of over 26 per cent in the hauling-power of its locomotives, due entirely to a difference in the grade of oil used. The reader will readily understand that this will compensate for a vastly greater difference in price. In each case the engine was doing all the work of which it was capable, therefore the consumption of coal remained the same. The company lost 26 per cent in crew wages, and the increased cost of oil, but the purchasing agent had the satisfaction of knowing that he was paying the bottom prices for supplies. It can hardly be asked whether it paid the company to disregard such a purely theoretical matter as the coefficient of friction of the oil it was using.—*National Car-Builder.*

CHAIN CABLES.—Messrs. Bradlee & Co. of Philadelphia are making chain cables for the Government, under the new formula determined by Lieutenant Mackenzie. The breaking resistance must be one million times the square of one-fourth the diameter, or for a two-inch cable, 250,000 pounds. The terms of contract also require the testing of the entire cable to one-half the breaking load, and a breaking test of three links taken at random. The requirements were heavier than those hitherto laid down, and only one tender was received. Tests already made from a completed cable show an excess of nearly 10 per cent over the breaking strength required.

Iron Buildings.

Iron buildings in many respects offer advantages that are possessed by no other material. There is, of course, nothing new in the idea. Every one is familiar with iron as a part of the material entering into house structure, and occasional cases are called to mind where small structures have been constructed exclusively of corrugated iron so far as the covering is concerned. But of late, according to the English papers, a great step in advance has been taken in bringing iron more prominently into use for house construction, and especially for such purposes as farm outbuildings, stables, shooting-boxes, lodges, cottages and small houses it is without doubt the material *par excellence.* Messrs. Bruce and Still of Liverpool are probably the largest manufacturers and dealers in the kingdom. They are constructing iron houses for almost every purpose, from a billiard-room to a shooting-box, and have orders from all parts of the world. They have constructed iron buildings which are highly artistic in design and wonderfully cheap. As an instance may be mentioned that a billiard-room, for which a London house sought to charge $250, Messrs. Bruce and Still can supply at about one-half that price. It is hardly necessary to say that the iron is corrugated and galvanized, whereby strength is secured and oxidation prevented.

A very favorable account is also given in the French papers of the new system of building houses of iron and steel plates, introduced into France by M. Danly, manager of the Societe des Forges de Chatelneau, who has set forth its various advantages in an interesting and plausible manner, attracting considerable attention. M. Danly has satisfactorily ascertained that corrugated sheets, of no more than a millimeter in thickness, are sufficiently strong for building houses several stories high, and the material used allows of quite a variety of architectural ornamentation. The plates thus employed are of the finest quality, and, as they are galvanized after they have been cut to the sizes and shapes required, no portion is left exposed to the atmosphere. It is asserted that houses constructed in this manner are very sanitary, and that the necessary ventilating and heating arrangements can readily be carried out.

An Interesting Marine-Engine Trial

The English correspondent of the *American Manufacturer* gives a very full account of the first marine-engine trial carried out on any large scale at sea for any great length of time, in which the feed-water was measured and the coal weighed throughout the trial. The trials were made upon the steamship Meteor, a vessel belonging to the London and Edinburgh Shipping Company, and fitted with the most approved triple-expansion engines, with two double-ended boilers and twelve furnaces.

The object of the trial was to measure the coal, water and indicated horse-power as accurately as possible and over as long a period as possible. The Meteor's length between perpendiculars is 261 feet; registered tonnage, 692; gross tonnage 1223; underdeck, 958 The displacement or trial was 2090 tons, with 15 feet 1½ inches draft. We condense briefly as follows:

The coal used was 4005 pounds per hour. The average temperature of the feed water was about 165° F. The average revolutions were 17.78 per minute. The main boiler pressure was 145.2 pounds. The evaporation was 7 46 pounds per pound of fuel. The ratio of heat turned into work was almost exactly 10 per cent. The mean speed was 14.6 knots.

The Value of Triple Expansion

Was strongly confirmed by these trials. The performance of the triple engines on the Meteor was better than is generally claimed for this type of engines even by manufacturers, and if the coal used had been better, doubtless the boilers would have given results even more satisfactory than those which were attained. A separate committee of the Institute is engaged, it may be remarked, upon investigating the benefits of the steam jacket in cylinders generally, and is paying attention to the results accruing from heating the jackets by steam and by heated gases respectively. Marine-engine trials were never more valuable than at present. The development of marine engineering is rapidly progressing at this time, and is a matter of constantly increasing importance to all commercial nations.

STEEL BOATS.—It is stated that hereafter the boats to be carried by Atlantic steamers instead of being made of wood will be made of steel in one piece. Wooden boats rot and are easily crushed. The new boats will be built by machinery especially made for rolling them out in all sizes in a single plate.

THE POSSIBILITY OF AIR-SHIPS.—The small weight of an aluminium engine, driven by compressed air, gas or electricity, compared with its iron equivalent, undoubtedly makes the ultimate success of air-ships more probable than before.

SCIENTIFIC PROGRESS.

THE MYSTERIES OF VISION.—Emil Sorel, in *La Nature*, says: "There are days on which, in certain weather, and despite the curvature of the earth, the distance of visibility is doubled, or more than doubled. This phenomenon is explained to us by a well-known law of physics. If we throw a coin into an empty vessel, it will be hidden by the edge of the latter, at a certain distance; but if we fill the vessel with water, the coin will become visible. We have here a case of refraction, such as is explained in elementary works on physics. Every one also knows the theory of the mirage put forth by the celebrated Monge, who explains the phenomenon as due to a diminution of the air's density in contact with the superheated earth. A contrary theory will explain the mirage at sea. While the sun is making the atmosphere intensely hot, the sea and the strata of air in contact therewith remain relatively cold, and these strata become superposed in the order of their density. A luminous ray emanating from the sea will pass from one stratum into another of less density, there will be a refraction, and an object beneath the horizon will be seen above it. This theory supposes two conditions, to wit, a heating of the atmosphere, while the sea and the earth remain relatively cold, and a calmness of it to permit its strata to become superposed in the order of their density. It is precisely when these two conditions are fulfilled that the phenomenon of the mirage occurs. On such days ships rise instead of descending in measure as they recede. As the horizon is perceived by direct visibility, a ship is finally seen above the horizon as if it were suspended in the air. It is the famous 'phantom ship,' familiar to sailors—a visible ship in its natural upright position. If atmospheric conditions were favorable, a second ship would be seen above the first, etc. Certain mariners worthy of credence have assured me that they have seen as many as seven superposed ships."

THE LATER DEW THEORY.—It is now held by the best physicists that instead of falling from above, the dew rises from the earth. The generally received opinion that the dew is formed of vapor existing at the time in the atmosphere, must be given up for the established fact that the vapor which rises from the heated earth is trapped by the cold surface earth. Besides, when we imagine that, on a cold evening after a sultry day in summer, our feet are being wet by the dew on the grass, we make a grave mistake; for that moisture on the grass is not dew at all, it is false dew—in reality the transpired humor of the plants. The drops at the tips, which glisten diamond like, are not dew; close examination shows that these crystalline spheres are situated at all the points where the veins of the leaves cut the outer edges. These drops only give evidence of the vitality of the plant. The difference between the true dew on the grass and the exuded drops through the veins from within the grass can be easily distinguished; for the former is distributed all over the blade in a moist film, whereas the latter are of some size and are situated near the tips of the blade. Altered, then, is the meaning of the line, "Ilka blade o' grass keeps its ain drap o' dew;" for those brilliant globules on the petal, shaking to the same sweet air, and often "gliding at once all fragrant into one," are not dewdrops, but are the exudations of the healthy plants. They give evidence of the *elixir vitæ* of vegetation; whereas the true dew is the pearly luster, varnished in filmy humidity over the blades by that wondrous alchemy which transforms the water vapor rising from the ground into the plant-refreshing dew.

CRITICISM OF SCIENCE.—Men of science may, as individuals, fall into many errors. They may fail to realize the true dignity of their calling; they may be unduly swayed by party spirit or by personal aims; they may be unworthy ministers of the truths which they deliver. But science, what is it but truth? To all who are dissatisfied with the present currents of thought we would, therefore, say: "Criticise men as much as you please. Point out their errors, their failings, intellectual and moral, with all needful severity. Hold up the standard by which you think their lives and thoughts ought to be governed. Criticise theories, too. Let nothing pass unchallenged or unscrutinized that you are not satisfied is true. Let no glamour of great names, no popularity of certain modes of thought, deter you from expressing your dissent from what you do not believe. But do not put yourselves hopelessly in the wrong by attacking science, or by abusing the scientific spirit. You will gain nothing by it, but will merely darken your understanding and shut yourselves out from the light that is ready to lighten every man that comes into the world. Science will abide. It has its roots in the everlasting rocks, and draws its aliment from universal nature. The scientific spirit will abide, admonishing men of their errors and leading them into all truth. It is wise to be reconciled to such powers as these; even now while you are in the way with them make terms of peace and find rest to your souls."—*Popular Science Monthly.*

PHENOMENA OF COLOR.—Contrary to what has been the general opinion, a recent writer on the nature and phenomena of color asserts that its causes and effects are determinable solely by the wave theory of light, that color depends, in fact, upon the number of light waves reflected from any object impinging upon the retina of the eye. According to this theory, there are in red about 40,000 waves to the inch, and these will strike the eye at the rate of four hundred and forty-seven millions of millions of pulsations per second; in violet there are 57,000 waves to the inch, and six hundred and ninety millions of millions of pulsations per second, the other colors having wave lights intermediate between these two. From this the conclusion is arrived at that color does not really exist either in the object or in the mind or in the brain of the observer, but it is an effect. This, it is thought, may be illustrated by the fact that there can be no appearance of a fire on a desert island where there is no eye within seeing distance; the chemical process known by the term combustion goes on, but there is no appearance of the flame save when its light waves strike upon the retina of the eye.

INGENIOUS ART PROCESS.—The name of pyrogravure is that of a new and ingenious method of engraving in black, reddish-brown, bister, etc., by the use of a red-hot metallic point, the operation being as easy as that of drawing with a pen or pencil, a scraper and some gum serving to suppress or lighten the lines upon wood, just as upon paper. The instrument used is a burner, which is kept at incandescent heat for an hour or more by a charged gasometer of compressed carburetted air, which is easily regulated and kept at any desired point of heat, so that the draftsman has nothing to think of but his work. It is claimed by the inventor, M. Perier, that both art decoration and industrial ornamentation have in pyrogravure a new means of utilizing the talent of the artist and the skill of the workman, it being as practical by this means to draw a portrait or landscape as to decorate a room, a piece of furniture, or any other object, or to mark the handle of a tool. The lines produced by this method have not the same degree of sharpness characterizing those given on wood by the graver or gouge; but it increases the decorative effect of marquetrie and of objects of wood or leather inlaid with metals, ivory, mother-of-pearl, etc. Binders, cabinet-makers, toy manufacturers, etc., can resort to this system with advantage for the cheap ornamentation of their products; in a word, anything capable of being carbonized, or modified by the action of burning, can be ornamented by this process.

IS THERE ANYTHING NEW UNDER THE SUN? It has been discovered that the idea of the "drop a nickel in the slot boxes" is older than Christianity. In the Egyptian temples devices of this kind were used for automatically dispensing the purifying water. A can of five drachmæ dropped into a slit in a vase set a simple piece of mechanism like a well-sweep in motion, a valve was opened for an instant and a portion of the liquid was permitted to escape. The apparatus is described in the "Spiritalia" of Heron of Alexandria, who lived 200 years before the Christian era, and is illustrated in the sixteenth century Latin manuscript translations of his work, in which, by the way, is also delineated the Egyptian fire engine of the author's day, with its double force-pump valves, lever arms, goose neck, and probably, too, air chamber—but this is a mooted point—which form the essential feature of the machines of the nineteenth century.—*Fire and Water.*

NEW MODE OF TRANSMITTING FORCE.—M. Sayers, a French engineer, is the inventor of an apparatus for transmitting force between bodies moving at greatly varying velocities without the accompanying disadvantage of a violent collision. The plan consists in furnishing the contact surface with steel brushes, which, by the entanglement of their "bristles," are enabled to grip one another. In this way, it is found, the swiftest motion may be imparted gradually to a perfectly stationary body. The object in this device is, chiefly, the requirements of quickly moving lifts, railway trains and other bodies moving at high speed and with great momentum; and the importance of this can hardly be overestimated, as, for example, in the production of an effective brake, or in obtaining an automatic working of railway signals.

SUPPOSED TIDES IN THE EARTH.—Some 20 years ago, Herr Faib, an Australian scientist, first suggested the possibility that the moon may act upon the great ocean of molten matter beneath the earth's crust exactly as it acts in producing the tides of the external ocean of water. He now considers that the reality of such action is proven, and that the earth's crust is severely strained, and more or less warped and broken, at the times the theory would indicate. It is during the periods of greatest strain resulting from the moon's attraction that earthquakes appear to be most likely to occur, and that gases seem to be forced into coal mines to such an extent as greatly to increase the explosions.

CASTING WITHOUT SAND.—A Wakefield foundryman's patent is said to abolish sand in casting pipes. "In superheated steam or gas-jacketed metal molds" pipes are cast which are uniform, sound and true, as if turned or bored by a lathe. The pipes so cast are not porous, and they have other excellent qualities, it is said.—*Glasgow Engineer.*

CANAL BUILDING in France is crowding the railroads to the wall.

GOOD HEALTH.

A NEW SYSTEM OF WATERPROOFING.—It is well known that waterproof garments are objected to because they are impervious to air, the result of the coatings of india rubber and other non-porous substances which are applied as a film over the textile base of the cloth. This film is liable to break and shell off, thus putting an end to the waterproof character of the garment, and admitting air as well as water through the interstices between the warp and the weft. It is found also that with systems which close up these openings the penetration of water is only temporarily impeded, as it adheres readily to the other surfaces of the cloth which absorb the water driven away from the covered spaces. The great requirement is a fabric which, while allowing all excessive heat to escape from the wearer, shall at the same time prevent moisture from passing through. This is said to have been accomplished by Messrs. W. H. Craven & Co. of Bradford, England. Specimens of cloth prepared by this process, when placed under water, do not absorb that liquid, but it flows from its surface much in the way that water passes from the proverbial duck's back. Examination shows also that these textiles are permeable to air, the spaces between the threads being as free to the passage of air as in ordinary cloth. Cotton, wool or silk is treated by this process. While passage is free to air, water will not pass through except under pressure or when forced violently against the fabric. The color and appearance of the material is not affected by the treatment. The important feature is found in the fact that the material treated is impervious to rain, but not to air. Hence a light hygienic and elegant waterproof garment can be made whose folds fall perfectly natural, with color and texture fully preserved.

TO CURE BALDNESS.—A few words about one of the most common forms of skin disease among us. Baldness is so widely spread and universal among us that it is quite fashionable. Nevertheless, I shall give a couple of recipes for that form that is accompanied by fall of dandruff, which is technically known as dry seborrhea of the scalp. In nine-tenths of these cases a cure is possible; that is, hair may be restored if sufficient patience is allotted with other treatment. Owing to barbers' failure to give back to a man his hair, a general impression exists that there is no use to try; once bald, always bald. This is scarcely ever true of seborrhea, not in 50 per cent of cases from other causes, and whoever will try these recipes will be convinced of their efficacy. For a week, at the outset of treatment, the scalp is to be thoroughly washed with a reliable tar soap, such as any apothecary sells, drying the hair thoroughly, but not rinsing out the tar. If hair has vanished, let the lather dry upon bare spots. Then begin with a wash compound of resorcin pure, one dram; castor oil, one-half ounce; bay rum, 7½ ounces. Mix. This is to be applied morning and night, and well rubbed in. After two weeks of lotion, have the following pomade prepared, and rub into the scalp and hair a portion the size of a hazel nut every morning: Salicylic acid, ten grains; ammoniated mercury, five grains; cold cream, one ounce. Mix. After one week's careful attention to this treatment the bald spots will be covered with a fine, thick, silky growth, that is forerunner to a crop worth having. Try it. *American Magazine.*

SMOKER'S HEART.—Within the past 20 years the medical faculty has come to clearly comprehend and to accurately diagnose a disease which they now denominate as "smoker's heart." Excessive smoking, whether by pipe, cigar or cigarette, affects the action of the heart and disturbs the circulation. The pulse will intermit—not with any regularity—sometimes one beat in four, sometimes one in ten, sometimes two or three at a time, and then comes trouble. The brain, missing its regular pulsations of blood, wavers, the heart flutters, and then follows a temporary collapse. Strong cordials are indicated. Strong coffee is good—strong spirits better. *But the remedy,* too often relied upon, *is as bad as the disease;* and the subject grows slowly worse. Angina pectoris is said to sometimes result. One of the leading physicians of this city relates a case in point. A patient suffering from "smoker's heart" believed that he had a chronic heart disease, and came for a careful examination early in the day—before he had eaten any breakfast. The stethoscope showed the heart to be sound as a dot—he had not smoked for 12 hours. Greatly relieved at the verdict, he lighted a big black cigar, and sat smoking upon an empty stomach, while he talked. In a few minutes, as he rose to go, his feet failed him and he fell in a momentary faint. The heart was fluttering wildly, but yielded at once and resumed its normal action after a strong stimulant.—*Cincinnati Enquirer.*

TOOTH DRAWING AGUE.—"It's queer the way people are affected by visiting a dentist's office," remarked a dental surgeon to a Pittsburg *Dispatch* reporter. "Some no sooner come here than they seem to be seized by a sudden chill which sets them to shivering all over. They get in the chair and I turn on the natural gas to make as much heat as possible. Why, I've even had to put blankets around my patients to keep them comfortable on a warm day. Others are thrown into a feverish state, and the perspiration breaks out the minute they sit down. Then of course I have to shut off the fire. But the strangest thing about both classes of patients is that their chilliness or feverishness leaves them immediately after they quit the chair. It is nervousness and dread that cause these remarkable physical effects, I suppose. But it's about as hard on me as it is on them, for the unevenness of temperature in the operating-room, which I must perforce endure, keeps me suffering from a cold, catarrh, or headache about half of the time."

PHYSIOLOGY OF PLEASURE. — The question has often been asked as to what constitutes the greatest pleasure, and who is the happiest man, but it is obviously one that does not admit of solution. The intensity of the pleasurable sensation is a matter of temperament and surroundings, but *cæteris paribus*, the happiest man is he who possesses the greatest sensibility, the most powerful imagination, the strongest will and the least number of prejudices. The men are rare who can, by an effort of the will, arrest the oscillations of sorrow and allow only chords of pleasure to vibrate. Pleasure is the mode of sensation, never the sensation itself, and it is not a paradox, but an incontestable physiological truth, to say that no pleasure exists which is essentially or necessarily a pleasure. The ideal of perfection in humanity would be to efface pain from the list of sensations, and to give all men the maximum number of pleasures. All the rest, as the philosopher said, is but dream and vapor.

A PECULIAR BIRTHMARK.—Joseph H. Rotherman, a carpenter of Connellsville, Pa., has on the back of his neck a birthmark, crescent in shape and bluish in color. When the moon is turning its first quarter, the mark becomes reddish and begins to swell. As the moon grows older the mark becomes redder, and the flesh swells correspondingly. When the moon is full, the crescent on Rotherman's neck is bright red, and the flesh assumes a horn-like roll, over two inches in thickness at the largest part, gradually tapering to a point on the shoulder. As the moon wanes the mark decreases in size and color until it again becomes a bluish crescent-shaped mark.

CREMATION A FAILURE.—Cremation is apparently a failure in Philadelphia. The crematory in that city is said to be the largest in the world. It has been in-operation since May, but thus far the receipts have not equaled the expenses, while the price of incineration has been reduced from $50 to $28. The Philedelphia *Times* states that, notwithstanding the reduction, "an order has not been received for three weeks." Still the president of the enterprise declares that he is not discouraged.

USEFUL INFORMATION.

The Evolution of the Piano.

The piano, as we see it to-day, is the growth of centuries of invention. In its infancy it was a harp with two or three strings. From time to time more strings were added, and after awhile the cithara was born. The cithara was in the shape of the letter P, and had ten strings. It took many centuries for musicians to get the idea of stretching the strings across an open box, but somewhere about the year 1200 this was thought of and the dulcimer made its appearance, the strings being struck by hammers. For another hundred years these hammers were held in the hands of the player, and then a genius invented a keyboard, which, being struck by the fingers, moved the hammers. This instrument was called a clavicytherium, or keyed cithara. This underwent some modifications and improvements from time to time. In Queen Elizabeth's time it was called a virginal. Then it was called a spinet, because the hammers were covered with spines of quills, which struck or caught the strings of wires and produced the sounds. From 1700 to 1800 it was much enlarged and improved, and called a harpsichord, and this was the instrument that Lady Washington, Mrs. Hamilton and the fine ladies of our revolutionary times played on.

In 1710 Bartolomeo Cristofoli, an Italian, invented a key or keyboard, such as we have now substantially, which caused hammers to strike the wires from above, and thus developed the piano. In the past 150 years there is no musical instrument which has so completely absorbed the inventive faculty of man as the piano. At the present day the upright piano has the field almost entirely to itself, and has reached such a high grade of perfection in shape, tone and appearance that there would appear to be no possibility of further improvement.—*Musical Courier.*

HOW TO CLEAN GLASS WELL.—Two servants employed in adjoining houses were talking recently about their methods of cleaning windows. The one whose windows always looked the brightest said she selected a dull day for the work, or a day when the sun was not shining on them, because when the sun shines it causes them to be dry-streaked, no matter how much one rubs. The painter's brush is the best article for this purpose, then wash all the woodwork before the glass is touched. To cleanse the glass, simply use warm water diluted with ammonia; don't use soap. A small stick will get the dust out of the corners, then wipe dry with a piece of cloth—do not use linen, as the lint sticks to the glass. The best way to polish is with tissue paper or newspaper. To clean windows in this way takes much less time than when soap is used.

WHITE PITCH.—An important invention has recently been made in England which will be extensively used in connection with shipbuilding and the efficient maintenance of ships, and is brought to notice by Mr. William Wells, chemical manufacturer, Leith, in the form of white pitch or calking-glue. This material meets the demand which has so long been open for a white instead of a black pitch; one, moreover, which can be melted and run into the deck-seams in the same way as ordinary pitch, and which will do away with the laborious and expensive method of forming white seams with putty. The new material, known as white calking glue, is offered as the result of a series of experiments which have at last enabled Mr. Wells to produce a white pitch possessing the various qualities required for calking purposes; viz., strength, a safe melting-point, adhesiveness, and the property of melting into a thin liquid without frothing. Used in the same way as ordinary pitch, it is free from the odor characteristic of tar, and it is pure white in color. It makes a sound seam, is easily applied, and cheaper in use, we are informed, than white lead putty, as it has three times the bulk of the latter. For the better class of ships, and especially for yachts, the invention is of much importance, on account not only of the improved appearance it presents on a well-kept deck, but for the greater durability which its use insures. The material has already been extensively adopted by ship-builders, and has lately been used on two of the finest steamers afloat—the Inman liner City of Paris and the White Star liner Majestic, which is famous as the longest vessel in the world.

DOG BISCUITS, ETC.—The production of prepared foods for domestic animals may be considered as an entirely modern industry which has been developed within the last twenty-five years. Mr. Spratt was one of the first to turn his attention to the preparation of these substances, and his first production was a clean, cheap and nourishing dog food. Since then, other branches have been added to the business, and at the stand of Spratt's Limited specimens of food for poultry, pigeons, horses and cattle, as well as the famous dog biscuits, may be seen. These latter are made from the fibrine obtained from American beef, combined with Scotch oatmeal, wheat, flour, dates and beet-root. Apropos of this last-mentioned ingredient, it may be stated that it was found to be the only vegetable which does not lose its peculiar properties under the baking process which, involves a heat of 700 degrees in the oven. Even under the influence of such a heat as this, it takes nearly forty minutes for the tray of biscuits to pass through the oven, which is ninety feet or about thirty meters in length. The average quantity of fibrine dog-cake which is thus manufactured at the firm's works, at Bermondsey, London, S. E., amounts to about 200 tons per week. The biscuits are famous throughout the world, not merely as a food, but also as a valuable preparation calculated to preserve dogs in good health.

CHEAP SOLUTION OF ZINC.—It is stated that a New Englander has recently discovered a cheap method of dissolving zinc by combining it with hydrogen, and producing a solution called zinc-water. This liquid, if applied to certain woods, notably whitewood, makes it absolutely fireproof, and at a low cost. Mr. Edward Atkinson, the Boston economist, in speaking of it at Cornell University, says he regards this discovery as one of the most important of the age, and one that will surely revolutionize fire insurance, as well as immensely decrease the losses by fire. The invention is kept secret for the present. Sir Lyon Playfair, the English scientist, corroborates all that is claimed for the invention, and says that the inventor has a faculty of blundering into the choicest secrets of Nature's laboratory. As soon as patents are perfected and capital interested, zinc-water will become an article of commerce.

THE PROGRESS OF AGRICULTURAL SCIENCE has received a valuable acquisition in the Seventh Annual Report of the Board of Control of the New York State Agricultural Experiment Station at Geneva. The report comprises 428 octavo pages, and is replete with information most valuable to agriculturists, not founded on mere theories of *savants*, but resting upon actual experiences, with notations of variety of soil, atmospheric conditions, kinds and quantities of manures, etc., and a trustworthy relation of the results attained. These reports deserve a liberal circulation in every agricultural State and Territory of the Union.

THE USES OF SACCHARINE. — Saccharine seems now to be extensively used as a substitute for sugar in syrups and preserves, and even in champagne. This last is a fact fully recognized in commerce. Even as a medicine, saccharine is not harmless. M. Worms says that diabetic patients who use it for a fortnight lose their appetites. M. Dujardin Beaumetz thinks, however, that as a therapeutic agent saccharine is useful in the case of the few diabetics who cannot do without sugar. The *Gazette des Sciences Medicales* thinks there can be no doubt as to the propriety of preventing its general use.

ENGINEERING NOTES.

The American Elevators in the Eiffel Tower.

The construction of the elevators for the Eiffel tower was one of the most difficult problems the builders had to contend with. The elevators had to go up the center of the four columns, and before their junction these columns contain an incline and a curve. The straight part of the tower presented no difficulty; the incline could be got round, as it was not an unprecedented thing to run an elevator up an incline, but no one knew how to make an elevator describe a circle, at least not in France. The American Elevator Co. was prepared to accomplish this novel feat of engineering, but in addition to a strong prejudice in France against foreign contractors there was a stipulation that no foreign material should be used in erecting the tower. After many futile attempts to find native engineering talent which would solve the problem of placing the elevators and not outrage national feeling, the commission had, after all, to fall back on Yankee skill. They did so reluctantly, and then only gave part of the contract to the American company; hence there are three systems of elevators in the tower.

To strike a radius of 160 feet for a distance of over 50 feet required a great amount of preparatory study, and the American company worked on the problem for over three years. The first thing is the motive-power. A cast-iron cylinder, 43 feet long and 38 inches internal diameter, is placed at the foot of the track, and contains a piston which moves up and down. Attached to the piston are Bessemer steel rods 4½ inches in diameter, which are connected at their upper ends with what the French call a chariot, consisting of wrought-iron girders supported on steel wheels, which move up and down with the piston. There are six pulleys in the chariot—each five feet in diameter—and cables pass round these pulleys; at the extreme upper end of the girders there are six similar pulleys, and cables pass round these pulleys in such a way as to form a "tackle" so that the speed of the piston is multiplied 12 times. This arrangement makes the car move 12 feet for every one foot the piston moves. From the chariot the four cables continue, always supported on pulleys, fixed on to an iron framework, down the other side, and are attached to the car of the elevator. The car is a large carriage of two stories supported by an iron framework and fixed on to the big steel wheels.

The carriage accommodates 50 persons, 21 in the lower compartment and 29 in the upper. It moves along an incline of 54° to the first story—a distance of about 185 feet. Then it describes a radius of 160° and continues the inclined route, which changes slightly, from 74° to 78°, to the second story, which is about 420 feet high. Any one of the six cables attached to the car is capable of supporting the whole weight, and there are all our usual safeguards, in case of accidents, adapted to the special construction of the elevator. A counterbalance 12 tons in weight runs on a track behind the car, and is attached to it by two cables. Six cables leave the car—two of them turn over to the right at the top, and are attached to the counterbalance, and the other four to the chariot. All the piston has to do, therefore, is to sustain the weight of the passengers, as the counterbalance lifts the car. The hydraulic pressure is secured from a tank on the second story, to which the water is pumped.—*Ex.*

THE NICARAGUA CANAL.—Now that the Panama-Canal scheme is practically dead, after a wasteful expenditure of a vast amount of money, attention naturally turns to the proposed canal across Nicaragua, which experts claim not only to be possible, but much easier of completion and at smaller expense than the first estimates of the Panama canal. The terminus of the canal on the Pacific is at the mouth of the Rio Grande, where there is a good anchorage. About three miles of the canal from the Pacific toward the lake, will be in the valley of this stream. The remainder of the distance will be mostly dry excavation. The heaviest piece of work on the line is the great divide cut across the San Francisco range. The cut is to be through rock three miles long, with an average depth of 120 feet. There is no record of any rock cut as large. The climate is much better than on the isthmus. The engineers of the company have been there a year and a half under the most trying circumstances, and not one was seriously ill during that time. A construction party is already on the ground and actual work has commenced. A second party left New York June 23d with a large amount of material with which to continue the work.

AMERICAN RAILROAD BUILDERS IN RUSSIA.—It is said that a powerful American syndicate is about to be formed for the purpose of building railroads in Siberia. Besides a large subsidy, the Government will give 4,000,000 roubles yearly for the transportation of mails and convicts.

THE PANAMA CANAL.—It is stated that the Government of Colombia will not renew the De Lesseps grant when it expires in 1892.

MINING AND SCIENTIFIC PRESS.

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W. B. EWER.....SENIOR EDITOR

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SAN FRANCISCO
Saturday, July 6, 1889.

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[NEW THIS ISSUE.]

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☞ *See Advertising Columns.*

Passing Events.

For the first time this season chrome ore has commenced to come into Livermore. About 100 tons are now awaiting shipment. This ore will be sent around Cape Horn to the East. The Alameda county chrome mines would pay much better if the miners could get better freight rates.

The arrangement made by the Southern Pacific Co. for a large coal supply from Vancouver makes a decided change in the coal business of this port. A great deal of the coal brought here has been from Australia, but this new arrangement will stop some of the Australian supply.

There are rumors of wonderfully rich finds in Oro Fino district, Montana, the quartz uncovered being said to be better than that at Granite. Montana is already the largest producer of the precious metals and new developments are constantly being made.

The PRESS is printed one day earlier than usual this week, for Thursday is our National birthday—the anniversary of the Declaration of Independence, which will doubtless be celebrated near and far with the usual explosions of powder, ringings of bells, processions and literary exercises, in which "The Star-Spangled Ban-..." the reading of the Declaration, and the flaps and screams of the American eagle will occupy the place accorded them by established usage. It is the commemoration of an event which has proved of vast importance to the world, and whatever may be thought of methods of celebration the event should never lose its hold upon the patriotic heart.

A State Geological Survey.

The great importance of a thoroughly well made map of this State, which will show its geological and mineralogical features, is recognized, but it has not been made. In the days of the old State Geological Survey a vast amount of information for such a map was gathered, but no such map was made, because the survey was stopped. Even the map of the pliocene rivers, which had been plotted and colored, was not published. Should a new map now be made it would show reservoir sites suitable for conserving water for our arid lands; should indicate the valley, swamp and overflowed lands, the timber lands and all such information.

This subject has been called to our attention by the article No. 5 of J. H. Crossman in this number of the PRESS, treating on Pliocene Channels, wherein he suggests the importance of finishing the work of Major J. W. Powell of the U. S. Geological Survey in connection with that of Prof. Davidson of the U. S. Coast and Geodetic Survey, and State Engineer Hall's survey and map of the State.

We understand that State Mineralogist Wm. Irelan has already taken this matter in hand, and laid out this work; that his assistants have been selected, and the work would have been now in hand had it not been for some technical error in drawing the State appropriation bill for this and other purposes in favor of the State Mining Bureau.

The amount of the appropriation is $100,000, probably not enough to carry out so important a work, but sufficient for a commencement. This money should be available now, and it will be a matter of regret if Controller Dunn persists in withholding the sum appropriated, through a technical ruling with reference to the appropriating Act. It is perfectly plain that the Legislature intended to give the money for the Bureau, and many lawyers have agreed that the alleged faulty wording of the Act is of no moment. If, however, this money is kept back, a good deal of the time in which field work can be done will be lost. It is unfortunate that this misunderstanding should have arisen at this time, since work that should be done promptly is being delayed.

California Academy of Sciences.

The regular monthly meeting of the California Academy of Sciences was held the evening of July 1st. The stated paper of the evening, "Descriptions of New Mammals," was read by Walter E. Bryant, collector and curator of the Academy's mammals. The paper was devoted to the squirrels of our coast, and the following were exhibited and described for the first time: Black-footed Tree Squirrel (*Sciurus fossor nigripes*); Black-capped Ground Squirrel (*Spermophilus grammurus atricapillus*). Great confusion has previously existed in regard to the identity of our squirrels. The complete study which is being given the matter by Mr. Bryant will, no doubt, do much to throw light upon the subject. A member present stated that our California flying squirrels, which are nocturnal in their habits, are peculiarly attracted by white tents, which, if pitched in the vicinity in which they are found, will collect them in numbers, when they will race up and down, from the ridge-pole to the ground, all night long. Hon. J. de Barth Shorb presented the Academy with a reddish-colored petrifaction, supposed to be a section of a species of pine. This gave rise to a discussion of the species of timber composing our petrified forests.

THE Governor has appointed and commissioned C. E. Grunsky of Sacramento a member of the Examining Commission of Rivers and Harbors, vice William Ham. Hall, disqualified by reason of holding a Federal office.

IT is stated that a gas well has been dug 30 miles east of Ukiah, Mendocino county, that sends out 4,000,000 feet of gas in 24 hours. It is proposed to pipe it to the town and use it.

Silver Facts and Figures.

NUMBER 2.

In discussing the silver problem, the fact must not be lost sight of that the silver which goes to either India or China never returns to the Western hemisphere, while it is valued there even higher than the coinage par of Europe and America, and also while silver bullion is at a heavy discount in America and Europe. Therefore any bullion imported by India or China either remains there or is taken by other oriental nations, all being alike on a silver basis, constituting, as they do, with their 775,000,000 inhabitants, more than half the world's estimated population. The silver taken by them is as much lost to the other nations as if sunk into the sea or buried in the bowels of the earth. As stated in last week's article, China's silver imports, not included in the correct presented list, have aggregated $12,600,000 a year, and exports of silver $6,600,000. The latter she could only export to other nations in the Eastern hemisphere without sinking the premium it bears there, and consequently her whole import is included as an average annual addition of $12,600,000 a year to the Eastern dumping-grounds.

As stated in last week's article, India took in silver from 1850 to 1886 $1,399,000,000, and China for the like time took $443,600,000, making a total of $1,842,600,000 of the world's silver product or supply for the same length of time, while the mines of the world turned out only $2,305,000,000, leaving $463,000,000 for new bullion coinage outside of the Eastern hemisphere, whereas, as shown last week, the actual coinage in that period aggregated $2,551,487,000 in the Western hemisphere.

The coinage of the mints of the world has more than kept pace with the yield of the mines, as shown by the following latest-compiled table of comparisons for the five years ending with 1887, as furnished by the official report of the United States Mint Bureau:

	Coinage.	Production.
1883	$109,306,705	$116,938,000
1884	95,832,084	110,773,000
1885	126,764,574	122,799,000
1886	124,854,101	125,828,000
1887	160,994,877	135,449,000
Totals	$617,742,341	$611,787,000

Professor Soetbeer, the European oracle on money, estimates the annual consumption of gold in the arts by all nations at 90,000 kilograms, plus 20,000 kilograms of old material, and the consumption of silver in the arts at 515,000 kilograms, plus 137,000 kilograms of old material. This shows that the net silver bullion taken up by industrial consumption, 515,000 kilograms, amounts to $21,403,400 a year, and that of gold to $59,814,000. Accepting the above as correct, and we have a consumption in the industrial arts for the five years ending with 1887, of $107,017,000, which, added to the coinage, gives a total for the half decade of $724,759,341, against $611,787,000 the outturn of the mines. The result is, while leaving out of consideration the incidents of abrasion and loss, a net bullion supply of $611,787,000, and a net bullion consumption of $724,759,341, which gives an average annual consumption over production within that time of $22,594,468.

But this line of inquiry can be extended still further. In his official report just issued, Mint Director Kimball gives the silver coinage for 1887 by countries as follows:

British India	$44,142,013	Cochin-China	$3,126,410
United States	35,191,081	Turkey	2,216 668
Mexico	26,844,031	Siam	2,159,690
Spain	11,389,414	France	1,719,742
Japan	10,279,556	Russia	1,551,710
Italy	6,253,200	Peru	1,685,000
Austria-Hungary	5,556 395	Miscellaneous	4,723,435
Great Britain	4,142,136		
Total			$160,984,877

To offset the above there must have been considerable recoinage, for the products of the mines of the world in 1887, estimated even at a coinage value of 371 25 grains to the dollar, was only $135,449,410 in silver bullion (at the United States coining rate of silver the production of the mines was only $125,346,321), which gives a deficit of $25,535,467. The production includes all nations, but the coinage and absorption into circulation does not include 34 per cent of the earth's population, and that part using no other money but that of silver. It does not include the Chinese Empire and many islands in the Pacific and South sea, and only a corner of Africa.

In the light of the above, we ask, where, then, is the source of the supply from whence the mythical dump of silver is to come?

Any man gifted with common reasoning faculties and of honesty of motive must concede that with such environment of solid facts as we have presented, if the mints of the United States were made as free to the coinage of silver as they are to gold, the coinage parity would be instantly restored between silver bullion and the standard dollar, and thereby between the silver dollar and the gold dollar. He must concede that this would re-establish the position of silver bullion throughout the Western Hemisphere. He must concede that silver would be the safest commodity, except its ally—gold bullion—in the world to hold, because its value would be guaranteed by the richest Government of the world at a fixed price. He must concede that the nations of the world with their $3,500,000,000 of silver money and $3,125,000,000 of gold money, could only find in the example of the United States encouragement to aid in the appreciation of the half of their total circulating money, and that they would also reopen their mints. He must also concede that to sell any of the silver now in the form of coin would sacrifice 30 to 40 per cent of its money value, and to sell silver in the form of jewelry, plate, etc., would be to sacrifice from 100 to 1000 per cent of its art value.

Coal Supply.

California is, unfortunately, very scantily supplied with coal. The Mount Diablo mines are the only ones which ever produced any quantity, and that was inferior. Since the supply from these was lessened, we have received large quantities from Oregon and Washington, but most of that used here comes from Australia and England.

The Southern Pacific Co., in addition to its Carbon Hill mine, has lately opened a big mine on Vancouver island, 60 miles from the famous Wellington mine. A steamer with 4300 tons of this coal aboard is now on the way here, and two more steam colliers, each carrying 4000 tons, will follow her. These three vessels will hereafter be employed in bringing this coal to San Francisco, so the Southern Pacific Co. will no longer need to buy Australian or English coal.

In speaking of the importance of this change to a reporter, Colonel Crocker says: "My business at Vancouver this trip was almost exclusively looking after the development of our coal mines there, and I arranged to supply all of our engines and ships. Since the Mt. Diablo coal mine closed down nearly all of the coal used in this State has been imported from Australia and England. The sum that the Southern Pacific Company alone has sent out of the country for coal has been enormous. Hereafter that money will be kept in our own hands. There are several reasons for our making special efforts to get a permanent source of coal supply in our own hands and by water communication. The coal from the Ione mine is only used on the engine that runs to Galt and at some few pumping stations. It is not a strong coal, but will do for a few purposes. Coal from the great Rocky Mountain Coal and Iron Co.'s mine at Almy, in Wyoming Territory, is of good quality, but it does not pay to bring it here by rail."

Bullion by Express.

It was stated recently that Wells, Fargo & Co. had closed their office at Hildreth, Toll House and elsewhere in Fresno county, and would close their other offices in other mining camps, owing to frequent robberies. It seems, however, that the change referred to only particular localities and was not general. The superintendent says:

"We may have to close other offices in the future for the same reason that we closed these, but I don't know of any that are likely to be closed besides those at the present time. The losses at those places were in excess of the receipts, so we shut down. We could not secure the assistance of the people of those districts to convict the numerous stage robbers that were brought to justice, and as the business did not pay we stopped it. We will stop in other places if the same thing happens. It does not pay to carry treasure in districts where it is not considered a crime to rob an express company, but the papers are mistaken in saying that we intended to discontinue our mountain service altogether. On most of the routes the treasure business is quite satisfactory."

EUGENE N. ROBINSON, a very active mining man, lately engaged in operations at Seligman, Nev., died in New York last week.

GOOD sandstone has been found near the Santa Rita ranch, four miles from Lompoc.

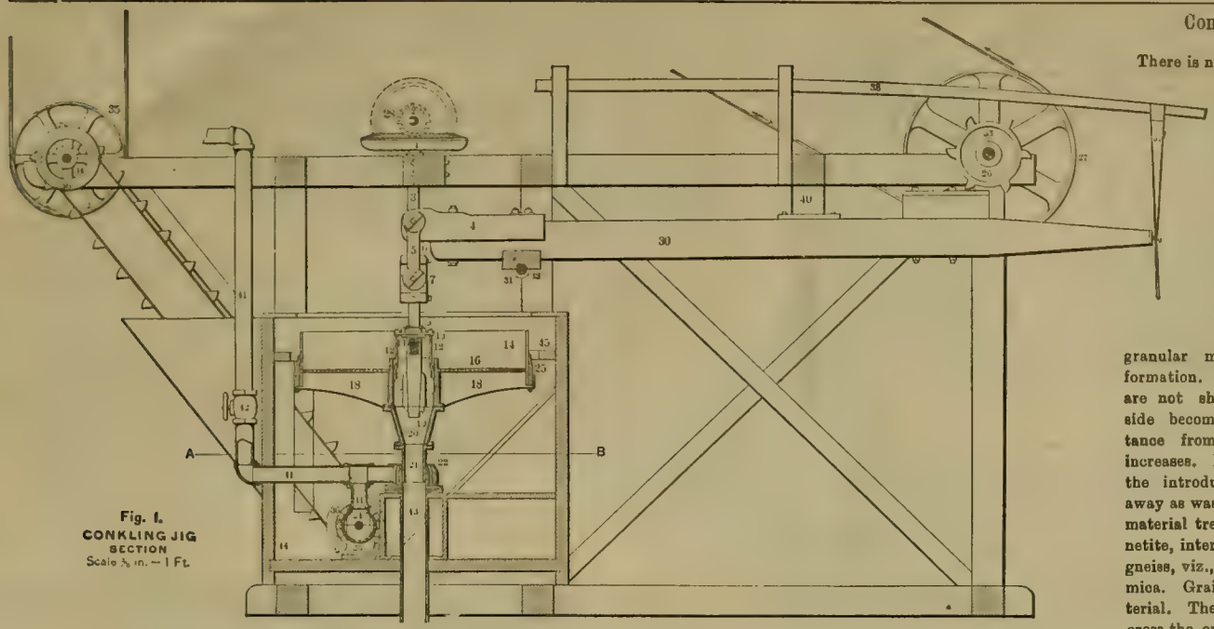


Fig. 1.
CONKLING JIG
SECTION
Scale ⅜ in. = 1 Ft.

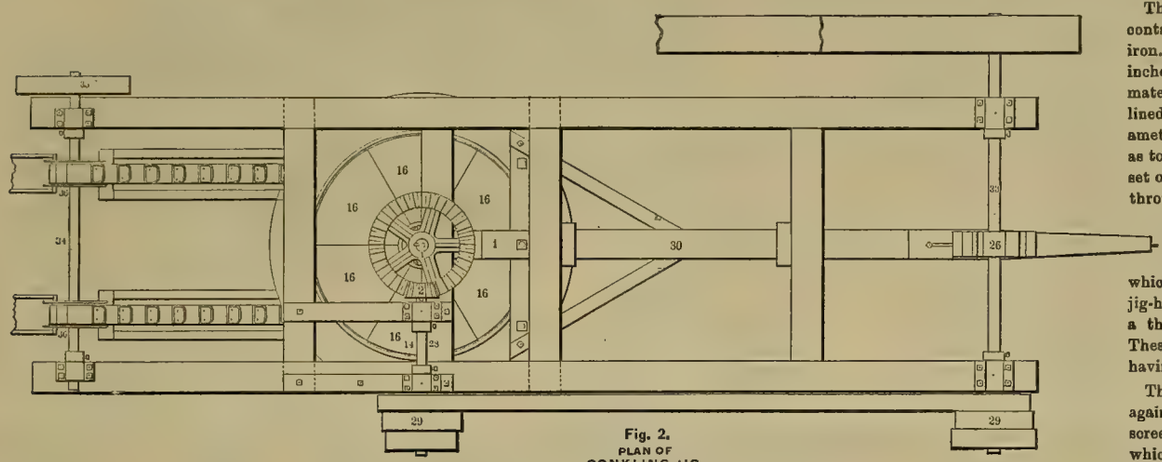
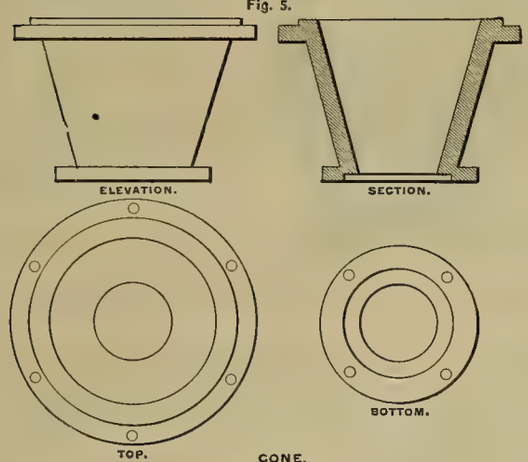


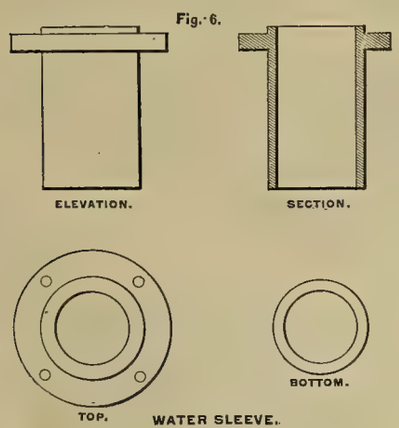
Fig. 2.
PLAN OF
CONKLING JIG.
Scale ⅜ in. = 1 Ft

Fig. 5.



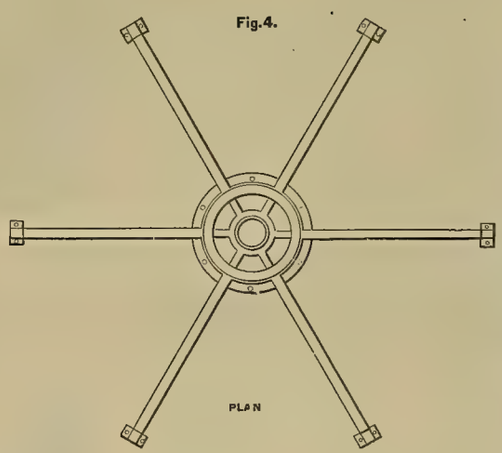
CONE.
Scale: 1½ in. = 1 ft.

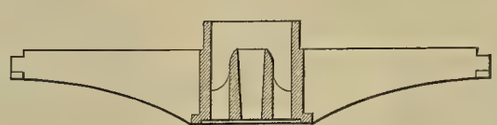
Fig. 6.

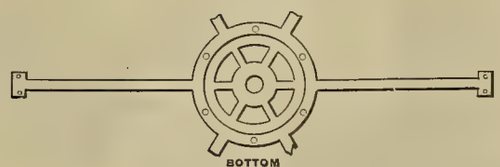


WATER SLEEVE.
Scale: 1½ in. = 1 ft.

Fig. 4.







SPIDER
Scale ¾ in. = 1 ft.

THE CONKLING JIG FOR CONCENTRATING MAGNETITE.

Concentrating Magnetite.

There is now in use at the mines of the Chateaugay Ore and Iron Co., at Lyon Mountain, N. Y., an ore-concentrating machine or jig, for concentrating lean ores of iron.

The Conkling jig is an adaptation of old forms, but there are several points which deserve attention, particularly the method of central discharge, of freeing the bearings from grit, and the rotation of the sieve or screen. The ore-body at Lyon Mountain consists of a bed of rather compact, granular magnetite, occurring in a gneiss formation. The side walls of the ore-body are not sharply defined, the ore on either side becoming gradually poorer as the distance from the central point of the body increases. It is this lean ore, which, before the introduction of the jigs, was thrown away as waste, that is now concentrated. The material treated consequently consists of magnetite, intermixed with the component parts of gneiss, viz., quartz, felspar, hornblende, and mica. Grains of trap also form part of this material. These come from dykes of trap, which cross the ore-body at intervals.

The ore which is to be concentrated usually contains from 30 to 40 per cent of metallic iron. It is first crushed to the size of two inches, or less, by two large Blake crushers. The material from these crushers passes by a shute lined with screens, having holes ⅝ inches in diameter, to a second set of four crushers, set so as to close to one inch. The product from this set of crushers, together with that which passes through the screens in the shute, is then taken by an elevator to the top of the mill, and passed through a revolving screen, perforated with ½-inch holes. The ore which passes *through* the screen goes to the jig-hoppers; that which passes *over* goes to a third set of six crushers, set to ½-inch. These are of the Blake multiple-jaw pattern, having three jaws.

The product from these third crushers is again screened through a double revolving screen, having holes ½-inch in diameter, that which passes through goes to hoppers; what passes over goes to a fourth set of crushers. These are of the Blake multiple-jaw pattern, having six jaws, which are set so as to close to ¼-inch. The product from these last crushers is again screened, and the grains which are still too large pass again through the final crushers. All the material which passes through the ¼-inch holes goes to the jigs without further sizing. The ore is crushed dry, and goes to the jigs in that State.

The machine, as shown in the accompanying drawings, may be divided into four essential parts: 1—the frame; 2—the tub; 3—the jig; 4—the elevators. For the better understanding of the drawings, the following index of the names of the parts is appended, the numbers referring to corresponding numbers in Figs. 1 and 2: 1—bevel-wheel; 2—pinion; 3—upright shaft; 4—shoe; 5—link; 6—upper collar; 7—trunnion piece; 8—lower collar; 9—outside nut; 10—flange; 11—inside nut; 12—standard; 14—hoop; 16—screen-plates; 18—spider; 19—key; 20—cone; 21—water-sleeve; 22—water-box; 23—lower elevator-box; 24—lower elevator-shaft; 25—band arms; 26—cam-wheel; 27—36-inch pulley; 28—pinion shaft; 29—cone pulleys; 30—lever beam; 31—yokes; 32—lever-shaft; 33—driving-shaft; 34—top elevator-shaft; 35—24-inch pulley; 36—flange-pulleys; 37—cone-pulleys; 38—spring pole; 39—strap; 40—bumper; 41—3-inch water-pipe; 42—regulating valve; 43—outlet pipe to tail race; 44 tub; 45—splash rim.

The frame, which is shown in vertical section and elevation in Fig. 1 and in plan in Fig. 2, is made of squared spruce or hemlock timber, 6½x6½ inches, and braced by cross-bracing 3x4 inches, at the sides and ends. The frame is 4 feet 1 inch wide. There is an upper and a lower cross-piece at each pair of uprights, except at rear, where the cross-piece is placed 3 feet 8 inches from the rear end of the string-piece. To the lower side of the cross-piece is attached the bumper for the lever beam. The main driving-shaft is placed directly over the rear uprights, and 9 inches from the forward end of the string-pieces is placed the shaft for the elevator pulleys. Between the first and

second cross-pieces is a cross-beam which carries the journal for the upright or jig-shaft. The front edge of this timber is set even with the center-line of the jig. From this timber to the forward cross-piece extend two timbers, 4x6 inches, as shown in Fig. 2, which carry the boxes for the pinion shaft. To the second and rear cross-pieces are bolted pieces, 3x9 inches, and 2 feet high, which carry the spring-pole. On the front of the second pair of uprights, 1 foot 6½ inches (to center) below the string-piece, are the journals which carry the lever-shaft. The tub is of yellow pine, 4 feet 11 inches inside diameter. The staves are 4 feet 8 inches high, 5 inches wide and 2 inches thick. The staves are not divided. A door in the side gives access to the interior. The tub is set between the first and second pair of uprights, as shown in the drawing.

The jig consists essentially of a circular sleeve, suspended from one end of a lever, being moved up and down by a cam striking the opposite end of the lever. The concentrates pass through the sieve to the bottom of the tub; and the tails pass out by means of an annular opening around the jig-shaft. The general arrangement is shown in Fig. 2. Of the original cuts we omit Fig. 2; and Fig. 4 represents the "spider." In Fig. 5 is shown the cone and Fig. 6 is the water sleeve. This water sleeve slides up and down in the water box. All the water which is used in jigging passes through this box.

This description we take from a paper read before the American Institute of American Engineers, by F. S. Ruttmann. In next week's PRESS we shall continue the description.

SHOP NOTES.

Productive Efficiency of Shops.

It takes a constant spirit of progressiveness to keep a machine shop up to the times in the way of tools. And unless this is done the shop soon becomes "old." And the character of the tools in a shop is very likely to be reflected in the men. Good mechanics like to work with good tools, and are very likely to go where the can find them. A man who expects to spend the best part of his time in a shop will, if he is the right kind of a man, want his surroundings reasonably pleasant. Altogether, the old shop, with the old tools, is in a bad way. But it is not beyond redemption. New tools were never so cheap as at present, and they will go right along paying for themselves. Cranes and labor-saving appliances, with good tools, will make an old shop a new one. The trouble of getting rid of old tools seems to be that they stand something in the relation of old friends. Who ever heard of an old planer or lathe being put through the cupola, even when it would thus be doing the most good?

Again, time was when but little attention was paid to the construction of machine shops, except to get about so much ground covered, with the vague idea that the tools would find their places somehow. The outcome of this may be seen in the peculiar quality of unhandiness pertaining to many shops in this country. There is a vague understanding that unhandy shops are in some degree a hinderance to production; but just to what extent this is true is something that but little is known about, hence the following instance—which we have on undoubted authority—is of peculiar significance: A firm employing about 350 men, recently built new shops—machine shop, boiler shop and foundry—and moved the tools from the old shops into the new ones. No new tools were added, but there was a better arrangement of the tools, and overhead cranes were put in the new shops. The general arrangement was such as called for less handling of material, and also such that the necessary handling could be done more expeditiously. The result was an increase in productive efficiency of 25 per cent. This represents a large saving, and goes to show that the loss in shops, not properly constructed for the work to be done, is greater than it is generally believed to be.

The whole question of shop construction is one that could profitably be studied much more than it is. It is better not to build the new shop so soon, by a year or two, than to build it in a way it ought not to be built.

A great deal more attention is given now-a-days than formerly to what a well-known engineer calls "shopitecture," but the subject does not yet, in the majority of instances, receive the attention it deserves. There are many things to be considered, and some of them are likely to be slighted. It pays to put a good deal of thought into the construction of what is likely to vex or please the builder for the remainder of his life. If all shops were about equally unhandy, it would not matter much in the question of competition, but when one's neighber has a good deal the advantage in this respect, it matters very materially.—*American Machinist.*

A NEW LUBRICANT.—The *British Trade Journal* of London says that the Messrs. Gebruder Born (presumably of London) have hit upon a new use for mustard oil, which they have manufactured for a number of years for culinary purposes. Experiencing difficulty in reducing the heat of a bearing which other lubricants were powerless to affect, the firm's engineer applied a quantity of their mustard oil, and with the most satisfactory results. It was then used upon other bearings by way of experiment, and a test having been made by one of Messrs. W. H. Bailey & Co.'s machines, it was found that the percentage of fat in mustard oil, compared with olive oil, is 263 to 168, and as compared with naphtha as 263 to 125. It is found that the new lubricant retains its consistency even when the temperature is seven or eight degrees Reamur below zero. It can also be kept for years without becoming rancid or losing its lubricating quality, even should it come into contact with the atmosphere. Hence it differs very much from all other vegetable oils and lubricants, which generate destructive acids if kept for a time or exposed to the air.

A Valuable Calculating Rule.

The *Engineer* (London) describes a new calculating rule made by J. Davis & Sons, London, which seems to be a considerable improvement upon the ordinary slide rule. It is of the Grant type, ten seconds long, of wood into which are fitted strips of hard white culluloid, on which the graduations are placed, the lines being black. The strips are said to be entirely without relative change in varying temperature, and a degree of accuracy is obtained superior to what has heretofore been accomplished. The calculations that may be performed by the aid of this rule are endless in number. In addition to the ordinary processes of multiplication, division, evolution and involution, it may be used for a variety of technical calculations in which its use effects an enormous saving of time. Thus the engineer may compute the strength of beams, moments of inertia, horse-power of engines, hydraulic formula, areas of circles and ellipses, cubic contents, weights, conversion of British into metric or other systems of measurement, without putting down a single intermediate quantity. The electrical engineer may solve all problems involving the application of Ohm's law of the relation between current, electromotive force and resistance. The surveyor may plot surveys by rectangular co-ordinates and set out curves. The chemist is enabled by its aid to calculate percentage compositions rapidly. The mode of using the slide rule may be learned by any one with no mathematical training in a very short time, and rapidity and accuracy are merely matters of practice. As the results obtained are quite accurate enough for practical work, the slide rule, now that it can be obtained at a moderate price, cannot fail to come into more extended use among engineers, electricians, chemists, and all to whom saving of time and of mental effort is of importance. No one who has once learned the use of this kind of rule will ever go through the laborious work of any calculations by the ordinary methode.

LUBRICATING OILS.—It is a mystery that men who are called upon to use lubricating oils—that is, to do the work of using them—can never understand why, when an oil has been found just right for the purpose for which it is intended, a change is made by those who control the purchasing power. Valuable machinery is often sadly damaged by such changes. The highest priced oil is not always the best, but the best of common oils is generally the cheapest. When a large quantity of machinery is operated, the quality of the oil used often has an important bearing on the amount of coal burned, and sometimes the rapid destruction of delicate machinery more than overbalances the cost of both coal and oil. The reason, sometimes, why a change of oil is made when the quality is in every way satisfactory, is that the new "oil man" has an insinuating way with him that captivates the purchaser, and sometimes, alas! the purchasing agent is captured by other means. There are reputable dealers in oils who, a quality having by experiment been found that is best for the purpose, undertake to furnish it of a standard grade as long as desired. Lubricating oils are, at the present day, very commonly a compound of animal and mineral oils, and vary quite widely as compounded for different purposes. Many dealers have been to considerable trouble and expense in getting at the best mixtures, and can frequently give good advice when the purpose for which the oil is to be used is known to them.—*Ex.*

WASH-ROOMS VS. PAILS.—In building a new shop, the question, "Where shall the men wash?" is pretty sure to come up, especially if the shop is to be in a large city, where space is valuable. We all know what the old way is—pails under the benches, under the lathes and under everybody's feet. Some shops, seeing the evils of this old way, set aside one room for washing purposes, and allow no pails whatever in the shop. Everything necessary is provided in the room, the principal fixtures usually consisting of long sinks filled with water, which are used by the men in common. The principal objection to this scheme from the employer's standpoint, is, that it occupies considerable room which is often valuable, and might be advantageously used for other purposes, and it is also likely that some of the workmen might have preferences for places of their own, rather than use a sink in common with all. The problem may be a somewhat difficult one to solve in many cases; but it should be so solved, in every instance, that convenient and cleanly conveniences of this kind should be furnished to all the workmen in every shop.

MECHANICAL TRAINING.—The scheme for the training of mechanics approved by the Master Builders' Exchange of Philadelphia, provides for the education of boys in a mechanical trade school until they have obtained a certificate of proficiency and a service for a term of practice with an employer, this term to be at least one year less than the usual term of apprenticeship by virtue of the holding of a certificate of proficiency granted by a mechanical trade school. The completion of the education of the mechanic is to be acknowledged on the part of the employer by the granting of a certificate from the association of builders, setting forth that the holder has passed through the prescribed course at the trade school and the term of practice with an employer, and is entitled to be received by all builders as a journeyman. With similar schools established in New York, Philadelphia and Boston, this system will, it is believed, in time afford a substitute in part for the old form of apprenticeship, and be of advantage to both the young men and their employers.—*Ex.*

Ready-Made Houses.

We have been requested to give the address of a firm in this city, or elsewhere in the State, that sells cottages in sections. Our correspondent thinks that such buildings were made some years ago in the redwoods and that there was an agency here for their sale.

We do not know of any concern that is furnishing them, but would be glad of information on the subject. We think it would be well if more attention were paid to the manufacture of portable houses.

THE Bakersfield *Echo* says: The green sandstone found near the Southern Pacific railroad in this county is the finest in the State. The esthetic city of Pasadena thought it good enough for its library building and used it for that purpose. A small capital could find lucrative employment in working quarries of this stone.

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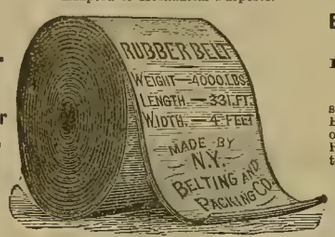
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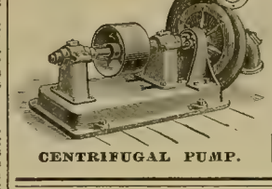
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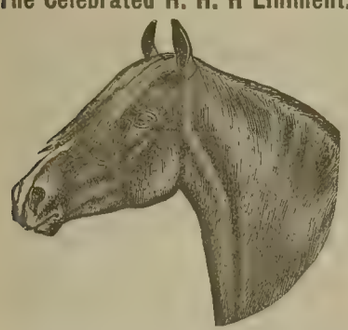
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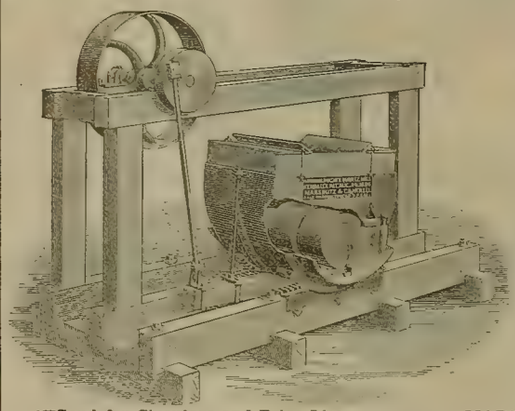
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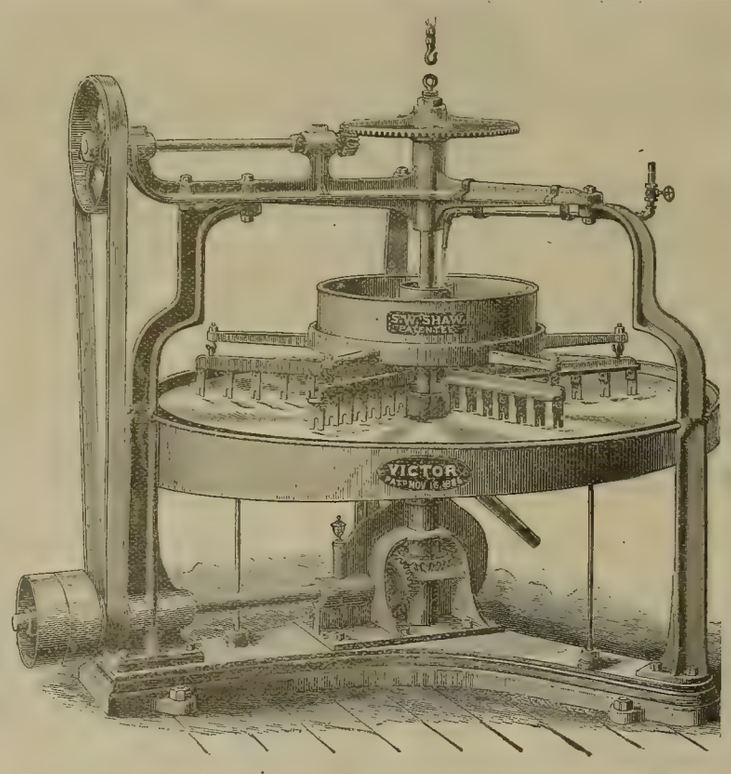
NATIONAL ROCKER QUARTZ MILL.
KENDALL'S PATENT, AUGUST 24, 1886.
CAPACITY, 12 Tons in 24 Hours. 3 H. P.
MARSHUTZ & CANTRELL, Sole Manufacturers.



The Patentee and Manufacturers cordially invite miners to critically examine and pass judgment upon this improved system of milling and amalgamating ores in the following particulars:
1. The cost is less than one-half of stamps of same capacity.
2. The freight to mine is less than one-half of stamps.
3. The cost of erecting is less than one-fourth of stamps.
4. The power to drive it is less than one-half of stamps.
5. The wear is less than one-quarter of stamps.
6. There is no wear except on shoes and dies.
7. In point of amalgamation it is superior to any other machine in use.
8. In its simplicity of construction.

We challenge competition with Stamps, Ball Pulverizers or and other ore crushing machines now before the public.

☞Send for Circulars and Price List. MARSHUTZ & CANTRELL.



THE VICTOR CONCENTRATOR
Having passed the experimental stage, is now offered to the consideration of the mining public, in full confidence that it will meet satisfactorily all reasonable requirements. In operation it is unlike any other machine of its class. The concave disc having a rotary reciprocal motion, causing the waste sands to flow over its periphery continuously, while the sulphurets are also drawn continuously through its center, the whole process being automatic and complete. The Batea in the hands of an expert is known to be the nearest to perfection for concentration. This is the principle upon which this machine works. The advantages gained are:
1. Greater capacity with more perfect work.
2. Simplicity of construction and management.
3. When used as an amalgamator it has no equal.
4. The first cost is less than other machines of much less capacity.
5. The shipping weight is less than 1000 pounds.

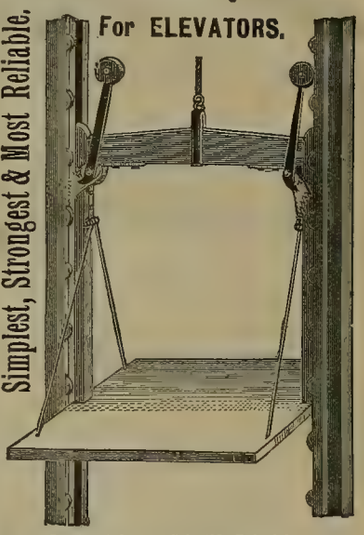
Mine owners and millmen are invited to carefully examine the Victor before deciding upon their concentrating works. Address
S. W. SHAW, or N. W. SPAULDING,
17 and 19 Fremont Street, SAN FRANCISCO.

INVENTORS, TAKE NOTICE!
L. PETERSON, MODEL MAKER,
258 Market St., N. E. cor. Front (up stairs), San Francisco. Experimental machinery and all kinds of models. Tin and brasswork. All communications *strictly confidential.*

This paper is printed with Ink Manufactured by Charles Eneu Johnson & Co., 500 South 10th St., Philadelphia. Branch Offices—47 Rose St., New York, and 40 La Salle St., Chicago. Agent for the Pacific Coast—Joseph H. Dorety, 529 Commercial St., S. F.

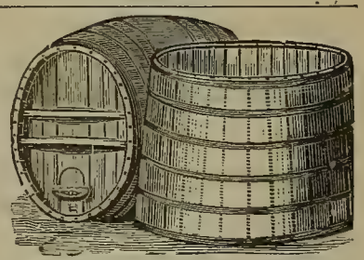
B. E. HENRIKSEN'S
PATENT
Automatic Safety Clutch
For ELEVATORS.

Simplest, Strongest & Most Reliable.



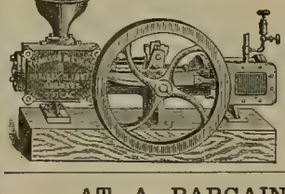
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Operates and Sets Automatically and Ever Ready for Service.

Entirely free from all springs, pawls, triggers, governors and other unreliable parts likely to stiffen, corrode or gum up.
ALWAYS IN FULL SIGHT, BUT NEVER REQUIRING ANY ATTENTION.
Has been practically tested in six actual elevator accidents and saved 51 persons from injuries and death.
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ALL KINDS OF CASKS, TANKS, Etc.
☞SHIP, MINING, and WATER TANKS a Specialty.☜

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(Successors to THOMSON & EVANS),
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MACHINE WORKS,
Steam Pumps, Steam Engines
and all kinds of MACHINERY.



DEEP WELL PUMPS

AT A BARGAIN.
A 20-STAMP
Dry Crushing Silver Mill,
With Furnace, Dryer, Pans, Settlers, Steam Power, etc., complete. New and of latest pattern. Can be changed to Wet Crushing if desired. Apply to
PACIFIC IRON WORKS,
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No. 25 Bond St.,
NEW YORK.
ESTABLISHED 1859.
PLATINUM
FOR ALL
Laboratory
—AND—
Manufacturing Purposes.
Wholesale and Retail.
Native Platinum and Scrap purchased.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

From the official report of U. S. Patents in DEWEY & Co.'s Patent Office Library, 220 Market St., S. F.

FOR WEEK ENDING JUNE 25, 1889.

405,951.—STORE SERVICE APPARATUS—Percy L. Davis, S. F.

405,957.—FISHING NET—H. E. Freyschlag, San Jose, Cal.

405,772.—GATE—G. Guibbini, Point Reyes, Cal.

405,778.—FRAME FOR ILLUMINATING TILES—P. H. Jackson, S. F.

405,890.—FENCE MACHINE—J. M. Keith, Albany, Ogn.

405,715.—MUSIC STAND AND PORTFOLIO—Viola Moore, S. F.

405,699.—EXTENSION LADDER—W. S. Odle, Los Angeles, Cal.

405,798.—BRAKE ROD ATTACHMENT—N. C. Price, Pocatello, I. T.

405,800.—FINISHING ARTIFICIAL STONE SURFACES—E. L. Ransome, S. F.

405,744.—WIRE ROPE MACHINE—Henry Root, S. F.

406,009.—FIRE GRATE—H. Sutcliffe, Oakland, Cal.

The following brief list by telegraph, for June 25th, will appear more complete on receipt of mail advices:

California—Henry T. Welch, San Jose, inhaler; James C. Weir, San Francisco, ball castor; the same, metal corner-piece for boxes; John H. Ware, Eureka, mop grip; William Lamb, Downey, cooking stove; Elijah S. Gilmore, assignor of two-thirds to N. W. Spaulding, San Francisco, band sawing machine; the same, saw-regulating attachment gear for band sawing machines; Miles B. Dodge, assignor to Parke & Lacey, San Francisco, ore concentrator; Jeremiah E. Day, assignor of one-half to J. Pracy, San Francisco, well-boring apparatus; Harry B. Belden and M. A. Taylor, Oakland, casket pedestals; Adolph V. Anderson, San Francisco, pipe cutter.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

GATE.—Gottardo Guibbini, Point Reyes, Marin Co. No. 405,772. Dated June 25, 1889. This invention relates to that class of gates which are opened and closed by the passage of the vehicle over loops which project above the surface of the roadway in the vicinity of the gate. It consists in certain constructions and combinations of devices to make a simple practical gate.

FRAME FOR ILLUMINATING TILE.—P. H. Jackson, S. F. No. 405,778. Dated June 25 1889. It is usual to make illuminating tiles with heavy cast-iron sash frames glazed with thick glass, and, where a number are together, to prevent leak at the joints between the tiles, and to support their sides, bearers are used, secured to the sides of the tile-frames, the seam between the tiles being filled with cementing material. Wrought-iron frames are also used, made of several pieces riveted together and the spaces filled with cementing material; but these are quite expensive of construction, which is also the case with cast-iron frames on account of the cost of patterns and the continual alteration of the same to suit different lengths and the various outlines of buildings where they are to be used, and to be of equal strength with wrought-iron frames, they must be made much heavier and be supported by bearers, which causes an additional expense. Mr. Jackson's patent covers a peculiar construction and arrangement of sash-bars wherein the glass is to be held between said bars.

STORE-SERVICE APPARATUS.—Percy L. Davis, S. F. No. 405,951. Dated June 25, 1889. This invention relates to that class of store-service apparatus in which a number of track-lines proceed from the various sales counters to the wrapping or packing desk or platform, said track-lines being adapted to be moved to an inclination by the salesman at the counter, whereby the parcel carriage or basket is adapted to roll by gravity upon the track-lines from the sales counter to the wrapping platform and back again, according to the inclination of the lines. The invention consists in a novel mechanism for automatically holding the track-lines at the proper inclination to enable the parcel carriage or basket to travel from the sales counter to the wrapping platform and relieving said track-lines so that they may return to the opposite inclination to enable the parcel carriage to return to the sales counter. The object is to relieve the salesman from the necessity of holding the track-line in its elevated position during the time while the parcel carriage is traveling to the wrapping counter. By this invention the track-line is automatically caught and held in an elevated position, so that the salesman, after raising it, need pay no further immediate attention to it, and as soon as the carriage is ready to be returned, the clerk at the wrapping counter releases the track-line and allows it to drop again to its downward inclination enabling the carriage or basket to return.

THE new saw-mill at East Fork, Trinity county, will be very useful in that camp.

Coast Industrial Notes.

THE Pioneer tannery at Benicia was burned on June 25th. It was one of the largest and best equipped tanneries in the State.

AT the new West Coast Lumber Co., San Diego, they are now provided with arrangements for furnishing kiln-dried lumber.

THE Fresno *Republican* says Fresno county has enough iron ore in sight to duplicate all the navies in the world. If this is so the mountain railroad should be built as soon as possible, for it certainly would be better to use California iron than ship it 2000 miles.

THE National City *Record* says that another great water scheme is on foot. A big dam is to be built across San Felipe canyon to store water for irrigating a portion of the Colorado desert. Thousands of acres of otherwise worthless land may be made valuable.

THE Livermore *Herald* says: The first chrome of the present season came into town last Tuesday, and two teams are now engaged in hauling. This number will be increased, as there is already a hundred tons of ore on the dump, awaiting shipment. The ore will go around Cape Horn.

A NEW sawmill is being built at Caspar, Mendocino Co., to replace the one recently burned. They have been lumbering at this place for very many years. The railroad built a few years since, however, opened up an extensive belt of timber which the new mill will work up.

AS a reason for going out of business, one of the proprietors of the Pioneer Woolen Mills of this city, says: "The simple truth is that the business don't pay and it has not paid for five years. We have been engaged exclusively in the manufacture of coarse goods, and we are too far from the center of population to hope to succeed, so we will settle our debts and go out of business."

THE Pearl Shell Co. has about 300 men engaged in diving for pearls in the pearl zones of the Gulf of California. The Mexican Government allows the company to work in each zone only once in two years. The two-year-old oyster has the best and the greatest number of pearls. A German merchant on the gulf coast bought $50,000 worth of the iridescent beauties last year for the European market.

AT Hall Bros.' shipyard, at Port Blakeley, the four-masted schooner Golden Horn is being built and is almost ready to be launched. The schooner's dimensions are: Length, 185 feet; beam, 58½; depth of hold, 14; gross tonnage, 669; net, 664 tons. This is the sixtieth vessel built by Hall Bros. since their location on the sound. When finished, the Golden Horn will carry from 90,000 to 1,000,000 feet of lumber.

THE Willows (Colusa Co.) *Gazette* says: "Alex. Chapman is in from the Sanhedrian mill and reports that all is running along smoothly. At the present time and until the machinery is in place, all hands have been laid off. He informs us that the first lumber will be cut in about two weeks. When completed the mill will be the finest in the country. Besides sawing lumber into lengths, there will be a complete box factory, shingle machine, etc. It is what has been needed in this country for a long time."

WORK is going on to open the oil springs at Montecito, Santa Barbara county. These springs are not a recent find, as they have been known by a few for ten years. The owners of the land, Col. Reed, John Laughlin and Charles and Douglass Swift, have at different times endeavored to increase the flow of oil by tunneling, but they were unable to do more than to penetrate the rock a few feet. In one of their attempted tunnels is now accumulated twenty or thirty barrels of a thick tar like oil, while the thin oil finds an escape through the mass of broken rock that partially closes the mouth of the tunnel. The Occidental Mining and Petroleum Company, of Santa Barbara, has leased the property for a term of years, and intends to proceed at once to the development of the springs.

ABOUT a month ago the employes of the Napa woolen mills petitioned the manager to reduce the hours of work from 11 to 10 per day. After consideration by the directors and manager of the mill, it was determined to grant the request, but as the profits of the mill did not warrant paying the present wages for the reduced hours of work, it was decided to reduce wages in proportion to the reduction of time. Notice was given the help that on July 1st the mill would shut down for one week, after which only 60 hours of work per week would be required, and each employe was told what wages would be paid him on the new time schedule. According to the notice given, the mill was shut down this week. The manager says they will be ready to start again Monday, July 8th, and that he expects most of the help will return to work, though a few of the hands say they will not accept the reduced schedule. The mill has been running about four years, and has not yet paid its stockholders one dollar in dividends.

State Mining Bureau.

The following are among the recent contributions to the museum of the State Mining Bureau:

Silver ore from Best Chance mine, Minarets Buttes, Fresno county, Cal. This is the new camp known as the Minarets; the ore is represented to be in immense quantities, but is very base, containing, besides the silver, galena, copper, antimony, zinc blende, iron, arsenical pyrite, etc. Fred Barcroft.

Marble; polished slab from Fair Play, El Dorado county, Cal., which has been exposed to the weather 25 years and still retains its polish. There is said to be a large body of similar quality in the vicinity. This is from Jas. A. Scott.

Menaccanite, a fine specimen from Chiquemula district, Guatemala. M. San Pedro.

Epidote; large and handsome specimen from Eber Flat, Tulare county, Cal. J. W. Donelly.

Tin ore, a fine specimen, Wheal Vore, Cornwall, England. J. F. Cox.

Barite, Callahan's Ranch, Siskiyou county, Cal.; occurs associated with argentiferous galena. J. F. O'Gorman.

Halotrichite, in beautiful silky fibers, old Eureka tunnel, Livermore, Alameda county, Cal. D. Gutmann.

Alunogen, San Diego county, Cal.; could be used for making alum. A. C. Taylor.

Gold quartz, Ribbon Rock mine, near Columbia, Tuolumne county, Cal. W. O. Bowers. Assay, $600 to the ton.

Gold quartz, showing free gold; Pet vein, Crescent mine, Crescent Mills, Plumas county, Cal. Capt. J. M. McDonald.

Gold quartz; Gold Run mine, Ætna, Siskiyou county, Cal. From the company.

Gold in calcite; Alvord mine, Camp Cady, San Bernardino county, Cal. W. L. Newman.

Seventeen specimens rare minerals from Eastern States and Europe.

Gold quartz, rich in free gold; Gold Canyon, Sierra county, Cal. R. D. McKillican.

Series of 20 specimens illustrating the smelting process of reduction of base ores at the Hanauer works, Salt Lake City, Utah. From the company.

Twenty-two ethnographical specimens, Indian stone implements, crude pottery, etc., Tulare county, Cal. J. Z Davis.

Series of specimens of gold quartz with accompanying wallrocks from mines in El Dorado and Nevada counties, Cal.

Twelve specimens, chiefly silver ores from the Bocaneme mines, U. S. of Colombia, South America. D. T. Hughes.

Very fine specimen of pearl spar (dolomite) on calcite, Durham, England. J. W. Foss.

A number of very rich specimens of tin ore and accompanying minerals from the Harney Peak Tin M. Co., Dakota. Per Richard D. Atkins.

Auriferous conglomerate, locally called "banket," Witwatersrand, Transvaal, South Africa. R. D. Atkins.

Gold quartz; Sheba mine, De Kaap district, Transvaal, South Africa. Average over ten ounces to the ton. R. D. Atkins.

Lepidolite; San Diego, Cal. Exists in large quantity. R. Garvey.

Six specimens rich silver ore from New Mexico. C. H. Laidlaw.

THE NEW COMET.—Prof. Holden writes from the Lick Observatory as follows: Mr. Leuschner, a student in the observatory, has computed the orbit of the comet discovered here on June 23d by Mr. Barnard. He finds that this faint comet was already past its perihelion when it was discovered. It was nearest to the sun on June 20th. If the brightness of the comet on June 23d be taken as 100, its brightness on June 29th was 92, and on July 12th it will be only 76, so that this comet, like so many others, will never become visible to the naked eye. On June 23d the comet was 102,000,000 miles from the sun (the earth's distance is about 93,000,000), and at the same distance from the earth. On July 12th its distance from the sun will have increased to 107,000,000 miles, and from the earth to 114,000,000. Its positions are: July 7th, R. A. 2 hours 24 minutes north; declination, 45° 11'; July 11th, R. A. 2 hours 43 minutes north; declination, 46° 27'. The comet is too faint to allow the use of the spectroscope to analyze its light, so that almost its whole history is given above.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. C. HOAG—San Francisco.
R. G. BAILEY—San Francisco.
W. E. BECK—San Francisco.
WM. H. COOK—Fresno and Santa Cruz Cos.
W. W. THROBALDS—Central California.
H. G. PARSONS—Central California.
GEO WILSON—Sacramento Co.
FRANK S. CHAPIN—Colusa and Butte Cos.
E. H. SCHAEFFLE—Calaveras and Tuolumne Cos.
DR. W. F. DRAKE—Sonora, Cal.
CHAS. DUGAN—Stanislaus Co.
A. F. JEWETT—Tulare Co.
E. W. HAMLIN—Alameda Co.
JULES BAUMANN—Arizona.
CHAS. F. BLACKBURN—Idaho.
R. G. HUSTON—Montana.

THE Bridge and Building Department of the Central Pacific has been awarded the woodwork for the Stanford University. This work is all in hard wood, and will give employment to 350 mechanics of Oakland for the next three and a half years.

Mining Share Market.

The market for the Comstocks, the past week, was quite active with Ophir and Mexican the leaders. This first-named stock advanced from $4, its low figure, to $6, when it fell back to $5. At the close it has a strong advancing tendency. The rest of the Comstocks moved slightly in sympathy. The general feeling on the street is still of a bearish character, and when prices moved up there were free realizing sales, under the belief that before the close of next week a low range of prices will obtain. Although the general feeling is bearish, yet there are many of the heretofore more pronounced bears, who are hedging and gradually changing to the bull side. This changing of heart is said to be due to heavy sales of stock by the outside public, and its absorption by the pool, and also to the important character of the work now going on towards the west in the mines of the Gould Hill, Middle and North End groups. The best informed say they can not tell how soon any important developments will be made, yet they are under the impression that it will be several weeks, and in the meantime stocks may have quite a decided move up, but what on they profess ignorance. While the work in the mines deserve careful study yet to outsiders it is dangerous to buy and sell stock on, for the mines are often, but not always, one thing and the stocks under manipulation quite another. In outside stocks trading the past week was quiet with the market heavy, for prices generally crawfished while the Comstocks advanced, and with the latter breaking the former, outside of the Tuscaroras, set back still more. There appears to be more quiet hopeful talk regarding outside stocks, but about all dealers think they must go lower before they can buy for much of a move. Although we are not advised by reliable parties from the mines, yet there are usually well informed parties in this city who are more hopeful of the future of the work going on in some of the Quijotoas, Tuscaroras and Bodies. Their information from the mines, they claim, points to better results in the near future; yet until we are further advised we only give the above as reports from heretofore well informed parties.

The adjournment of the two stock boards from to-day at noon until Monday at 11 o'clock A. M., interfered to some extent with the volume of business transacted.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

BUCKEYE M. CO., June 29. Location, Lyon Co., Nev. Capital stock, $2,000,000. Directors—D. W. Balch, F. D. Culver, J. H. Burlong, J. W. Classen and F. M. Johnson.

RAPID SAFETY FILTER CO., June 29. Capital stock, $500,000. Directors—C. L. Ackerman, T. J. Craig, Moses Deutch, H. S. Hunt and W. D. Mansfield.

GOLDEN GATE SAFETY FAUCET CO., July 1. Object, to supply such articles and fittings as are used in handling liquid in barrels and casks. Capital stock, $100,000. Directors, Mark Anthony, L. B. Booth, W. C. Savage, W. J. Bowman and Augustus Quade.

MUTUAL MANUFACTURING CO., July 1. Capital stock, $100,000. Directors—A. Burdel, C. W. Wright, L. Maas, W. F. Mau and E. H. Morgan.

PACIFIC TELEPHONE CO., July 1. Object, to deal in telephones and telegraph appliances. Capital stock, $5,000,000. Directors—Lloyd Tevis, W. H. Forbes, Geo. S. Ladd, E. S. Pillsbury, Samuel Hubbard, W. F. Goad and W. C. Gibbs.

CALIFORNIA ENGINEERING CO., July 2. Capital stock, $200,000. Directors—J. H. Headley, A. H. Hoadley, G. D. Deal, J. H. Peck and S. P. Jewett.

OCCIDENTAL LAND AND IMPROVEMENT CO., July 2. Capital stock, $50,000. Directors—J. P. Martin, B. W. Campion, James Newlands, A. D. Sharon and C. L. McCoy.

NEW HOME REAL ESTATE AND BUILDING ASS'N, July 2. Capital stock, $600,000. Directors—J. H. Dondlat, C. H. Rogers, J. J. Hogan, Eugene Fisk and J. Miron.

A LARGE deposit of asbestos has been found near the line of the Cuyamaca railroad in San Diego county.

DELINQUENT SALE NOTICE

Gray Eagle Mining Company—Location of principal place of business, San Francisco, California. Location of works, Placer county, Cal.

NOTICE.—There are delinquent upon the following described Stock, on account of Assessment (No. 13), levied on the 15th day of May, 1889, the several amounts set opposite the names of the respective Shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amt.
Bogart, O H, Trustee	447	5,000	$250 00
" "	467	100	5 00
Chase, Q A	419	3,814	190 70
Carnes, W A	252	416	20 80
Durning, T G, Trustee	195	100	5 00
Duncan, John	167	300	15 00
" "	247	12	60
Erlenweiss, John	63	200	10 00
" "	69	200	10 00
Francie, H L	444	1,500	75 00
Hall, Wm E	131	900	45 00
" "	154	1,000	50 00
Hall, Wm E, Trustee	411	200	10 00
" "	412	200	10 00
" "	4 3	100	5 00
Stout, C S, Trustee	422	106	5 30
Waller, L P F, Trustee	367	3,000	150 00
Wetzel, Thos, Trustee	60	250	12 50
" "	169	100	5 00
" "	288	10	50
" "	335	100	5 00
Winter, T P, Trustee	396	500	25 00
" "	397	500	25 00

And in accordance with law, and an order of the Board of Directors, made on the 25th day of June, 1889, so many shares of each parcel of such Stock as may be necessary will be sold at public auction, at the office of the Company, 327 Pine street, room 9, San Francisco, California, on Tuesday, the 23d day of July, 1889, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale. O. H. BOGART, Secretary.

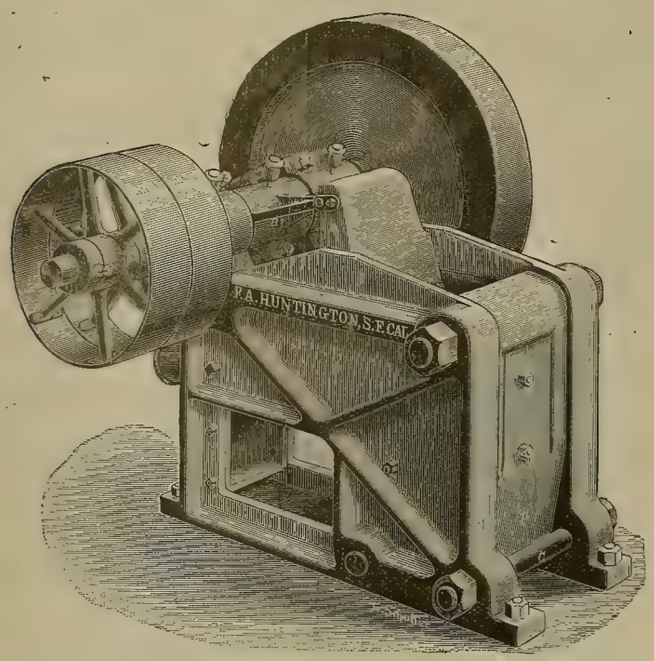
Office, 327 Pine street, room 9, San Francisco, Cal.

F. A. HUNTINGTON,

MANUFACTURER AND DEALER IN

STEAM ENGINES AND MINING MACHINERY OF EVERY DESCRIPTION.

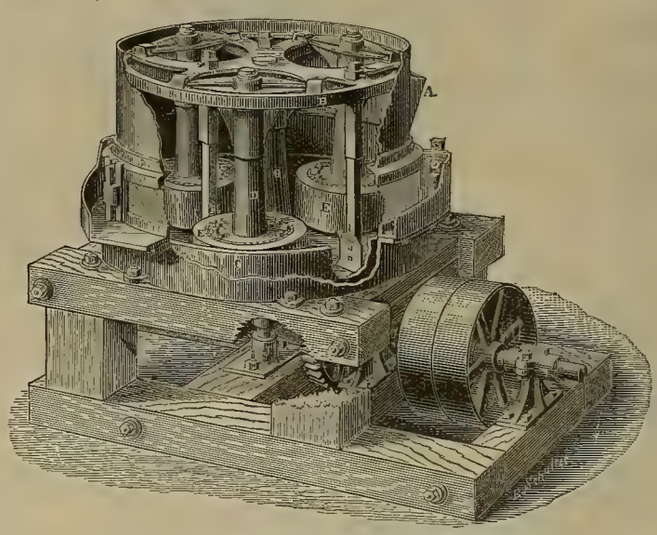
PRINCIPAL OFFICE, 45 FREMONT STREET, SAN FRANCISCO.



Huntington's Improved Rock-Breaker.

The main features of this machine are strength, ease of adjustment and simplicity of construction.

The movable jaw *A* is worked by the eccentric *B* and is pivoted at the bottom. The stationary jaw *D* is secured at the top by a bolt running through it, and at the bottom bears against the heavy bolt *C*. The main wear is, of course, at the bottom of a breaker of this form, and the wear is easily taken up by inserting a plate between the bolt *C* and the jaw *D*. The jaw is thus swung in at the bottom, and the opening where the ore passes through is made correspondingly smaller. As will be seen by the cut, this machine is of very simple construction and is strong and durable.



F. A. HUNTINGTON'S
Centrifugal Roller Quartz Mill.

The following will explain the above cut:

The ore and water being fed into the mill at the hopper *A*, the rotating rollers and scrapers throw the ore against the ring die, where it is crushed to any desired fineness by the centrifugal force of the rollers as they roll over it.

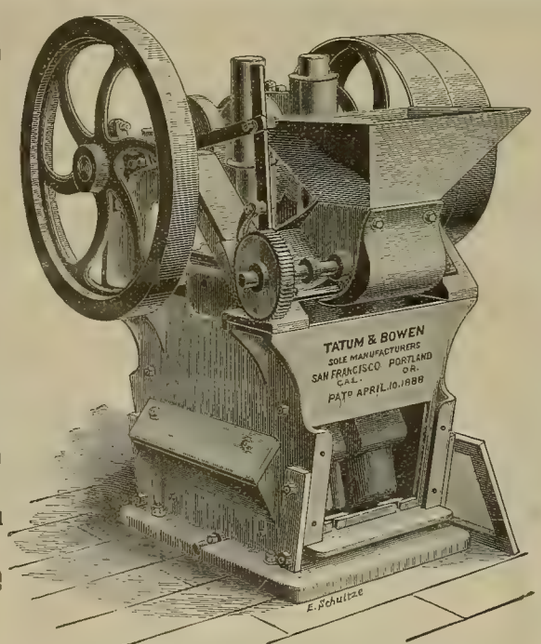
The water and pulverized ore are thrown against and through the screens when fine enough. The discharge is so perfect that it makes little or no slimes, and leaves the pulp in good condition for concentration. The rollers are suspended, leaving a space of one inch between them and the bottom of the mill, thus allowing them to pass freely over the quicksilver and amalgam without grinding it or throwing it from the mill, while it agitates it sufficiently to make amalgamation perfect. For wet crushing and gold saving it has no equal.

I claim especial merit in that feature of this system *which prevents* ALL FLOURING of gold and quicksilver, and the consequent loss of gold that attends stamp milling.

For the economical working of ore that contains sulphurets, I particularly claim the adaption of this mill. The rotary method of crushing the ore so granulates the pulp (which is discharged the moment it is crushed) that a complete concentration of sulphurets is rendered most easy.

—THE—

PERFECTED DOUBLE Economic Quartz Mill.



Attached to each Mill is an effective

Automatic Ore Feeder.

THE CRUSHING is done by the rapid rocking movement in OPPOSITE DIRECTIONS of two heavy castings, the bottoms of which are slightly circular in form, and each provided with four shoes.

The Mill is a closer Gold-Saver and catches a larger percentage of the Clean-up in the Battery than any other Mill.

It costs less, in proportion to what it will do, than any other mill. There are no working parts to buy for it, no matter how long it is used, except shoes and dies. Capacity of Mill, 6 to 10 tons per day. Weight of Mill, complete, 6400 pounds.

We manufacture, to go with the Mill, an

IMPROVED ROCK BREAKER.

Power required for Mill and Rock Breaker, 6 H. P. SEND FOR CIRCULAR. Address:

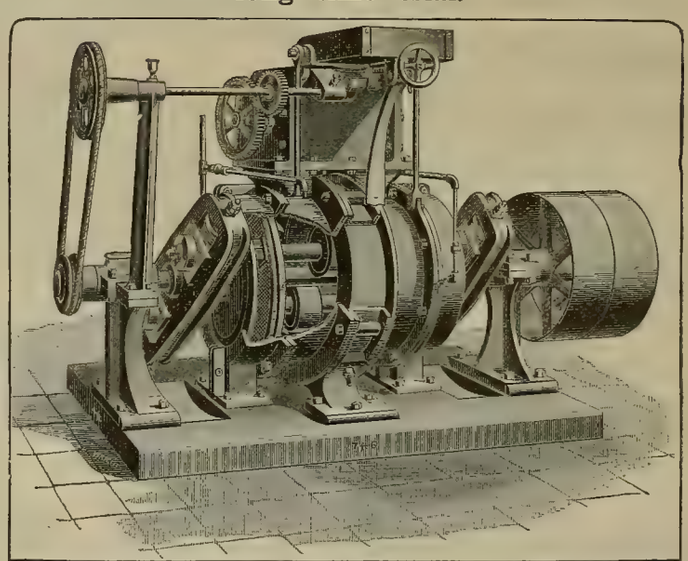
TATUM & BOWEN,

34 and 36 FREMONT ST., SAN FRANCISCO, CAL.,
AND PORTLAND, OREGON.

MANUFACTURERS OF MINING AND SAW MILL MACHINERY.

FRISBEE WET MILL.

This Mill, with a weight of less than 9000 pounds, has a capacity of three tons per hour of hard quartz to 40 mesh; has been thoroughly tested; we guarantee its work as represented, and we will give long time trial.



IT HAS NO MORE WEARING PARTS THAN CORNISH ROLLS,

And renewals will not cost over one-half as much as for stamps. Will run empty, or with small amount of ore without injury. The attention of parties having Cement Gravel is called to this Mill, as it will run 100 tons per day to No. 8 mesh; 30 to 35 H. P.

OUR DRY MILLS are the most economical ever built, and are extensively used with record of several years. No grinding in pans. Mill finishes to any fineness desired.

FRISBEE-LUCOP MILL COMPANY.

GIDEON FRISBEE, Manager, - - 59 & 61 First Street, San Francisco
HOOKER & LAWRENCE, Gen'l Ag'ts, 145 Broadway, New York.

AMALGAMATING MACHINERY.

Stamp Mills for Wet or Dry Crushing. Huntington Centrifugal Quartz Mill. Drying Cylinders. Amalgamating Pans, Settlers, Agitators and Concentrators. Retorts, Bullion and Ingot Moulds, Conveyors, Elevators, Bruckners and Howell's Improved White's Roasting Furnaces, Etc.

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CONCENTRATING MACHINERY.

Blake, Dodge and Comet Crushers, Cornish Crushing and Finishing Rolls, Hartz Plunger and Collom Jigs. Frue Vanner & Embrey Concentrators, Evans', Calumet, Collom's and Rittenger's Slime Tables. Trommels, Wire Cloth and Punched Plates. Ore Sample Grinders and Heberle Mills.

IMPROVED CORLISS AND SLIDE VALVE STEAM ENGINES. ❋ BOILERS HORIZONTAL, VERTICAL ... AND SECTIONAL....

IMPROVED STEAM STAMPS

Hoisting Engines, Safety Cages, Safety Hooks,

ORE CARS, WATER & ORE BUCKETS,

Air Compressors, Rock Drills, Etc.

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Sectional Machinery FOR MULE-BACK TRANSPORTATION.



Pumping Engines and Cornish Pumping Machinery,

IMPROVED WATER JACKET

Blast Furnaces for Galena & Copper Ores,

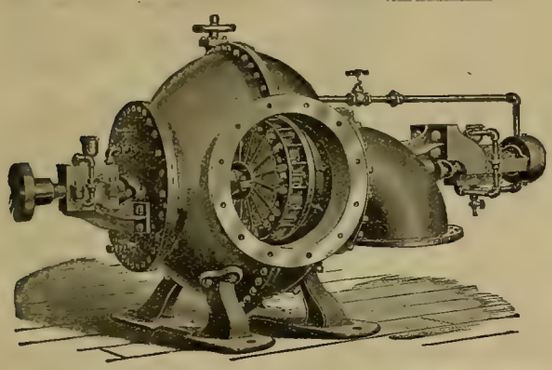
SLAG CARS AND POTS,

Roots & Baker Pressure Blowers,

SUSPENDED TRAMWAYS.

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BRANCH OFFICES: NEW YORK, Room 43, No. 2 Wall St. DENVER, COLO., 1316 Eighteenth St. SALT LAKE CITY, UTAH, 7 W. Second South St. LONDON, ENG., 23 Bucklersbury, E. C. CHIHUAHUA CITY, MEXICO, No. 11 Calle de Juarez. LIMA, PERU, South America. JOHANNESBURG, TRANSVAAL, South Africa.



JAMES LEFFEL'S Mining Turbine Water Wheel.

These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

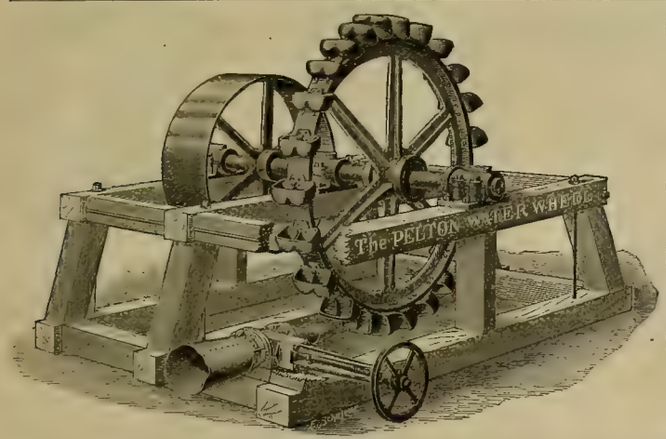
Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

JAMES LEFFEL & CO.,
Springfield, Ohio, or 110 Liberty St., New York.

FRASER & CHALMERS, General Agents, Chicago, Ill., and Denver, Col.

PARKE & LACY, General Agents, San Francisco, Cal.



THE PELTON WATER WHEEL

GIVES THE

Highest Efficiency of any Wheel in the World.

A MARVEL OF ENERGY AND POWER.

Over 600 in use on the Pacific Coast alone, aggregating upwards of 50,000 Horse Power.

It is not only most economical of water, but the most simple and reliable power for Quartz Mills, Compressors, Hoisting, Pumping, or any other purpose where water power can be used.

ELECTRIC TRANSMISSION.

Power from these Wheels can be transmitted long distances with small loss, and it is now being extensively used in this way in all parts of the country for producing both light and power.

☞ SEND FOR CIRCULAR. Address:

THE PELTON WATER WHEEL CO.,
120 First Street, - - San Francisco, Cal.

CALIFORNIA IRON YARD.

HENRY J. ROGERS & CO.

Successors to CHAS. CALLAHAN

IMPORTERS AND DEALERS IN

CAST and WROUGHT IRON SCRAP

SECOND-HAND BOILERS AND OLD MACHINERY

Of every description.

The Highest Price paid for all kinds of Metals.

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FRANCIS SMITH & CO.

Manufacturers of

Sheet Iron and Steel Pipe

ALL SIZES.

130 Beale Street, San Francisco, Cal.

Iron cut, punched and formed, for making pipe on ground All kinds of Tools supplied for making Pipe. Estimates given. Are prepared for coating all sizes of Pipe with a composition of Coal Tar and Asphaltum.

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F. H. HAUSMAN,

Gold Mining Properties Bought, Sold and Developed.

Propositions from principals only entertained.

SAFE DEPOSIT BUILDING, ROOM No. 2

THE RUSSELL PROCESS COMP'Y.

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THOMAS PRICE & SON,

Assay Office, Chemical Laboratory,

BULLION ROOMS and ORE FLOORS,

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COIN RETURNS ON ALL BULLION DEPOSITS IN 24 HOURS.
WORKING TESTS OF ORES BY ALL PROCESSES.
SPECIAL ATTENTION PAID TO CONCENTRATION OF ORES.

Ores Received on Consignment, Sampled, Assayed, and Disposed of in the Open Market to the Highest Bidder.

Metallurgy and Ores.

SELBY SMELTING and LEAD CO.,

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GOLD AND SILVER REFINERY And Assay Office.

Highest Prices Paid for Gold, Silver and Lead Ores and Sulphurets.

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BLUESTONE,
LEAD PIPE,
SHEET LEAD,
SHOT, Etc., Etc.

ALSO MANUFACTURERS OF

Standard Shot-Gun Cartridges,

Under Chamberlin Patent.

JOHN TAYLOR & CO.,

IMPORTERS AND DEALERS IN

ASSAYERS' MATERIALS, MINE AND MILL SUPPLIES,

ALSO CHEMICALS, AND PHYSICAL, SCHOOL AND CHEMICAL APPARATUS.

63 & 65 First St., cor. Mission, San Francisco.

We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price. Our New Illustrated Catalogue, with prices, will be sent on application.

☞ Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England. Also for E. G. DENNISTON'S Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices.

JOHN TAYLOR & CO.

Nevada Metallurgical Works.

NO. 23 STEVENSON STREET,
Near First and Market Streets, S. F.

C. A. LUCKHARDT, Manager. ESTABLISHED 1869

Ores worked by any Process.
Ores Sampled.
Assaying in all its Branches.
Analyses of Ores, Minerals, Waters, etc.
Working Tests (practical) Made.
Plans and Specifications furnished for the most suitable Process for Working Ores.
Special attention paid to Examinations of Mines; Plans and Reports furnished.

C. A. LUCKHARDT & CO.,
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Mining Engineers and Metallurgists.

J. KUSTEL. G. KUSTEL.

METALLURGICAL WORKS.

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Ores Sampled and Assayed, and Tests made by my Process.
Assaying and Analysis of Ores, Minerals and Waters.
Mines Examined and Reported on.
Practical Instruction given in Treating Ores by improved processes.

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GREAT REDUCTION!

BATTERY SCREENS.

Best and Cheapest in America.

No imitation, no deception, no planished or rotten iron used. Only genuine Russia iron in Quartz Screens. Planished iron screens at nearly half my former rates.

I have a large supply of Battery Screens on hand suitable for the Huntington and all Stamp Mills, which I will sell at 20 per cent discount.



PERFORATED SHEET METAL

For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass, Zinc and other metals punched for all uses.

Inventor and Manufacturer of the celebrated Slot Cut burred and Slot Punched Screens.

Mining Screens a specialty, from No. 1 to 15 (fine).

Orders promptly attended to.

San Francisco Pioneer Screen Works,
21 & 223 First St., San Francisco, Cal.
JOHN W. QUICK, Proprietor.

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, July 3, 1889.

General trade still wears the mid-summer holiday character, and no material increase in the volume of goods to go out on orders is looked for until after the present month is passed. All advices concur in stating that interior merchants are carrying smaller lines of goods than even at this time in 1888, while a decided increase in the demand is looked for.

The local money market has an easy tone. Heavy disbursements are being made to meet semi-annual interests and the regular dividends. It is generally conceded that the moneys disbursed in this way soon find their way back into the general reservoirs. Remittances from the interior are very light. There is an increasing call for money for crop purposes, with several large sums reported to be engaged for use as required. It is generally conceded that in various mining districts in this State and territory contributory to us that there will be less activity than there was even in 1888, owing to the light supply of water; but in many of the districts where there are mills run by steam there will be more doing.

In the speculation markets, trading was to some extent interfered with by many active operators being out of the city. Those left appeared to have been inspired by a desire not only to do more business but advance prices. Mining-stock and cereal futures have been quite active wite attractive fluctuations.

The last steamer leaving for China took out for Hongkong the following treasure: Mexican dollars, $351,605; gold coin, $9922; silver bullion, $170,600; gold dust, $935. Total, $533,062.

The bank clearances for June compare as follows: In 1888, $66,093,189; in 1889, $67,897,824. Increase this year, $1,804,635.

The internal revenue collections from January 1, 1889, to July aggregate $926,598, against $1,046,594 for the like time in 1888.

For the first six months of the year the custom duties collected compare as follows: in 1889, $4,508,-301; 1888, $4,805,627; 1887, $3,470,418.

The coinage of the United States mint in this city for the fiscal year ending with June 30, 1889, was as follows:

Descriptions—	Amount.
Double Eagles	$17,447,000
Eagles	5,907,000
Half Eagles	4,500
Standard Dollars	108,000
Quarter Dollars	112,000
Dimes	155,455
Total	$23,733,955

The total for 1887-88 was $25,701,284, against $23,215,812 in 1886-87.

The shipments of gold to Europe from New York are attracting attention. The New York *Journal of Commerce* says that since April they aggregate about $30,000,000. One of the largest shippers of gold said: "Our gold is going to Paris and it is a legitimate exchange transaction. The Bank of France is calling for gold. It has not been receiving gold before for a long time. The Exposition has something to do with it. The balance of trade is in favor of France and against America, and Americans are spending immense sums in Paris this year." The regular weekly statements of the New York banks just to hand do not show that the drain has been felt in the least possible degree, so wonderful is our mineral resources.

The receipts of treasure by sea the past week were light, being $3785 in coin, with a silver bullion shipment from Mexico, value not obtainable.

SILVER — The London market held steady throughout the week, but the New York market fluctuated at lower prices. In our market prices, so far as obtainable, range from 92½ to 92⅝c according to the wants of the buyer. The last steamer for China took out very little silver bullion, and yet the supply on the market is very light. The day the steamer left 92.55 cents was bid for a parcel. If bought it would have to be held until the next steamer leaves. The production of the mines on this coast is not much more than 75 per cent what they were last year at this time.

London cables came through to-day at 42 1-16d. In our market we are not able to get any sales, quotable at 92½@92¾c.

MEXICAN DOLLARS—The market has held very strong, with 75c paid for new. The last steamer for China took out larger shipments than at any one time this year.

QUICKSILVER—Receipts the past week aggregate 91 flasks, and the shipments by sea 15 flasks to Auckland. For the month of June the receipts were 1573 flasks, and exports by sea, 431. For the first six months of the year the receipts and exports by sea compare as follows:

	Receipts.	Exports.
1889	8,205	5,793
1888	14,076	7,226
1887	11,583	5,197

The local market holds fairly strong at quotations, with a good demand for the season.

BORAX—Receipts the past week aggregate 56 ctls. The receipts for June aggregate 159,900 lbs., exports 747,304. The receipts and exports for the first six months of the year aggregate as follows:

	Receipts.	Exports.
1889	2,405,600	*3,389,132
1888	4,399,800	2,703 779
1887	3,308,800	4,817,132

Exports by rail not received.

The market holds very strong, with a good consumptive call from the East.

LIMES—Receipts the past week aggregate 3497 barrels. The market continues fairly active, with a good consumptive or shipping demand from Hawaii report. Prices are steady,

TIN—No imports the past week. There was shipped by sea to Victoria, B. C., 54,000 lbs. of plate. The market for both pig and plate is easier, for both spot and shipment. The consumption on this coast by fruit canners, it is claimed, will not equal that of 1888, while the consumption by salmon packers and others is always an uncertain element. The market abroad is reported to favor buyers at a slightly lower range in values.

LEAD—With us the market is reported strong with an advancing tendency. The feeling appears to be that the decision of the Treasury will be against Mexican ores, even if it is not the Mexican Government will probably take steps to put an export duty on the ore so as to keep the working of it in their country. It looks as if the upward movement at the East in lead is brought about by the Lead Trust Company so as to float, more successfully, their lead trust certificates at good profits, the same as was done by the Rothschilds in the late copper deal in Europe of all securities based on the price of copper.

COPPER—The statistical position of copper abroad appears to be steadily shaping in the interest of holders. The stocks, although reduced, are yet several times higher than they were from two to three years ago. At the lower prices consumers are using more.

IRON—The market continues unchanged. Consumers are gradually using up their surplus. The large stock here (about 2000 tons) held by first hands, is an increase to the market, and until it is worked to lower figures, no improvement in values is looked for.

COKE—The spot market is well cleaned up. The high prices is quite an inducement to foundrymen to sell part of their spot surplus. For shipment, values are unchanged.

COAL—Imports the past week were as follows: From Australia, 11,111 tons; Departure bay, 5100; Nanaimo, 1224; Irondale, 320. Total, 17,755 tons. The market shows a strong tone for both foreign and domestic. Importers of Australian for early loading are quite bullish. Several cargoes have been placed the past week for this month's shipment at from $6.75 to a fraction advance. For September-October loading, the market is quotable at about $6.50. Importers claim that with an advance in wheat charters, several American vessels engaged in the coast coal trade will withdraw and accept wheat charters, which, if the case, will cause higher freights for coast coal. Large consumers of coal are not disposed to anticipate their forward wants to any great extent after July-August loading, believing that later loading will come on an unfavorable market, and that holders will be forced to sell for less money. Wheat charters are advancing, which will attract more coal-laden vessels.

Eastern Metal Markets.

By Telegraph.

NEW YORK, July 2, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	42	91¾	$12 00	$4 05	$19 90
Friday	42	91¾	12 00	4 05	19 85
Saturday	42	91¾	12 00	4 05	19 90
Monday	42	91¾	12 00	4 05	19 85
Tuesday	42	91¾	11 75	4 05	19 65
Wednesday	—	—	—	—	—

NEW YORK, July 2.—The copper market is in better form, including an enlarged home consumption. Baltimore copper, 10½c, extreme; Lake, nominally, 12c. Pig lead maintains its strength at $4.02½@$4.05 bid for August, the latter being obtained for 50 tons; $4.10 for September and $4.12½ for November and December; 200 tons spot, mostly at $4@4.02½. Refined borax is scarce and higher. Parcels on the way have been absorbed. Quicksilver, 65@66c, supported by London rates.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, July 3, 1889.

ANTIMONY—	13 @	14
BORAX—Refined	7½@	7¾
Powdered	7½@	7¾
Concentrated	— @	6¾
COPPER—		
Bolt	26 @	27
Sheathing	26 @	—
Ingot, jobbing	15 @	16
do, wholesale	12 @	13
Fire Box Sheets	— @	26
LEAD—Pig	4½@	—
Bar	5 @	—
Sheet	8 @	—
Pipe	7 @	—
Shot, discount 10% on 500 bags Drop, ℔ bag.	1 45 @	—
Buck, ℔ bag	1 65 @	—
Chilled, do	1 85 @	—
STEEL—English, lb	16 @	20
Canton tool	9½@	—
Black Diamond tool	10 @	16
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4¼@	—
TINPLATE—B. V., steel grade, 14x20, P. S	4 60 @	4 65
B. V., steel grade, 14x20, spot	4 85 @	4 90
Charcoal, 14x20	6 25 @	6 75
do roofing, 14x20	5 12½@	5 75
Pig tin, spot, ℔ lb	21¾@	21¾
do, do, prompt shipment	— @	—
QUICKSILVER—By the flask	45 00 @47	50
Flasks, new	@	—
Flasks, old	35 @	—
COKE—Eng., ton, spot, in blk & sks, respectiv	20 00 @	—
Do, do, to load	13 00 @13	25

IRON—	Spot.	To Load.
Glengarnock ton	27 00 @— —	27½@ —
Eglinton, ton	26 00 @— —	26½@ —
American Soft, No, 1, ton	— — @31 00	31½@ —
Oregon Pig, ton	— — @30 00	— @ —
Clay Lane White	— — @24 50	25 @ —
Shotts, No. 1	28 50 @29 00	— @ —
Bar Iron (base price) ℔ lb	2¾@ 3	— @ —
Chrome iron ore, ℔ ton	— — @10 00	— @ —

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	$ 6 75 @ 7 00	Cardiff	9 50@10 00
Liverpool St'm	7 25 @ 7 50	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	8 00 @ 8 50	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Gilman	6 00
Scotch Splint	8 00	Seattle	6 00
West Hartley	9 50	Coos Bay	5 00
Greta	8 00	Cannel	10 00
Westminster Brymbo	8 00	Egg, hard	17 50
Nanaimo	9 00	Cumberland, in sacks	19 00
Sydney	$ 8 00	do, bulk	18 00

THE San Diego *Union* is authority for the statement that large schools of the true sardine exist off the coast in the vicinity of its city, and that capitalists are investigating the matter with a view to establish a sardine packing establishment there.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVER THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Andes M Co	Nevada	35	25	Jun 12	July 18	Aug 8	J J Hawkins	309 Montgomery St
Bella Union Quicksilver M Co	Cal	7	20	May 21	June 24	July 15	A Halsey	328 Montgomery St
Best & Belcher M Co	Nevada	43	25	June 6	July 11	Aug 1	L Osborn	309 Montgomery St
Crocker M Co	Arizona	7	10	Jun 14	July 19	Aug 13	A Waterman	309 Montgomery St
Equitable Tunnel & M Co	Utah	34	5	May 14	June 20	July 15	C J Collins	1018 Market St
Eureka Con M Co	Nevada	12	50	Jun 12	July 15	Aug 7	H P Bush	306 Pine St
Fine Con M Co	California	6	14	June 11	July 18	Aug 10	J C Bates	434 California St
Gray Eagle M Co	California	13	05	May 15	July 2	July 23	O H Bogart	327 Pine St
Golden Fleece Gr'l M Co	California	14..17	00	May 21	July 20	Sept 16	W J Gleason	306 Market St
Inyo Marble Co	California	6	5	May 14	June 24	July 24	G W Luce	205 Front St
Morgan M Co	California	13	15	May 9	Jun 17	July 8	C S Neal	230 Montgomery St
North Belle Isle M Co	Nevada	15	30	June 17	Aug 1	Aug 22	J W Pew	310 Pine St
Nevada Queen M Co	Nevada	5	50	June 3	July 9	July 30	H Deas	309 Montgomery St
Original Gold Hill M Co	Nevada	12	25	June 17	July 23	Aug 14	A W Barrows	303 California St
Pinal Con M Co	Arizona	8	13	May 15	Jun 21	July 12	A Cheminant	328 Montgomery St
Platt & Gilson G M Co	California	1	3 00	June 20	July 22	Aug 7	C Herrman	326 Kearny St
Quar z Mountain M Co	California	21	40	Jun 17	July 22	Aug 15	E Hestres	217 Sansome St
Seg Belcher & Mides Con M Co	Nev	3	25	June 4	July 8	July 29	E B Holmes	309 Montgomery St
Sierra Nevada M Co	Nevada	95	25	June 7	July 11	July 31	E L Parker	309 Montgomery St
Teirak off M Co	California	2	10	May 18	Jun 18	Jul 18	W J Gurnett	302 Pine St
Union Con M Co	Nevada	38	25	May 13	Jun 19	July 10	J M Buffington	303 California St
Weldon M Co	Arizona	13	10	May 13	Jun 18	July 9	A Waterman	309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING	DATE
Best & Belcher M Co	Nevada	L Osborn	309 Montgomery St	Annual	July 8
Live Oak Drift Gravel M Co	California	J Morizio	328 Montgomery St	Annual	Aug 20
May-Flower Gravel M Co	California	J Morizio	328 Montgomery St	Special	July 11
Overman M Co	Nevada	O D Edwards	414 California St	Annual	July 11
Union Con M Co	Nevada	J M Buffington	303 California St	Annual	July 15

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Benton Con M Co	California	J B Haile	330 Pine St	Annual	July 31
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	May 10
Caledonia M C	Nevada	A S Cheminant	328 Montgomery St	08	Apr 26
North Star M Co	California	D A Jennings	401 California St	50	Dec 31
Navajo M Co	California	J W Pew	310 Pine St	10	Apr 1
Idaho M Co	California		Grass Valley	7.50	Mar 5
Pacific Borax, Salt & Soda Co	California	A H Clough	230 Montgomery St	1.00	Mar 11

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$19 00	$16 00
41 to 50 ft	20 00	17 00
51 to 60 ft	22 00	19 00
61 to 70 ft	26 00	22 00
1x3, fencing	21 00	18 00
1x4, "	20 00	17 00
1x3, 1x4 and 1x6, odd lengths	18 00	15 00
Second quality	16 00	14 00
Selected	23 00	21 00
Clear, except for flooring	30 00	27 00
Clear for flooring	1 00	.....
Clear V. G. No. 1 flooring	5 00	.....
Firewood	13 00	9 00
Dressed Pine, flooorring, No. 1, 1x6	31 00	28 00
No. 1, 1x4	33 00	29 00
No. 1, 1¼x4, 1¼x6, and odd sizes	36 00	32 00
All sizes, No. 2	26 00	23 00
Stepping, No. 1	43 00	34 00
Stepping, No. 2	33 00	24 00
Ship timber and plank, rough	26 00	17 00
Selected, planed 1 side, average 40 ft	28 00	23 00
" " 2 " "	25 00	30 00
" " 3 " "	32 00	27 00
" " 4 " "	34 00	29 00
Deck plank, rough, average 35 ft	34 00	31 00
Dressed, average 35 feet	39 00	34 50
Pickets, rough, B. M	19 00	15 00
½x1¼, 4 ft long, ℔ M	5 50	4 00

The Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

	Cash.	Debt.
Alta	$32 929	$.....
Alpha	3,667	.....
Andes	3,454	.....
Bodie Con	47,174	.....
Benton Con	94,328	.....
Belcher		4,367
Belle Isle	.....	.....
Best & Belcher		10,535
Bulwer	13,515	.....
Bullion	14,786	.....
Challenge Con		11,349
Caledonia	10,115	.....
Chollar		30,586
Con. Cal. & Virginia	*37,062	.....
Confidence	16,237	.....
Con. Imperial	8,471	.....
Con. New York		11,240
Commonwealth		61,884
Crocker		1,131
Crown Point		38,816
Del Monte		9,613
Diana	4,041	.....
Exchequer	19,441	.....
Gould & Curry	21,170	.....
Grand Prize		30,394
Hale & Norcross	†52,021	.....
Holmes		4,545
Independence	1,509	.....
Kentuck	1,709	.....
Lady Washington	22,615	.....
Locomotive	4,249	.....
North Belle Isle		29,233
North Commonwealth		7,493
Mexican	4,584	.....
Mono	17,468	.....
Navajo	14,500	.....
Occidental	25,641	.....
Ophir	37,261	.....
Overman	3,413	.....
Peer		538
Peerless	13,829	.....
Potosi	864	.....
Savage		41,031
Seg. Belcher & Mides	.....	24,508
Silver Hill	39,373	.....
Sierra Nevada		1,623
Silver King	47,564	.....
Standard	7,871	.....
Union Con	16,560	.....
Utah	2,505	.....
Weldon	.....	6,413

*Later reports give about $194,000, with the June clean-up to hear from.

†With full bullion report not received.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, term of subscription, and give it their own patronage, and as far as practicable aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING June 12		WEEK ENDING June 19.		WEEK ENDING June 26.		WEEK ENDING July 2.	
Alpha	1 35	1 65	1 10	1 45	1 10	1 25	1 15	1 25
Alta	1 35	1 50	1 25	1 35	1 40	1 60	1 40	1 45
Andes	50	55	30	35	50	45	45	55
Argenta	.....	.....	.....	.....	.....	.....	.....	.....
Belcher	3 30	4 05	2 60	3 50	2 75	3 40	2 80	3 40
Best & Belcher	3 00	3 70	2 50	3 25	2 50	3 20	2 90	3 60
Bullion	60	75	60	70	60	70	65	70
Baltimore	.....	10	.....	.....	.....	.....	.....	.....
Belle Isle	.....	25	.....	20	.....	20	.....	20
Bodie Con	1 25	1 70	1 20	1 30	1 25	1 40	1 30	1 35
Benton	3 00	3 50	.....	3 85	4 00	4 50	.....	.....
Bodie Tunnel	.....	.....	.....	.....	.....	.....	.....	.....
Bulwer	30	40	30	.....	.....	30	30	35
Commonwealth	4 60	4 70	4 25	4 50	4 00	4 30	4 05	4 20
Con. Va. & Cal	7 00	7 8	6 8	7 8	6 7	7 8	7 8	7 8
Challenge	2 35	2 85	1 75	2 20	1 80	2 35	1 85	2 30
Chollar	1 75	2 55	1 50	2 00	1 50	1 75	1 60	1 80
Confidence	6	6 4	5	6	5 4	6	.....	6 00
Con. Imperial	35	50	35	40	35	45	40	45
Caledonia	20	25	20	35	20	.....	.....	.....
Con. Pacific	.....	.....	.....	.....	.....	.....	.....	.....
Crown Point	2 90	3 65	2 25	3 10	2 25	2 75	2 40	2 75
Crocker	40	45	.....	30	20	30	25	30
Central	.....	.....	.....	.....	.....	.....	.....	.....
Dudley	.....	.....	.....	.....	.....	.....	.....	.....
East B. & B	.....	.....	.....	.....	.....	.....	.....	.....
Eureka Con	.....	2 50	.....	.....	.....	.....	.....	.....
Exchequer	65	85	60	70	50	70	60	70
Grand Prize	80	90	70	80	70	75	85	75
Gould & Curry	2 15	2 60	1 75	2 35	1 75	2 20	2 05	2 40
Hale & Norcross	3 55	3 85	3 50	3 70	3 00	3 45	3 30	3 45
Holmes	.....	.....	.....	.....	.....	.....	.....	.....
Independence	.....	.....	.....	.....	.....	.....	.....	.....
Iowa	.....	.....	.....	.....	.....	.....	.....	.....
Julia	.....	25	.....	20	20	.....	25	30
Justice	.....	1 10	1 15	1 25	1 10	1 45	.....	1 40
Kentuck	1 20	1 60	1 05	1 15	1 05	1 30	1 15	1 20
Lady Wash	35	40	.....	35	35	.....	40	40
Locomotive	.....	.....	.....	.....	.....	.....	.....	.....
Martin White	.....	.....	.....	.....	.....	.....	.....	.....
Mono	1 05	1 35	95	1 10	1 00	1 05	1 00	1 10
Mexican	3 05	3 70	2 70	3 40	2 70	3 25	3 00	3 90
Mt. Diablo	.....	.....	.....	.....	.....	.....	.....	.....
Navajo	.....	50	.....	.....	.....	.....	.....	.....
North Belle Isle	1 05	1 10	1 00	1 10	95	1 10	80	95
Niagara	.....	.....	.....	.....	.....	.....	.....	.....
Nev. Queen	1 00	1 05	80	90	55	1 10	80	95
North G. & C	.....	.....	.....	.....	.....	.....	.....	.....
Occidental	1 45	1 60	1 25	1 40	1 35	1 50	1 40	1 60
Ophir	4 35	4 60	4 00	4 75	4 05	4 75	4 35	5
Overman	1 25	1 50	95	1 35	1 00	1 15	1 10	1 15
Potosi	1 85	2 15	1 50	1 95	1 45	1 70	1 50	1 70
Peerless	.....	50	25	40	25	45	35	40
Peer	20	25	15	20	15	25	20	25
P. Sheridan	.....	.....	.....	.....	.....	.....	.....	.....
Silver Star	.....	.....	.....	.....	.....	.....	.....	.....
Savage	2 05	2 50	1 80	2 30	1 80	2 15	1 90	2 15
S. B. & M	2 55	2 95	1 50	2 60	1 50	1 95	1 70	1 90
Sierra Nevada	2 20	2 75	1 75	2 35	1 75	2 25	2 95	2 45
Silver Hill	40	45	40	45	40	45	40	45
Silver King	.....	.....	.....	.....	.....	.....	.....	.....
Scorpion	20	25	15	20	15	20	20	25
St. Louis	.....	.....	.....	.....	.....	.....	.....	.....
Syndicate	.....	.....	.....	.....	.....	.....	.....	.....
Union Con	2 50	3 50	2 75	3 40	2 75	3 15	2 90	3 55
Utah	90	1 10	80	95	80	1 00	90	1 05
Yellow Jacket	3 15	3 80	2 70	3 15	2 70	3 15	2 85	3 25

Sales at San Francisco Stock Exchange.

TUESDAY, July 3, 9:30 A. M.

100	Alpha	1.20	
500	Baltimore	.10c	
370	Belcher	3.05	
100	B. & Belcher	2.95	
270	Bodie	1.25	
100	Bullion	.65	
100	Challenge	2.00	
100	Crown Point	2.40	
120	Con Va & Cal	7.50	
150	Eureka Con	2.00	
150	Gould & Curry	2.05	
120	Hale & Nor	2.10	
150	Justice	1.35	
100	Mexican	3.35	
150	N. Belle Is	1.20	
100	Overman	1.05	
250	Ophir	5 00	
100	Potosi	1.65	
100	Savage	1.90	
450	Sierra Nevada	2.75	
450	Union	3.25	
150	W Comstock	40c	
150	Yellow Jacket	2.90	

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Con. California and Virginia, 29, $66,414; Justice, 29, $4297; Commonwealth, 29, $16,000; Hanauer, 26, $5100; 28, $2800; 29, $2200; 30, $2900; Alice, 28, $24,320.

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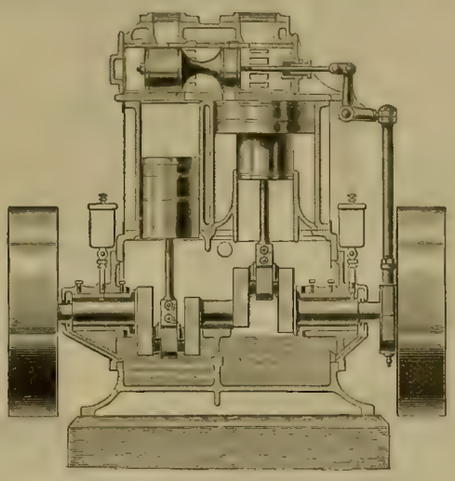
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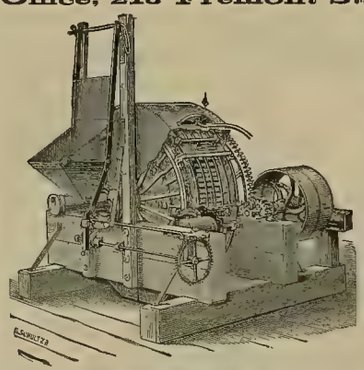
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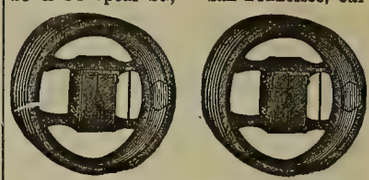

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COAL MINES OF THE WESTERN COAST.
A few copies of this work, the only one ever published treating of Pacific Coast Coal Mining, have been obtained, and are for sale at this office for $2.50 per copy. It was written by W. A. Goodyear, Mining and Civil Engineer, formerly of the California State Geological Survey.

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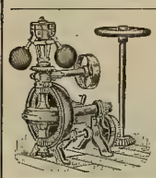

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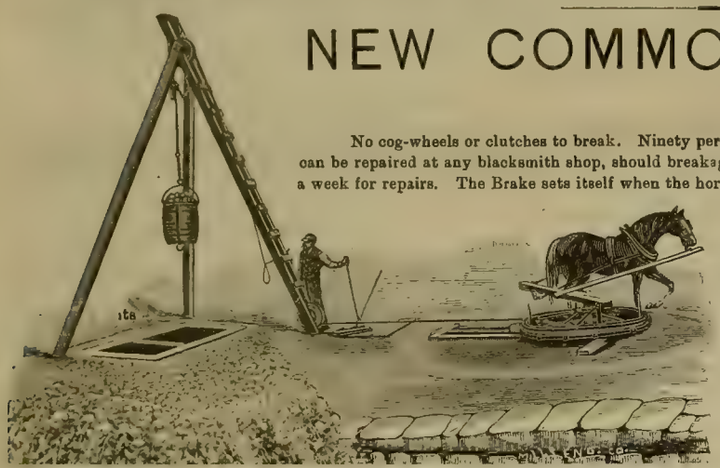
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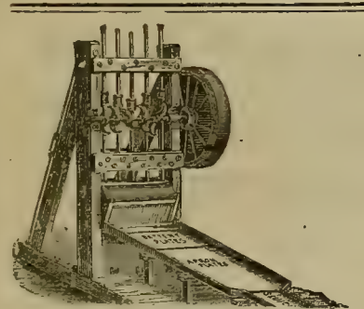
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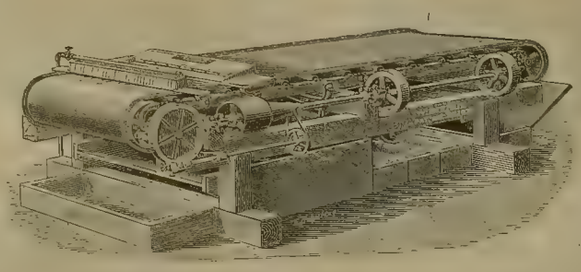
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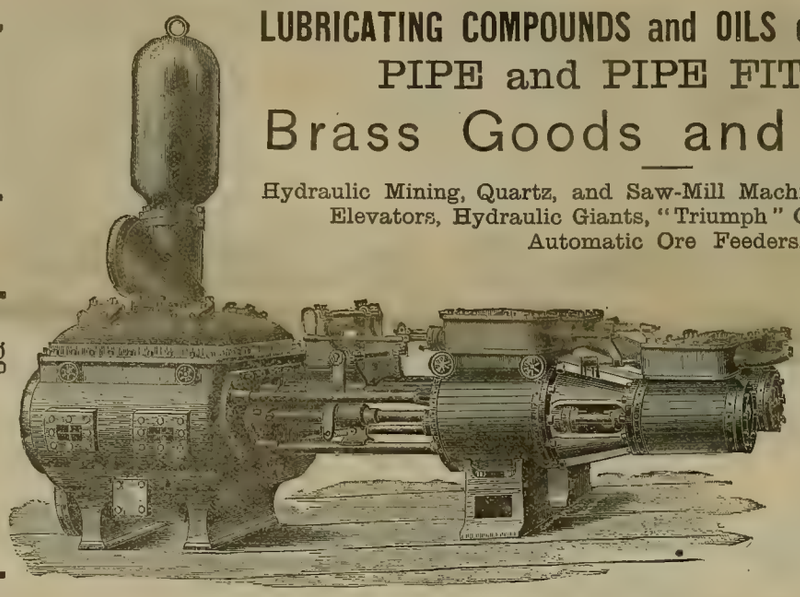
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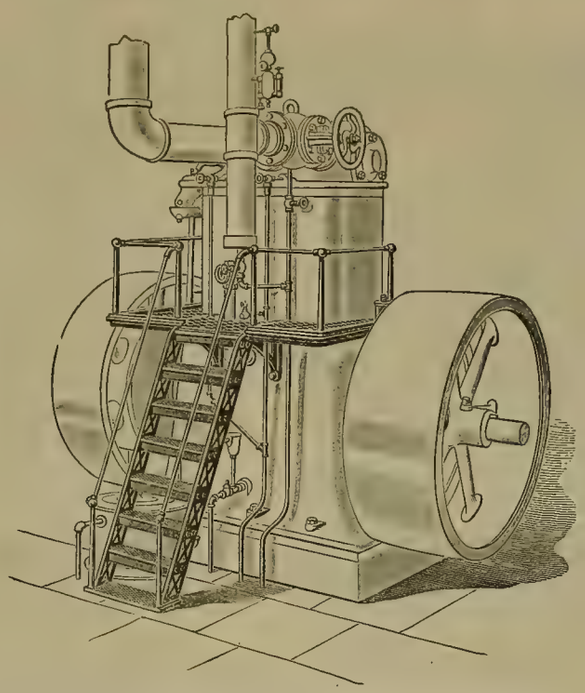
SAN FRANCISCO, SATURDAY, JULY 13, 1889.

Three Dollars per Annum
Single Copies, 10 Cts.

The Westinghouse Engine.

Engravings are given on this page of the improved Westinghouse compound engine. Several of this type are in use in this city, the Palace hotel having one of 100-horse power and the Baldwin hotel one of 85-horse power. The agents, Parke & Lacy, have lately placed a 35-horse power engine on the steamship Australia. The Haywards (Alameda county) Electric Light Co., which had been using another form of 11x16 engine to furnish twenty-two 2000-candle power arc lights and ninety 16-candle power incandescent lights, found it took 1850 pounds of Seattle nut coal for six hours' run. A 10 and 18 by 10 Westinghouse compound engine has just been substituted which does the same work on an average coal consumption of 1000 pounds, all the conditions being the same. As coal costs money in California, this saving of nearly one-half is appreciated.

At the mammoth sugar refinery of Claus Spreckels at Philadelphia there are 31 of these Westinghouse engines as part of the power plant. Fifteen of these engines, each of 60-horse power, are for driving the centrifugal driers, each engine being coupled direct to its own drier, dispensing altogether with line shafting. The investigations on the part of Mr. Spreckels, together with his architect and engineer, which led up to this arrangement, were unusually interesting and complete. An entire set of apparatus was shipped to the Westinghouse Machine Co. at Pittsburg, together with a supply of raw sugar and the necessary workmen. The plant, including the engine, was duly erected, and the processes gone through with and the sugar refined on the spot. The power required, and cost of same, was thus carefully ascertained, and the order for engines placed accordingly.



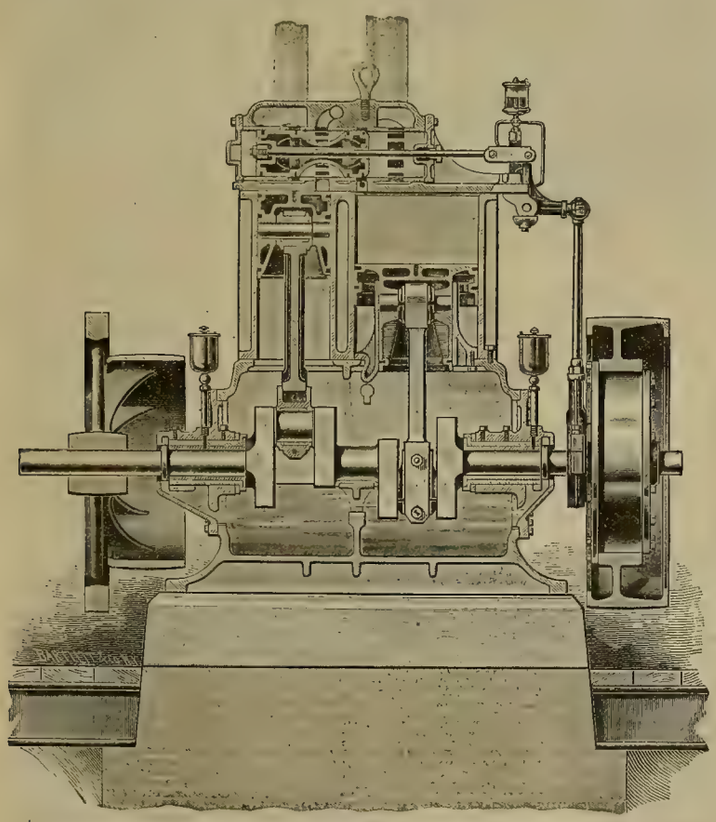
FOOTBOARD AND STEPS OF WESTINGHOUSE ENGINE.

A specific description of the Westinghouse compound engine is scarcely necessary since the public, already familiar with the Westinghouse standard and junior engines, will understand the readiness with which this type of engine lends itself to compounding. In general form the compound engine more nearly resembles the junior engine. The mechanical characteristics of the single-acting engine are retained in every particular. One cylinder is enlarged to practically 3½ times the area of the other. The valve chest is across the top of the cylinders, being the construction which admits of the least possible clearance in the l. p. cylinder. The valve chest is in one piece, the various steam passages being chambered in it. The valve seat is in the form of a bush, in which the ports are cut—not cast—to an exact register. This bushing is reamed out and forced steam-tight into its bored seat.

The valve chest also contains a small by-pass valve controlling a cored passage, by which live steam can be admitted to the l. p. cylinder, to turn the engine over its center when starting. The steam and exhaust connections are on the side of the valve chest toward the back of the engine, bringing the throttle valve into convenient position, and admitting of the ready removal of the valve chest when desired.

The valve functions on both cylinders are performed with theoretical perfection by the most simple and direct mechanism, the equivalent for which in the previous types of automatic compound engines is from four to eight valves, with one or more eccentrics and rods, and a formidable train of releasing and other valve gear.

The larger compound engines of 100-horse power and upward may require an elevated foot-board for convenient access to the throttle, by-pass, etc. A cut is given of an engine fitted with this foot-board and steps.



LONGITUDINAL SECTION OF WESTINGHOUSE COMPOUND ENGINE.

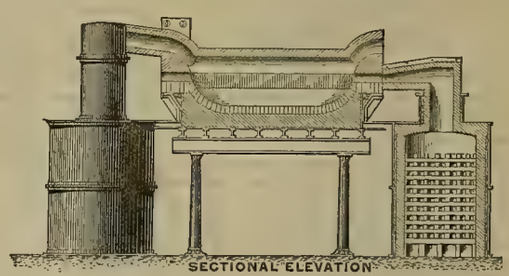
The Batho Furnace.

The Batho furnace, shown in the cuts herewith, is one of the best forms of open-hearth furnaces yet devised. It was recommended and its advantages were described by Messrs.

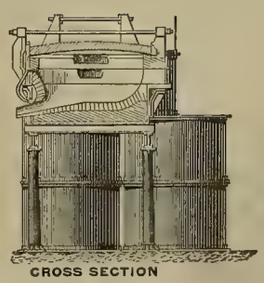
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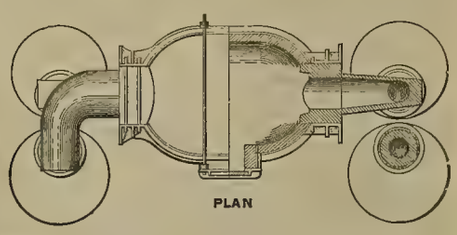
END ELEVATION



SECTIONAL ELEVATION



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THE BATHO OPEN HEARTH FURNACE.

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We admit, unindorsed, opinions of correspondents.—EDS.

Where Are There Fossils on the Gold Belt?

EDITORS PRESS: — As you are probably aware, an investigation of the Gold Belt of California by the U. S. Geological Survey is now in progress. The area embraced extends from the crest of the Sierra Nevada to the Sacramento and San Joaquin valleys, and reaches from Quincy, Plumas Co., to the neighborhood of the Yosemite valley. The topographical maps (of which half are done) are contoured and will be published on a scale of two miles to the inch, with the geology indicated as minutely as the scale will permit. Maps on larger scales will be made of particularly important localities. When completed copies of all of them will be sold, with the explanatory text by the Government at the cost of reproduction.

The geological investigation of this area, containing about 12,000 square miles, will be pushed as rapidly as is consistent with thoroughness; but, at best, it must occupy a number of years. For the sake of hastening the work I desire to make an appeal to your readers:

A large part of the area of the Gold Belt is occupied by schists, slates, quartzites and limestones, which ordinarily stand in a nearly vertical position, or are much disturbed and tilted at all sorts of angles. In these rocks fossils are known to have been found at a very few points, and these remains indicate that formations of at least three distinct ages are involved; viz., carboniferous, jura-trias and neocomian. The known fossiliferous localities however are so few, that it is impracticable by their aid alone to map the formations. To furnish satisfactory maps of the Gold Belt we must find more fossiliferous localities, and we are making every effort during the field work to discover them. But in a region so extensive and so scantily supplied with remains, it is largely a matter of chance whether one hits upon a fossil-bearing bed or passes it by.

Now it seems to me in the highest degree probable that some of your readers, miners, school-teachers and others interested in natural phenomena are aware of places where fossils are to be found, but have never called public attention to them. I desire to appeal to all such for aid. In return for authentic information, they will receive public acknowledgment in the reports of the Survey, and I shall be able to extend to them some limited facilities for acquiring advance sheets of maps, but I can offer no money.

Fossils in the beds in question will in all probability be only shells, or rather the impressions of shells with little or no material recognizable by itself as shells.

I request that information be addressed to me, and ask that the descriptions of localities may be as minute as possible, so that a collector may lose no time in finding the exact spot.

Definite and characteristic fossils have so far been found at the following localities: The ridge to the west of Gennessee valley in Plumas county, and to the east of Taylorville; Parrish's ranch, northeast of Pence's ranch, in Butte county; in Sailor canyon, southeast of Cisco; in a railroad cut one mile west of Colfax; in Big canyon, north of Placerville; near Robert's ferry, on the Stanislaus river; the Mariposa estate north of Bear valley.

Imperfect or uncharacteristic fossils have also been found in the limestone at Cave City, Calaveras county, near Colfax, and elsewhere.

Yours truly, GEO. F. BECKER,
U. S. Geologist in charge.

Address: San Francisco.

Prescott, Arizona.

EDITORS PRESS:—Most every new-comer to Prescott expresses himself agreeably surprised in finding our town one of the most delightful and pleasant mountain cities on the Pacific Slope. Surrounded on all sides by pine-clad hills, with Thumb butte and Granite mountain as stern sentinels holding watch over the beautiful panorama beneath them, our little community of about 2000 inhabitants does certainly appear inviting to those who wish to dwell among the mountains, in an altitude of over 5200 feet above the level of the sea, and in an unsurpassed-all-the-year-round climate. The summer heat is never oppressive, because of the air being so light, pure and dry, and the short winter seasons scarcely enable us to harvest a crop of natural ice of three to four inches in thickness.

Prescott, the county seat of Yavapai county, is the present southern terminus of the Prescott & Arizona Central Railroad, which at Prescott Junction connects with the Atlantic & Pacific line of railroad. In the business portion of the town we notice several substantial brick and stone buildings, while the majority of dwelling-houses are handsome and neat cottages, surrounded by shade trees and lawns. The city has water works, electric light, an excellent fire department, consisting of one hook and ladder company and three hose companies, and a large and roomy city hall, and in the center of the plaza stands the county courthouse, an elegant and noble-looking building.

The country surrounding Prescott on three sides to the east, south and west is one vast mineral range, where gold, silver, copper and lead are found in countless veins and deposits. There are upward of 12,000 locations entered on the records of the county, and reports of new discoveries are daily coming in. Until recently but little attention was paid to any ore that did not contain over $100 worth of the precious metals; but things are gradually changing for the better, and already several mills with concentration machinery are being put up in the different districts for the purpose of reducing the bulk of the millions of tons of low-grade ores. The erection at Prescott of general reduction works, which will treat all the rich ores from the different districts, and also the concentrates coming from these mills, is only a matter of time as a natural consequence of progress in developing the mineral resources of this section of Arizona.

The prospects of getting the railroad extended to Phœnix and the great agricultural valley of the Salt river are very good, and altogether the future looks very bright and promising for Prescott. JULES BAUMANN.

West Side Coal Mines.

Cheap fuel has been and still is a great desideratum in connection with manufacturers' interests in California, and especially in the interior valleys, which are practically treeless. The discovery of coal on the West Side is a matter of importance to Fresno, and in fact to the entire San Joaquin valley. Wellington coal is now $14 per ton in Fresno. All foreign coals must come by way of San Francisco, and the cost of unloading from ships, transferring loading on cars and carrying it inland is very great. Coal that is mined in the great interior valley, therefore, can be placed in the market cheaply. Fresno coal is delivered in this city at present for $5 per ton. Considering its quality, this is very cheap.

The West Side mines were formely owned by Robinson & Rawlins, but are now under the control of a corporation which has a capital stock of $300,000, and are on a sound financial basis. The mines are situated three and one half miles southwest of Coalinga, a station on the Huron extension of the Southern Pacific railroad.

The principal vein is four feet in thickness, with a pitch of thirty degrees. This vein is intercepted by three tunnels, with the usual breasts, and air shafts.

Mr. George W. Hawxhurst, with whom the writer has been acquainted for twenty years, is one of the most expert mining engineers on the coast. He has had charge of mines in British Columbia and at Mount Diablo for twenty-four years past, and is thoroughly capable, besides being intelligent and upright—a man whose opinion may be relied upon. He visted the Fresno mines in 1885, and reported that there was a large body of clean coal throughout the length and breadth of the property, and that he had never seen more regularly defined strata.

The Master Mechanic of the Tulare division of the Southern Pacific has used the coal under boilers for stationary engines, and reports that the Fresno coal burns one-fourth longer than the coal he has been using, giving out in the meantime an equal number of heat units per minute.

In view of the high prices hitherto paid for coal in the San Joaquin valley, these facts have a peculiar interest.—*Fresno Republican.*

A Curious Borax Mine.

W. H. Storms writes to the Pasadena *Union* as follows: In the Calico district is a strange mine called the Borax. Usually borax is obtained all over the world by collecting the accumulations of the bi-borate of soda in the beds of dry lakes, where the borax has been left as a residuary deposit, the same as salt and gypsum. The mine referred to is a vein found inclosed in sandstone and shale, and the borax is mined the same as quartz or any other mineral; beautiful crystalline specimens of snowy whiteness are frequently found. The mine is a geological curiosity.

The origin of the borax mine is simple enough. In past ages the now nearly vertical vein was a bed of borax in the bottom of a dry lake, where the deposit had accumulated by the evaporation of the waters of the lake which contained the mineral in solution. Subsequently the water spread over the land and lake, and mud and sand were carried down into the lake and the borax was covered. This process continued until hundreds of feet of sedimentary deposit had accumulated. In the course of time these hardened and became rocks. When the main range of the Calico mountains was uplifted the borax deposit was also tilted with its inclosing rocks and it now has every appearance of a vein. It follows perfectly, however, the line of sedimentation of the adjacent rock.

A REMARKABLE CASTING.—At the Paris exhibition is shown a single casting consisting of the cylinders, valve chests and frame of a triple expansion engine. The casting appears to be sound and perfect.

Something About Quicksilver.

[Written for the PRESS by HENRY G. HANKS.]

As amalgamation, in which all those engaged in mining or metallurgy are interested, necessitates the employment of mercury, the history of the metal naturally precedes that of its use. We can trace a knowledge of mercury back to the time of Theophrastus, but it was probably in the form of cinnabar, used to paint the faces of savages long before the birth of history.

With the advance of civilization this use for cinnabar not only continued, but was more extensively applied.

Theophrastus, 300 years B. C., wrote in Greek a "History of Stones," the oldest on the subject known. An English translation was published in 1746. Another work in Latin printed in Leyden, in 1647, "Gemmarum et Lapidum Historia," by Anselmus Boetius de Boot, contains a Latin translation of Theophrastus. Both these rare volumes are in the library of the writer.

The following is the account given by Theophrastus of cinnabar and quicksilver, which probably embraces all known on the subject in his time. The reader will please remember that this was written more than 2000 years ago:

"CIII. There are also two kinds of cinnabar, the one native, the other factitious. The native, which is found in Spain, is hard and stony, as is also that which is brought from Colchis, which, they say, is produced there in rocks and on precipices, from which they get it down with darts and arrows. The factitious is from the country a little above Ephesus. It is in but small quantities and is had only from one place. It is only a sand, shining like scarlet, which they collect and rub to a very fine powder in vessels of stone only, and afterward wash in other vessels of brass, or sometimes wood; what subsides they go to work on again, rubbing it and washing it as before. And in this work there is much art to be used, for from an equal quantity of sand some will make a very large quantity of powder, and others very little or none at all. The washing they use is very light and superficial, and they wet it every time separately and carefully. That which at last subsides is the cinnabar, and that which swims above in much larger quantity is only the superfluous matter of the washing.

"CIV. It is said that one Callias, an Athenian, who belonged to the silver mines, invented and taught the making of this artificial cinnabar. He had carefully got together a great quantity of sand, imagining from its shining appearance that it contained gold. But when he found that it did not, and had had an opportunity in his trials of admiring the beauty of its color, he invented and brought into use the preparation of it. And this is no old thing, the invention being only of about 90 years date, Praxibulus being at this time in the government of Athens.

"CV. From these accounts it is manifest that art imitates nature and sometimes produces very peculiar things, some of which are for use, others for amusement only, as those employed in ornamenting edifices, and others both for amusement and use. Such is the production of quicksilver which has its uses. This is obtained from native cinnabar rubbed with vinegar in a brass mortar with a brass pestle and many other things of this kind, others perhaps may hit upon."

Aristotle, who was only nine years older than Theophrastus, has informed us that Dædalus the Athenian inventor, imparted the power of motion to a wooden statue of Venus by pouring in quicksilver. It is also stated that he learned this art from Egyptian priests. But as he is supposed to have lived 1300 years B C., and by some authors is regarded as a myth, Aristotle probably obtained his information from tradition, and, as Herodotus and Moses do not mention that metal, there seems but little foundation for the story.

The only known important localities of mines of mercury in Europe are Spain, Austria and Hungary, and as there are but few mines in Asia and Africa, the Egyptians were probably ignorant of its existence. The story that the Egyptian magicians, in attempting to imitate Moses' serpents, used mercury, must be accepted with caution. It seems next to impossible that they were acquainted with sulpho-cyanide of mercury, of which the modern so-called "Pharoah's serpents" are made.

Theophrastus was an intimate friend and favorite pupil of Aristotle in Athens, and received all his manuscript by bequest. In his celebrated work, "History of Stones," quoted above, he quite ignores the Dædalus story.

Pliny, Dioscorides, Vitruvius and Diodorus Siculus wrote of mercury, but they were nearly contemporary. The lived in the first century, except Vitruvius, whose birth dated back to 46 B. C. All living several hundred years after Theophrastus, it is fair to assume that his mention is the first reliable one in history.

The Romans knew of the Almaden mines long before they were so named, and also those described by Theophrastus. The emperors, taking advantage of the universal admiration for brilliant colors inherent in man, added greatly to the public revenue by controlling the production and sale of vermilion. So great was the demand for this beautiful pigment that the government found it greatly to its advantage to take possession of the Almaden mine, then situated in the town of Sisapon in Bœtica. It was not lawful to work the ores at the mine, but they were brought to Rome with great care in sealed packages, and there purified by a treatment described elsewhere. Two thousand pounds only were imported annually from Spain. Even the price was fixed by law at 70 sesterces per pound (about two dollars and fifty cents).

Metallic mercury was discovered by accident. It will be shown elsewhere that the metal could not have been produced by the process described by Theophrastus, unless his ore contained native mercury, which, however, is not improbable; but he must have seen the metal, and evidently knew no other method of obtaining it.

The next account we have was written 300 years later, or about the date of the Christian era.

Vitruvius was a Roman architect of note, a military engineer under Cæsar in Africa in the year 40 B. C. His life is but little known; his great literary work undertaken and finished in his advanced years treats mainly of architecture. The work was translated into English in 1730, in 1771, in 1812 and in 1826.

He thus describes the preparation of cinnabar and the reduction of a small quantity of metallic mercury.

"They dry the cinnabar in furnaces in which, along with the moisture of the ore, arises a vapor which condenses on the floor of the furnace, forming minute drops which are quicksilver, and which swept together, put in a vessel and washed with water, gradually unite and end by forming one mass. The dried ore is ground up in iron mortars and submitted to repeated calcinations and washings until it acquires the desired color."

Pliny about 70 years later thus refers to the same subject:

"There is a mineral also found in these veins of silver (in Spain) which yields a humor that is always liquid and is known as 'living silver.' It acts as a poison on everything, and pierces the vessels even, making its way through them by the agency of its malignant properties.

"To the fluid humors of minium (cinnabar) we have given the name of quicksilver, for if these are subjected to the action of fire, they will yield silver."

Metallic mercury being discovered, it began to be put to use in a limited way. The art of amalgamation, supposed by many to be a modern invention, was known in the time of Vitruvius, who wrote as follows:

"And when gold is woven into a garment, and that garment has no longer honorable use on account of age, the rags are placed in earthen vases and burned over a fire, the ashes are thrown into water and quicksilver added to them. This collects all the particles of gold to itself and forces them to stay with it. When the water is turned off this is poured into a cloth and the quicksilver is pressed by the hands through the coarse meshes of the cloth. On account of its liquid state it falls outside, and the gold collected by pressure is found pure within."

There is historical evidence that the quicksilver mines of Spain were worked by the Moors, but mainly for vermilion, which they used extensively in decorating their palaces.

Abd-er-Rahman III, or Abdalrahman, was first Caliph of Cordova. Beginning his reign in the year 912, he raised the Mohamedan Empire to its highest state of glory. One of his palaces was named from a favorite slave "Medina Azahra" or "Zahara." It was near Cordova and about 60 miles from the Almaden quicksilver mine. It was magnificently built and decorated. Historians state that one room, the audience chamber, was enriched by gilded statues, that the roof was covered with pure gold, and that in one of the gardens was placed a porphyry tank or basin into which flowed a continual stream of quicksilver.

While this statement may reasonably be doubted, other accounts refer to a porphyry basin filled with mercury, which was used as a mirror and described as reflecting the rays of the sun and moon with great effulgence. Some writers assume that either this palace was a myth or that the descriptions were greatly exaggerated, but it is asserted that there was a palace of this name, that it was also a mint, and that for a long period all the Moorish money was coined there, and that such coins are common with the mint mark "Medina Azahra."

Gibbons' account of this city, palace and garden of Zahara places it within three miles of Cordova, and states that 25 years were consumed in its construction, with an expenditure of 3,000,000 pounds sterling. The buildings were sustained or adorned by 1200 columns of the rarest and the most costly marbles. The audience chamber was incrusted with gold; in the center of the garden, under a lofty pavilion, were placed basins, one of which was filled with the purest quicksilver.

If dependence may be placed upon these historical accounts, it is interesting to know that as early as the tenth century so large a quantity of quicksilver had been collected when no special use for it was known.

The writings of the Arabian physician Rhazes prove that in the tenth century the Almaden mine was worked for mercury and cinnabar, and that the metal and mineral were obtained from that source which Geber used in the preparation of the mercurials, corrosive sublimate and red precipitate; Arab coins, too, have been found in the old workings, some of which, bearing the portrait of Sancho IV and coined in the thirteenth century, were discov-

ered at the end of the last century in the foundation of an ancient furnace near the Castello mine. The Greek name was changed by the Moors to the Arabic one "Al-maden," meaning "the mine." Our word mineral has the same origin. The technical terms, Almadenejos, Azogue, Nabecas, Desmijar, Ahajarrar and Aludel, appearing as they do frequently in the chronicles, show conclusively that these people worked the quicksilver mines of Spain extensively in the middle ages.

From that period until the discovery of America, and the silver mines of Mexico, Bolivia and Peru, mercury was produced in a small way in various parts of the Old World, and as civilization still advanced, it became better known and was put to practical use, but to no great extent.

In 1545 the great silver mines of Potosi in Bolivia were found. This important discovery was followed by those of other mines and districts in South America and Mexico. In 1548 very productive silver mines in Zacatecas, Mexico, and others in Cerro Pasco, Peru, were opened and extensively worked.

The Spaniards, who had devastated America in their search for gold, reluctantly turned their attention to the less noble metal, silver, which for many years was enormously produced; with what effect on Spain, and indirectly on the Old World, is graphically pictured in the writings of Robertson, Raynal, Jacobs and Chevalier.

The conquerers found the Mexicans working the ores of the small mineral veins they knew of by a rude system of metallurgy, which was in effect a simple smelting process. These methods were continued, with some improvements, until 1557, when Bartholome Medina discovered or invented the Mexican Patio process for extracting the metal from low-grade ores in a large and more economical way, using quicksilver for the first time, as far as is known, in the reduction of ores containing no free silver or gold. Mercury had long been in use in Hungary and elsewhere for the collecting of native gold, but the Spaniards were the first to amalgamate raw ores and decompose them by treatment and amalgamation.

Medina was a native Mexican miner, ignorant of scientific metallurgy, and it has ever since been a source of wonder to metallurgists how he could have invented a process which proved so successful that it is still employed in Mexico and South America, with but little change from his system of manipulation, as described in the writings of metallurgists of his time. The new process was soon extended to all the silver mines in Spanish America, creating a demand for quicksilver never before known.

In 1639, Alfonso Barba's work on amalgamation appeared in Peru, and Gabriel Plattes, in the same year, described in an English work the amalgamation process for saving gold and separating silver from its ores. Barba's work, "El Arte de Los Metales," was republished in Madrid in 1640, and is believed to be the first work ever written on the art of amalgamation. In it the Medina process is described in detail.

In the year 1566, Don Pedro Fernandez de Velasco applied quicksilver to the extraction of silver from its ores, first in some mines in Mexico and afterward, in 1571, in similar mines in Peru. It was thought by some authors that he was the inventor of the process, but he probably copied the method of Medina. Be this as it may, the new process was soon introduced into all the silver mines then known. It revolutionized and cheapened the production of gold and silver. While low-grade ores were treated by this process, the richer ones were for a long time smelted as before.

Until the discovery of the Peruvian quicksilver mines of Guancavelica in 1564, all the mercury used in the American mines was sent from Spain, which did not cease until the great Santa Barbara mine began its enormous yield.

Some idea of the importance of this mine may be gained by the following figures:

From 1570 to 1789, the product, according to Humboldt, was 47,285 tons of the liquid metal. From the latter date the yield began to decline, and up to 1845 was only 3000 tons. When silver mining became less productive there was a period of comparative inactivity in the production of mercury, although it was still somewhat largely consumed in the arts and in medicine as well as in mining, until the discovery of gold mines in California followed by similar excitements in Australia, New Zealand and elsewhere, which gave a new impetus. And had it not been for the fortuitous discovery of an abundant supply of the indispensable metal in California, much of the gold taken from our placers would have gone to enrich syndicate owners of European quicksilver mines.

The ancient Greek name for mercury was hydrargyrum, literally "silver water," Latinized by the Romans. The modern chemical symbol (Hg.) is an abbreviation of this word. Another Latin name "argentum vivum," led to the modern English one, quicksilver. The ancients not being chemists, judged all bodies by their physical properties. They believed hydrargyrum to be silver in some allotropic condition, and made a distinction between "argentum vivum" (native mercury) and "hydrargyrum," the same metal obtained artificially.

Another name given by the ancients was: Water that does not wet the hands "aqua non modefaciens manus." If it does not wet the hands, it wets other metals to that extent that it must be driven off by heat before it will relinquish its hold. The alchemists named the metal from the Greek mythological diety Mercury, and represented it by the caduceus or winged rod of that god, intwined by two serpents, or a modification of that symbol. The Spanish word "azogue" is of Arabic origin.

It is curious now to trace the interest taken by the alchemists and older scientists in this remarkable metal, and the following list of names by which it was known will show how frequently it must have been referred to in alchemistic and older writings.

Ancient, Modern and Alchemistic Names and Synonyme for Mercury.

A. Adib, adibat, æterni, alcarith, alcharith, alecharith, alembic, alembicum, alemarcasita, alkant, alohar, alohoc, alogar, aloeat, alosohoc, altaris, altarit, aludit, anatris, an fir filius, anterit, aqua argentea, aqua non modefaciens manus, argentum fusile, argentum fusum, argentum mobile, argentum vivum, arohot, argentum liquidum, argentum aqueum, avraric, azoc, azoch, azoth, azogue, azot.

B. The letter B.

C. Cheizi, chesmech.

D. Dædalus.

E. Ebeemech.

F. Fugitivus servus, fumus albus.

G. Geryon.

H. Holy-water, hydrargyrum, hydrargyrus, hidrargirum.



CLOVER CREEK FALLS IN THE SHASTA REGION.

L. Liquor metalicus, lorus, lunificus, liquor ætenalis.

M. Massalis, massarium, mater metallorum, mercury, mercurius, mercure, mercure vierge, metallum fluidum, mussalis.

Q. Quicksilver, quecksilber.

S. Spuma argenti.

U. Uxor.

V. Virgin mercury, vif argent, vomica liquoris æterni.

W. Water of metals.

Z. Ziabec.

THE USE OF A GOOD MATERIAL THE BEST ECONOMY.—That economy lies in the use of a good material, and not in cheap stuff, says the *Master Mechanic*, was well illustrated on one of the large Ohio roads recently. The newly appointed superintendent of motive-power found that the valve oil used on the road was a mixture of black oil and tallow, the total cost of which was 32 cents per gallon, and that the average mileage per quart was 100 miles. He also found that one valve seat was being faced every day in the shops. A change was made to valve oil costing 50 cents per gallon. This is giving an average mileage of over 200 miles per quart, and it has been necessary to face only five valve seats in four months.

A LARGE deposit of petrified clams has been found near the top of Flat Butte, Mont.

SENATOR JONES of Nevada has given $10,000 for building a new pier at Santa Monica.

Alaska Gold Mines.

A correspondent of the Santa Rosa *Democrat* says:

A year ago Alaska had only one paying quartz-mill; now she has a number of small mills running with success. The principal mill is, as every one knows, at the famous Treadwell mine. This mine has been worked for a number of years. The loose dirt and decomposed quartz were sluiced, which paid for several years, but finally the largest portion of the loose gold being washed out, and the value of the quartz not being known to its owner, the mine was sold to the Alaska M. and M. Co. for $1500, both parties being well pleased. Shortly after this company gained possession, a 180-stamp mill was built, which has run since that time. Last year 160 more stamps were added, making 340 in all.

The next mill in size is the Bear's Nest. Last June a company was organized below under the name of the Alaska Gold Co., with a capital of $2,500,000, having Charles E. Benn of London, England, for president. This corporation purchased the Bear's Nest group, embracing the largest portion of five claims, and located on this island. Early in July this company commenced active operations by having a tunnel surveyed and setting a force at work on the same, and have continued work since that time. The tunnel enters cover a little above high-water mark, or about 100 feet below that of the Treadwell, which joins it on the south. It was estimated by Deputy U. S. Mineral Surveyor G. W. Garside that the tunnel would have to be run in 1052 feet before the ledge could be tapped. Last Tuesday the ledge was tapped at a little less than the estimated distance. After tapping the ledge (which indicates well and promises to be equal if not superior to its sister ledge, the Treadwell) and penetrating a short distance rich ore was found, which assays $500 to the ton. It is not ascertained yet whether it is a body of ore or a stringer, but it is supposed to be the latter.

This property has gained wide-spread notoriety from the price paid for it, $2,500,000. The eyes of the ledge-holders of Alaska have been watching its development closely. It has at last given this country a lift. On April 22d the steamer Ancon landed here with 24 carpenters in the employment of Grant & Grady of California, who have the management of the erection of the buildings on the property. The sawmill belonging to the A. M. & M. Co. was leased, and has been running night and day since that time till a few days ago, when the night shift was taken off. The boarding-house accommodates 200 men. The mill will be taken to its site as soon as the railroad is finished. The latter will run from the A. M. & M. Co.'s wharf to the sawmill by the Bear's Nest mill site. This road will be less than a mile in length, and will be the first railroad in Alaska.

Other properties here are fully as good as the two which I have described, but they are owned by poor men, and, the rock being of low grade, it requires considerable capital to work it with success. In the hands of capitalists of means such property would be a bonanza. Alaska is young in her mineral discoveries, but as soon as capitalists get enough of her property in their hands she will grow rich and prosperous. At present this country is not good for a workingman, as wages are low and most of the work endangers his health through exposure.

A rich ledge was discovered about 60 miles below this place, which has created quite an excitement. It is reported to be of an immense size, and assays 500 ounces of silver to the ton. The rock also carries 17 per cent copper and a trace of gold. In regard to the Yukon mines, there have not been any very rich strikes made among them yet, as there are only three months in the year suitable for work in that region, and to winter there costs a person at least $500. Sluices cannot be worked, as the river has not fallen enough to get water at the bars. Ground that a man cannot rock out $17 a day will not justify him to work. It is reported that there will be a steam pump or two taken in by the mouth of the river this spring, and it is generally believed they will be successful, as there is ground there where a man can rock from $5 to $8 a day, but it will not pay him, because he cannot sluice it. If he could, it would be a fortune to him. This the steam pumps will remedy. The only men who made even moderate wages there were those who had extra ground and stayed with it two or three years. The largest sum that any person came out of there with was about $12,000. A number have come out with from $3000 to $10,000.

Ivanpah Mines.

One of the oldest and most successful mining and milling operators on the coast, Mr. J. A. Bidwell, is in the city. In 1866 Mr. Bidwell was sent to California by a Wall-street syndicate to look after some mining property, and it resulted in his remaining here permanently, and there are few men who have a wider acquaintance with mines and miners. During the past eight years, Mr. Bidwell has been operating in the silver and lead mines at Ivanpah, and with great success. The camp is made up wholly of miners and a few supply stores. It is 75 miles from Fenner, the shipping-point on the Atlantic & Pacific railroad, in the desolate, arid country, not many miles south of Death valley. One would think that life would be a burden up there, but its dreariness is compensated for by the wealth its inhabitants are accumulating. There is no richer silver and lead district in California, and, with the coming of the Salt Lake road, there will be beyond doubt a great influx of capital and very extensive operations. Speaking of that much-talked-of and hoped-for road, Mr. Bidwell is decidedly emphatic that the road will be constructed. There can be no doubt at all about it, he thought. In fact, the gentleman is possessed of some information which makes it a certainty.

He has been all over the country through which it will pass, and says the construction will be attended by very few serious obstacles; that nearly all the route lays through a region where the work will be comparatively easy. The particular result thus to be reached would be the opening of the iron deposits at Iron mountain, Utah, where iron and coal abound, and can be easily worked. There is all the water that can be desired, and the conditions are such as to make it inevitable that great iron works would be established there.

Mr. Bidwell says that the people at Ivanpah are very confident the line will be built soon, and that it will come very close to that town, and the result will be, a vast region will be thrown open and made accessible. A very rich lead deposit, the best that has ever been found in the West, would be tapped by the line, and the country become directly tributary to Los Angeles.—*Los Angeles Tribune.*

CLOVER CREEK FALL.—We give on this page one of the smaller gems of the scenery of the Shasta region, the falls in Clover creek, which are situated about 40 miles northerly from Redding. The scene, as the engraving shows, is wild in the extreme, and is made up of rocks with their scanty, clinging vegetation, as the environment of the waterfall, which is of no mean dimensions. The scene has elements calculated to please the romantic, the nature-loving, or the piscatorial mind, and is another reminder of the delights of the mid-summer outing upon which the PRESS has frequently expatiated.

CORPORATIONS CAN LOCATE MINES.—The Supreme Court of the U. S. has decided in the case of Alexander B. McKinley, plaintiff in error vs. Jerome B. Wheeler et al., that a corporation created under the laws of one of the States of the Union, all of whose members are citizens of the United States, is competent to locate or join in the location of a mining claim upon the lands of the United States in the like manner as an individual. This decision has been rendered upon an appeal from the Circuit Court of the United States for the district of Colorado that had decided to the contrary.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

VOLCANO.—Amador *Ledger*, July 6: Mining matters are looking up considerably at Volcano. The operations on the Cleveland cement and gravel claim are likely to bring the camp into prominence once more as a mining center. The roller mill was started on its career of pounding out the gold from the hard cement, and it not only works well, but the yield of gold is said to be satisfactory. There are between 20 and 30 men employed on this claim. The number of employes is being steadily increased, and it is expected that it will give employment to 40 hands when in full blast. The Loyal Lead property in the Black hill, near Drytown, has been bonded to an English Co. for four months for $40,000. At a meeting of the Alpi directors last week, it was decided to have a five-stamp mill put up on the claim at once, and B. F. Taylor was authorized to make the necessary arrangements.

THE ZEILE sulphuret works were started up this week. The work of repairing the shaft is completed, and in a few days it is expected that all the stamps of the mill will be in motion once more, for a long and continuous run. A new 12-inch pipe is being laid from the South Spring hill reservoir to the mill. Ten stamps are to be added to the mill, for the purpose of being employed on rock from the Talisman, and the increased water supply is thus rendered necessary. The Allison mine above Big Bar bridge, owned by Tripp and Petrie, is running a low grade ore, which does little more than pay running expenses. There is said to be plenty of better rock in mine, below the tunnel level. Sinking operations will have to be inaugurated before this can be worked.

Calaveras.

THE LAVA BED GRAVEL MINE. — Calaveras *Chronicle*, July 6: This mine is situated in Railroad Flat Mining District, about one and a half miles south of the town of Railroad Flat and near the road leading to El Dorado. Messrs. Lampson, Evans & Co., the owners, have been prospecting this mine for five years, but never with much success until about eight months ago, when they at last reached the long-expected channel. They have done their work through shafts, there being no chance to tunnel without running a great distance. The first shaft they sunk was 57 feet to the bedrock, or north rim of the channel. An incline was run from this shaft following the bedrock a distance of 75 feet, when they found the "wash," but the water came too fast for them to handle through the incline and shaft, and work was abandoned in that place. They then went south, a distance of 200 feet and sunk another shaft. This time they found what was supposed to be the south rim. This shaft was 52 feet deep, and they run an incline 35 feet on an angle of 45 degrees. About 20 feet from the shaft they came to the channel which prospected well and gave indications of an extensive mine. At the end of the incline the bottom of the channel was reached, when a drift was run north, or across the channel, a distance of 20 feet, one east, or up the channel, 50 feet, and one down 12 feet. The gravel from these drifts was all washed just as it came out, the drifts being about six feet high and all in gravel. The output was three dollars to the carload. With this prospect and the extent of their claim the owners feel confident of having a valuable property. They have about one and a half miles in length on the channel. The company have this spring put up a whim to hoist the gravel and water, and built a dump box with a capacity of 140 carloads, and 300 feet of flume running from it. The blue gravel will be washed in this box with a small hydraulic. The shaft has been substantially timbered and lined, and the drifts are now being widened preparatory to breasting out gravel.

THE THORN MINE.—*Prospect*, July 6: The "Ben Thorn" mine near San Andreas, has been bonded to H. H. Allen, a gentleman from San Francisco. It is understood that this gentleman will immediately sink on the 80-foot shaft which is already there, and will, in a short time, if the mine proves satisfactory, build a mill. It is said that the gentleman named above is pleased with all the present indications of the mine and will thoroughly work it. B. K. Thorn reserves an interest in the mine.

El Dorado.

PLACERVILLE.—*Observer*, July 9: Sinking is going on regularly at the Pacific shaft. The company is now making a sinking of 300 feet from the 700-foot station, which will give them a depth of 1000 feet, where a station will be established from which crosscuts will be made to different ore chutes contained in the group. It is not intended, as we are led to believe, that sinking will cease till the shaft has reached a depth of 1600 feet, which will give (after crosscuts have been made) ore backs sufficient to supply a large number of stamps for a length of time not now to be estimated. The west crosscut from the 700-foot station, is nearing the Rose ledge. When this connection is made, ore can be rapidly brought to the surface from both the Rose and Pacific shafts. A large vein of excellent ore is now shown in the Rose shaft. Prof. Price is not at all excitable and accepts no theory for fact, still he is well pleased with the large ore body developed in the opening of this shaft. The ore is of high grade. The company has its mill about ready to run. They are putting in as an experiment both Frue and Golden Gate concentrators, and after testing them, will decide which, if either, they adopt for general use. Work is being prosecuted as rapidly as possible in enlarging the shaft to the 400-foot level at the Church mine. It is the intention after the enlargement is complete to make another sinking of 200 feet. A few men are working at the Vandegrift mine with very flattering prospects. They have a ledge four feet wide of ore showing well in free gold and sulphurets. At the True mine the main tunnel is now in nearly 2000 feet in vein matter. Several chutes of good pay ore have been run through on the line of the tunnel. They are now making a crosscut to strike the west wall. Stringers of ore are found. Mr. Chas. J. Parker informs us that work is now being prosecuted at the Stillwagon mine, south of Grizzly Flat. At the 1600-foot level, at the Springfield mine, there is a ledge 16 feet wide of ore of fair grade. It is expected that new hoisting works will be placed on this mine before long. The north drift at the Rogers mine, Smith's Flat, is running into a promising bench of gravel. Good prospects are being found in the Stewart mine at Weaver hill.

Fresno.

THE OLD HARRON MINE.—Fresno *Expositor*, July 9: In February last Clark & McKenzie bought into the mining property known as the old Harron mine, together with J. C. Hoxie and W. L. Witt, both experienced miners. The new firm determined to commence at once and develop the mine, and starting two incline shafts they have pushed steadily forward until both shafts have reached about 100 feet below the surface. The shafts follow the ledge of rocks, which on the surface is six inches wide. But one shaft has now reached a point where the ledge is some 20 inches wide, while the other shaft has developed a ledge of gold-bearing rock six feet wide. On Saturday last Messrs. Clark & McKenzie paid their mines a visit, and on their return last night they brought with them amalgam to the value of about $950. Mr. Clark was found in his office to-day by a reporter, and asked for some facts. He was not anxious to talk, "for," said he, "we don't want to sell the mine, and have no special desire to advertise it. However, I have no objection to telling you what we have done. We began working ten men in February last and have kept them steadily at work. Any one familiar with mining will appreciate the expense we have been under by sinking two shafts 100 feet in depth each, building an arastra and keeping our hands, besides the hundred and one little things that all count up in the course of a month, and yet our mine has not only paid every dollar of this expense, but netted a little surplus. The mine is situated on the headwaters of the north fork of Little Dry creek. We did not commence crushing our rock until March last, and have crushed only the best rock since that time. The arastra, you know, is a primitive method of reducing quartz or rock. The process is very slow. I presume that with an ordinary 10-stamp mill we could have crushed in one day all the rock we have reduced in the arastra since March last. For this reason we have used only the best rock, and it has averaged from $70 to $130 per ton. And without any desire to boom the mine, for, as I said, it is not in the market, I can say there has been far more tons at $130 than at $70. The low-grade rock we have piled up at the mine, and if our speculations are realized we will soon put in a 10 or 20-stamp mill. I say our expectations, but in reality we expect nothing. The second-grade rock ought to run from $20 to $50 or $60 a ton, and with a mill that will pay us handsomely to handle it.

Inyo.

THE OLD PLAGUE.—*Independent*, July 6: That old curse of the mining industry, that has been so fruitful of evil all over California, has fallen upon the Maxim property. A little over five years ago, Harris & Rhine of Independence were appointed the legal agents and representatives of the Maxim Mill and Mining Co. The mill was sold for taxes and was bought by Harris & Rhine. The firm supplied goods to the company, and quite a bill was run up. When Mr. Harris retired from the firm, all claims against the property passed to Mr. Rhine. Last December Mr. A. Davidson, as the representative of the Maxim Co., made an agreement with Mr. Rhine, by which he bound himself to pay the latter what was claimed by him, amounting to over $5000; said payment to be made on or before July 1st of this year. Should this agreement not be made good by Mr. Davidson, Mr. Rhine was then to have the property. About two weeks ago Mr. C. H. McConnell who is interested in the property came here from New York. Mr. Rhine being in San Francisco, he went there to meet him and try to effect a settlement. This, it appears, could not be done, and on Monday last a complaint was filed on the part of the Maxim Mill and Mining Co. against Nathan Rhine. This is almost certain to tie up the mines and mill for a long time to come.

CERRO GORDO.—*Register*, July 4: Archie Farrington came up Tuesday on the train. We learn that the Cerro Gordo mines are bonded by a strong syndicate, which he represents, and that the indications for new life for that camp are favorable indeed.

Napa.

QUICKSILVER SHIPMENTS.—*Calistogian*, July 3: During the month of June quicksilver produced at the mines below mentioned was shipped from Calistoga as follows:

Napa Con. Mine,	flasks	385
Bradford,	"	188
Sulphur Bank,	"	212
Lynn Bros.,	"	3
Total flasks		788

The Napa Con. Co. paid another dividend of 10 cents per share Monday last.

Nevada.

EAST EUREKA MINE.—*Tidings*, July 2: Supt. Weldon of the East Eureka informs us that his company has determined to put in a compressor drill, which has already been secured, and to sink the shaft an additional hundred feet. The steam plant on the mine is adequate to furnish the extra power. The East Eureka is 500 feet in depth, and from this level a crosscut has been run and the fissure found. The company has been disappointed, however, for the walls (well-defined and identical with those enclosing the Idaho ledge) are close together, while 200 feet above they are from 7 to 12 feet apart. A strong stream of water flows from the fissure in the crosscut from the 500-foot level. This is a very favorable indication, and better walls could not be asked. Although disappointed, Mr. Weldon is positive that with the additional hundred feet in depth he will have a mine.

THE IDAHO MINE.—*Tidings*, July 8: This morning the bulkhead between the 700 and 800 foot levels of the Idaho mine was removed and preparations made to expel the foul air from the levels below. No smoke or other indications of fire are apparent. A large air fan is being operated in the old pump shaft, and in the main shaft a two-foot box, as nearly air-tight as possible, is being placed in sections below the 800 level to constitute an exhaust. As the sections are put in, the air is rendered pure for a foot below the mouth of the box. A candle lowered an additional foot is immediately extinguished. The extent of the damage to the mine by the fire will soon be ascertained.

Placer.

OPHIR DISTRICT.—Placer *Republican*, July 6: C. A. Cooper says Ophir mining district never looked so encouraging as now. At the Hartley mine they have a shaft down 100 feet, from which a drift runs north 50 feet on a three-foot ledge of splendid ore. A drift also runs south 75 feet on ore which will go at least $12 a ton. This drift will be extended 150 feet further, under a contract. The old Buckeye mine which was started up a month ago is also showing rich rock, and good things are expected. The old Eclipse mine, one-half mile this side of Ophir, was also started up last week by J. B. Patterson, with four or five men. This mine has been idle for 12 or 15 years, but it is known to contain good quartz, and Mr. Patterson will put up a ten-stamp mill this summer. In the whole district there are more mines running than at any time before for 12 years.

Shasta.

IGO.—Cor. Shasta *Courier*, July 6: A Red Bluff Co. has secured an interest in the Crystal mine, and is extending the lower tunnel to strike the ledge. The same company is negotiating for the Chicago and the first extension north, with a view to working them jointly. P. Gibney is crosscutting from the bottom of his shaft. He has passed a seven-foot ledge of ore. The main ledge has not yet been reached. Robinson & Son are taking good ore out at the Black Prince. Charley Rossle is building an arastra near the mouth of Andrews creek. Asa Williams is running his arastra on fair ore. Wright's arastra is running on ore from the Andrews creek side. Shirland & Bros.' arastra is running on Atlantic ore. E. L. Ballou's arastra is running on Falls ore.

Sierra.

TELEGRAPH.—*Mt. Messenger*, July 6: The Telegraph M. Co. met on the 30th of June and organized. R. Stevenson, D. T. Cole, H. Spaulding, R. Forbes and John Costa were elected directors for the ensuing year. At the directors' meeting held immediately after R. Stevenson was elected president, D. T. Cole vice-president, H. Spaulding, treasurer, P. R. Gardner, general manager, and F. R. Wehe, secretary. In addition to the above, A. Hart, H. H. Squire, W. W. Mason and John Mitchell are large stockholders in the company. The company owns about 600 acres of what is called the Telegraph channel, supposed to be an extension of the Chapperal Hill and Eureka lead, and it is now having the ground surveyed for the purpose of getting a patent. They also intend commencing to develop the property at once. The incline on the Wallis Consolidated M. claim is now down 50 feet, it being two weeks since work was commenced. The tunnel is being put down between the bedrock and lava. The work is now in a nest of bowlders, which is not a bad sign. W. Lawry and H. M. Bradbury have taken the contract to sink to the bottom of the channel.

Siskiyou.

QUARTZ AND GRAVEL.—Yreka *Journal*, July 3: We learn that the old Lindsey quartz ledge at Oro Fino, near Fort Jones, Scott valley, is again paying very rich, Hand & Co., the present owners, having taken out nearly $1800 lately in a very short time. In the Oak Bar section of Klamath river, the river miners are getting along nicely, and must be doing well, judging from the large amount of supplies shipped every week from Yreka; and the same may be said of the Honolulu district on the same stream, also at Humbug creek, these several localities helping Yreka very materially in the way of trade and business. Leonard has about pumped out his claim at Hamburg Bar, and will soon commence hoisting pay gravel. Martin Andrews at same place is busy getting ready to pump, his wing, head and foot dam being almost ready. Osborne & Co., on the Upper Klamath, near the Anderson ferry, are about ready to take out pay gravel. Jno. Waggoner & Co. in same section are already taking out pay gravel with good success, and Wm. Pullen will commence in a few days.

Santa Barbara.

BEACH MINING.—Lompoc *Record*, July 6: The Launer Beach M. Co. washed out 12 ounces of gold Monday. This is the greatest day they have had. The black sand was so clean of the white that gold could be seen on the beach. This same ground has been cleaned several times. Each flood tide brings in its quota of the shining dust. Where does it come from and how long will it last is the query.

Tuolumne.

RAWHIDE MINE AND MILL.—Sonora *Democrat*, July 6: This property, near Jamestown, has lately been sold for a large sum by Edmund Greene of Oakland to W. A. Nevills of San Francisco. The mine is on the mother lode, the vein is strong, and was formerly worked extensively and successfully, though operations were conducted at that time without system and very extravagantly. It is now to be operated with energy and judgment and will be soon added to the many paying mining properties of this county. The mill is a first-class steam 20-stamp mill. The hoisting works, also steam, are to be removed and re-erected 500 feet to the north on the vein and a contract has been given to the Sonora foundry to do the work.

KANAKA MINE.—It is authentically reported that this mine, near Groveland, in the southern part of the county, and owned by Mr. Wm. R. Shaw, has been sold to San Francisco parties for a very considerable sum. It has now a five-stamp water-mill, and the number of stamps are to be increased to 15 and probably to 20. The mine is thoroughly opened 600 feet deep and shown to be valuable and lasting.

GOLDEN GATE MINE.—This mine situated 1½ miles from Sonora to the southwest, has been developed systematically, and the good work done on it now demonstrates its great value, having a pay chute 600 feet in length of sulphurets of unusually high grade and large percentage. Works for reducing the sulphurets and a 10-stamp water-mill are being erected, and the work has been energetically started and will be pushed. This mine is peculiarly a sulphuret mine and promises to be the leading sulphuret mine of the State. The ore carries very little free gold. The wealth of the mine is in the sulphurets. This mine, and also the San Guiseppe mine situated near Sonora, violate in a striking manner the almost universal rule, that sulphurets in a mine are usually rich in proportion to the free gold. The sulphurets of both go into the hundreds of thousands per ton, and yet neither contains free gold enough to work profitably. In this connection it is worthy of note that the Bonanza mine, in the same vicinity, that has yielded hundreds of thousands of dollars in massive free gold, contains sulphurets that are of no value. This is the reverse of the former case and another marked exception to the rule.

MARY ELLEN MINE, also situated in the southern part of the county, near Tuolumne river, is being furnished with a mill under charge of Mr. Wm. Sharwood, and the developments on the mine show that it will soon be one of the leading gold mines of this section of the State. The blanding concentrator to be placed in this mine is about finished.

SULPHURET WORKS are being built near Sonora by Mr. Maltman, and are conveniently located to the several sulphuret-producing mines. They will be employed on custom work and will supply a need long felt.

Trinity.

CANYON CREEK QUARTZ.—*Journal*, July 6: Geo. Bailey was in from Canyon creek this week, and gives us the following in regard to his new find: He discovered the ledge on the 22d of last May, and with Grant Flowers has three locations. The ledges are situated about 4½ miles from the town of Canyon Creek, near the summit of the ridge dividing Canyon Creek and Steuart's Fork. There are three parallel ledges distant from each other about 75 feet; the largest is 7 feet in width, the other two, 5 and 6 feet in width. Each ledge carries free gold and prospects well. The upper ledge on the surface is decomposed for a distance of three feet from the hanging-wall, while about as much more solid quartz adheres to the footwall. The formation in which the ledges are found is porphyry. They are now running a tunnel to tap ledge No. 1 at a depth of 50 feet, and, on reaching the ledge, can drift to any depth desired, as the ledge dips at an angle of 65 degrees. After striking the ledge in the tunnel, the owners will know whether they have a bonanza or not. If the ledge is found at the depth of 50 feet of the same character as on the surface, it will prove a veritable bonanza. Dedrick, Jones & Grigsby have some very flattering prospects on their locations.

NEVADA.

Washoe District.

BULLION.—*Enterprise*, July 6: Running north on the ledge on the 760 level. Are now distant from the shaft 175 feet.

HALE & NORCROSS.—On the 400 level the stopes in the north drift from No. 1 west crosscut continue in ore of good grade. On the 500 level the north drift was extended 21 feet. All the stopes are looking well. On the 600 level the north drift was advanced 35 feet and connected with the south drift from No. 2 crosscut. These drifts expose considerable fair-grade ore. From the 600 and 700 levels are not extracting the usual quantity of ore on account of the scarcity of water which has reduced the crushing capacity of the mill. Have men on repairs in all parts of the mine where needed, and a portion of our force are engaged in retimbering the shaft. During the week have hoisted 252 cars of ore, and have shipped to the Nevada mill 465 tons and have milled 625 tons. Average assays, $29.44.

SAVAGE.—From Nos. 1 and 2 west crosscuts are stoping fair-grade ore, and also extracting ore from the old stopes in the north and south drifts. On the 500 prospecting drift from the upraise was extended 18 feet; face in quartz showing spots of good ore. Are extracting ore from the old stopes in the south drift. Extended crosscut No. 2, which is now advanced 2955 feet. During the week have hoisted 451 cars of ore and shipped to the Rock Point mil 502 tons and milled 490 tons; average battery assay, $20.07.

BELCHER. — The 1200 level, south drift, is in quartz, giving fair assays. The joint raise with Seg. Belcher from the 1100 is nearly connected. Will start an upraise from the 1200 as soon as the south drift on that level gets under the 1100 level winze.

SILVER HILL.—Northeast drift, 260 level, has been advanced 15 feet; distance from shaft 345 feet; face in quartz and porphyry. Raise in southeast drift, 160 level, is up 80 feet; distance from shaft, 670 feet; formation, gypsum and quartz.

CONFIDENCE.—The Joint Confidence, Challenge, and Imperial north drift on the 500 level has attained a length of 757 feet from the Yellow Jacket shaft, 29 feet having been added during the week. The face is in quartz, giving low assays.

OVERMAN.—Have run the mine six days. Extracted 248 tons of ore, and shipped to the Vivian mill 248 tons. At the top of the upraise from the east drift have extended the south drift 25 feet; total length, 84 feet.

CON. IMPERIAL.—The north drift on the 300 level is now in a distance of 215 feet from the south line of the mine, having been advanced 37 feet during the week. The face shows porphyry.

SCORPION.—On the 520 level the new east drift from the Sierra Nevada shaft is advanced 628 feet. No change in the character of the ground since last report.

CROWN POINT.—The 500 raise is up 92 feet, and the ground is becoming somewhat softer as they advance. Shipped to the mill during the week 829 tons.

POTOSI.—South lateral drift on 750 level is out 22 feet; face in quartz and clay. South lateral drift, 850 level, is out 480 feet; face in hard porphyry.

YELLOW JACKET.—Will resume the shipment of about 100 tons of gold ore daily to the Brunswick mill, which will hereafter run by steam.

NEW YORK.—North lateral drift from the northeast crosscut, 800 level, is out 100 feet. This drift is following the east side of the ledge.

SEG. BELCHER.—The 100 raise is up 132 feet. The top of the raise shows a streak of quartz two feet wide, which gives fair assays.

CHOLLAR.—East crosscut, No. 3550 level, 150 feet south of the north line, is out 17 feet; face in quartz showing bunches of ore.

BALTIMORE.—Continue to extract ore of good grade from the crosscuts on the 225 and 338 levels.

JUSTICE.—The north winze is down 67 feet and the bottom shows four feet in width of good ore. The shaft is down 101 feet, and the bottom is in

very hard rock. Shipped to the mill during the week 223 tons of ore, the average battery samples of which was $36 a ton.

ALTA.—Are running the mill steadily, and the mine is yielding the usual quantity of ore.

Eureka District.

RICH GOLD ORE.—Eureka *Sentinel*, July 6: Johnny McNaughton has placed on our table a specimen of ore from the gold belt of Prospect mountain, which is almost the pure quill itself. It is flecked with gold visible to the naked eye. There is a large section of Prospect mountain in which gold largely predominates the ores. The Silver, Connor, Williams, Matamoras and others are situated in this belt on the west side. Over the crest on the eastern slope, just opposite, the San Jose has yielded ore going as high as $246 to the ton in gold. The rich samples of gold ore constantly being found in the region under notice are of the greatest importance. They mean something with greater explorations. The truth is that the depth and strength and strike and inclination of the ore channels of the grand old mountain are not yet understood. When they are there will be no trouble to develop rich and large paying mines in that quarter of our district.

THE DIAMOND MINE.—An excellent improvement was shown in the Diamond mine by a little work in the ore body last week. The tunnel has been completed and an upraise started for the ore. Negotiations looking to the sale of the property seem to be progressing satisfactorily.

Tybo District.

DIMICK.—Belmont *Courier*, July 6: The Dimick mine at Tybo is yielding its usual quantity of good ore.

Morey District.

LOOKING BETTER. — Belmont *Courier*, July 6: Henry Metz informs us that the mine at Morey is looking better and better as work of development advances. The ore encountered is of a high grade, and the lessees are extracting large quantities of it. The company's mill will remain closed until Supt. Cohen procures a first-class millman to run it. Morey is a lively camp this summer.

Ophir Canyon District.

A BIG WATER-WHEEL.—Reese River *Reveille*, July 8: Jake Gooding tells us that he and his partners, a crew of four, are developing right along their gold mine at Ophir canyon, and that by the time there is sufficient water to turn the over-shot wheel they will have on the dump a number of tons. Snow & Co. of Reno are building a 40-foot overshot water-wheel by contract, which will be sent to them some time in the fall in separate parts. During the winter the men will stope out ore on the ledge to have plenty on hand for the run in the spring, as they expect to crush about ten tons daily when they get started. There is no water running in the canyon at the mine—the first time it was ever known to dry up since there has been a camp there.

Pittsburg District.

MILL SHUT DOWN.—*Silver State*, July 6: The Pittsburg Co.'s mill in Lander county is shut down because of the scarcity or water. The mill belongs to the English company which is mining extensively in Pittsburg district.

Tuscarora District.

BELLE ISLE.—*Times-Review*, July 7: West crosscut, from the end of the north drift, 250-foot level, has been extended 10 feet.

NEVADA QUEEN.—Winze from 450-foot level has been sunk 8 feet; total, 54 feet, bottom being all in vein formation, 18 inches being good ore, average assay $212 per ton. Crosscut on 350-foot level advanced 10 feet; face somewhat softer and some water. South drift from 150-foot level of Commonwealth advanced 8 feet in low-grade ore, with some seams of high-grade ore mixed in the face.

COMMONWEALTH.—Stopes throughout the mine are looking as well as at any time heretofore. Two hundred and thirty tons have been sent to the mill; average battery assay, $119 per ton. Bullion shipped, $16,018.92; crude bullion on hand, $8000. Mill was shut down yesterday—the 4th. Will start up again this evening, after making some slight repairs.

NORTH BELLE ISLE.—Crosscut west from the 300-foot level station has been extended 15 feet; total length, 85 feet, encountering seams that yield fair assays. On the 500-foot level some timbering has been done the past week, and progress has been slow. Have started to crosscut to the vein, 40 feet south of the north line.

DEL MONTE.—North drift on the 100-foot level extended 5 feet. East crosscut, same level, advanced 14 feet. No material change in the workings the past week.

NORTH COMMONWEALTH.—East crosscut, from the end of south drift, 100-foot level, has been extended 12 feet through vein matter carrying some high-grade ore.

NAVAJO.—South drift on west vein, 350-foot level, has been extended 11 feet, showing faces of ore. Upraise on east vein is up 30 feet, and shows some good ore.

GRAND PRIZE.—The stopes continue to yield about the same grade and quantity of ore.

ARIZONA.

UNITED VERDE.—Prescott *Courier*, July 4: United Verde mines are producing rich carbonate ores. Supt. Giroux, miners tell us, is doing better than most any of his predecessors. The ores are rich in gold and silver, hence the output is not affected by price of copper. Smelters are running free and Mr. Witherell, the freighter, is doing his part, furnishing coke and hauling out matte and bullion. There are in the district outside mines that will shortly be worked and made pay.

VULTURE.—Wm. A. Farish, a trusted mining lieutenant of Senator Tabor, owner of the Vulture, will immediately put men at work sinking from the bottom of the 400-foot incline, in good ore. As water exists at this depth, Mr. Farish has reason to hope that a sufficient supply to run the large mill and concentrators will ere long be found in the mine. Col. H. A. Bigelow, a mining man of large experience, holds a position at the mine.

ITEMS.—Fred Sattes has leased his mine in Crook canyon. Weckler & Snapp are going to increase shipment of ore from White Spar mine. Messrs. Riggs, Lawler, Howell and others say the Hillside is richer than ever. Frank Alters saw some fine ledges east of the Agua Fria. W. W. Davis brought some fine specimens of ore from the Poverty mine, consisting of iron and copper pyrites, assaying $75. He also took 6700 pounds of ore to the sampling works for shipment to Pueblo. The opening of the Poverty mine is astonishingly rich in its showing. The tunnel reaches over 100 feet in depth, and the raise to the face is 65 feet and exhibits a pay-streak of ore from one to three feet through.

CONGRESS.—The mine is producing about 180 tons of gold ore per month. The richest sulphurets are sent to the smelters; others piled up to be milled and concentrated. Looks as if the Congress is the boss gold mine of the world. It has paid expenses of opening, procuring mill, erecting, etc., has thousands of tons of ore in reserve, and, it is said, paid several dividends.

MIDDLETON.—Upwards of 20 tons of ore from Robeson & Foster's Middleton mine are undergoing sampling. Ore carries sufficient quantities of gold and silver to pay well for mining, hauling to Prescott in wagons, sampling, shipping to Colorado, treating, and enough left to keep the owners from suffering for want of anything.

WAR EAGLE.—John McKinnon and D. W. Strahan, owners of the Gladiator mine on the War Eagle lode, have eight feet of ore that assays from $40 to $60 per ton, gold. Mine is opened to a depth of 110 feet by shaft. There is a tunnel 120 feet in length.

DIXIE.—The Dixie mill, Walker district, is running and, we hear, making money for its runners. Attached to it are some concentrators. Ben Rybon, who came in from there a day or two ago, said the plates were well plastered with gold.

BIG BUG.—Very good ore is being hoisted out of the Boggs and Hackberry mines, Big Bug district. Frederick E. Murray is giving the work close attention, and appears to be pleased with both mines.

BRITISH COLUMBIA.

PROSPECTS.—Kamloops *Sentinel*, July 3: The mining prospects at Okanagan lake are reported to be good. Development work is being pushed forward rapidly, and every one interested anticipates good returns. On Siwash creek, on the north side of the lake, John McLellan & Co. have struck rich placer diggings. Three or four men in a few hours took out over $30. A rush has taken place, and on Monday last 25 or 30 claims were recorded.

COLORADO.

THE GOLD STRIKE AT EMPIRE.—Georgetown *Courier*, July 4: Less than one week after the Colorado Springs Co. commenced operations on the Hidden Treasure group on Lincoln Mt., Empire, they struck rich ore. Apparently a continuation of the same body supposed to have been worked out by Markey in '87. They have from a quarter to three-quarters of an inch of almost pure gold worth from $10 to $16 per ounce. The find is about 150 feet deep from surface and was struck in the shaft now being sunk 300 feet from the mouth of the tunnel level. Pauline Placer Co. last week began closing the head-gates of their reservoirs on Mill creek. Cause, short water supply this season. The Denver City, east extension of Lamartine, was last week deeded from W. S. Comer to Hanchett & Burns, the final payment having been made. The old Knickerbocker mill at Empire is running 12 stamps on ore from the Silver Mountain mine at North Empire. Horstmann M. Co. are employing a number of men on their Daily district mines. Assays of ore from one of their lodes made last week gave over 800 ounces silver. Lamartine shipped 100 tons of ore produced between June 18th and 30th. During the month of June 2650 sacks of ore were shipped—the largest by several hundreds of any previous month. The prospects are favorable for a very large shipment in July. The average output of the Stevens mine is 100 tons of ore per month, and the average net returns for the ore is about $45 per ton. Thirty men are employed, but when the raise is completed between the tunnel and the upper workings, which will take two or three months, the force of men and the output will probably be doubled.

DAKOTA.

BEAR GULCH TIN.—Deadwood *Pioneer*, July 3: Superintendent Jackson, of the Callanan group of tin claims at Bear Gulch, was interviewed by a *Pioneer* reporter. Working 12 men at present; developments are being pushed rapidly enough. A new shaft was started on the Pullman lode last week. This is now 20 feet deep and in ore from two feet below the surface to the bottom. The ledge is widening rapidly, and while not over 30 inches wide when first found, now shows all the six feet. On the Spearfish lode, a force is employed driving the open cut, 40 feet wide and now 100 feet deep. In this a 24-foot face of ore is shown. The Spearfish is about 300 feet lower than the Pullman.

KEYSTONE CHLORINATION WORKS.—Deadwood *Pioneer*, July 6: W. B. McPherson, of Keith's Chlorination works, in from Garden City last night, stated that the cleanup proposed for day before yesterday will be made to-day. The Harmony company yesterday leased the plant for 100 days, a time long enough to treat 1000 tons of ore, agreeing to pay a royalty of two dollars per ton for all ore treated. The chlorination company guarantees to save 80 per cent. Prof. Carpenter and others qualified to speak state that at least 95 per cent can be saved.

IDAHO.

THE GOLD HILL MINE.—*Statesman*, July 3: Thomas Mootry, one of the proprietors of the Gold Hill mine at Quartzburg, yesterday furnished some interesting facts regarding the present condition of the mine. The depth attained on that portion of the property now being worked, and which is known as the Pioneer lode, is 250 feet. Above this level there is 50 feet feet of stoping-ground in good ore, which is now being taken out and crushed at the rate of 40 tons per day. The company is working a force of 25 men in the mine and mill. Attached to the mill is a self-feeder which saves the labor of four men. Monthly disbursements at the mine for all expenses amount to $65,000 per month. Mr. Mootry, who knows the country thoroughly, having been engaged in quartz mining here during the past 25 years, is fully convinced that the range of mountains in which the Gold Hill mine is situated, contains numerous other lodes and veins, which could be developed into paying mines, equally as valuable as the Gold Hill.

GOING FOR DEPTH.—Wood River *Times*, July 3: One possibly great benefit is, it seems, to inure to us from the recent visit of Craig Chambers. After looking through the Idahoan, Mr. Chambers concluded to "go for depth," and therefore gave instructions to sink another 100 feet. The present depth of the mine being only 700 feet on the dip of the vein, this will give it a depth of 800 feet on the vein, or of somewhere between 400 and 600 feet, vertical; and it will open up quite a stretch of entirely new ground. If an ore body is found, it will be the making of this region.

WORK RESUMED ON THE TIP TOP.—Work was resumed this morning at the Tip Top mine by a force of five or six men. Ole Rorem is the superintendent. About 25 tons of ore will be extracted for a test run at the Deer creek mill, and if the result is satisfactory, or even only partly so, the force at work in the mine will be increased, and ore extracted in large quantities. The Tip Top, as every one here knows, is on the Gold Belt, not a great distance from the Camas No. 2.

LOWER CALIFORNIA.

THE ALAMO MINES.—San Diego *Union*, July 4: The International Co. has prospected 25 locations at Alamo, by sinking shafts, running drifts and opening cuts on each one from 20 to 50 feet, and at least can be called first-class prospects. Many would call them mines without further development, as the ore now on the dumps will testify to their value. There are at least 25 good paying properties in the camp; the veins running from one foot to ten feet in width, and every one, without exception, that showed good prospects on the surface has improved with depth and development. Among the most prominent mines might be mentioned the Scorpion, owned by McGrath & Antonia; the Texas and El Paso, owned by Owens & Bain; the Elsinore, owned by Elsinore parties; the Rainbow, owned by Frey, Jackson et al.; the Asbestos and others, owned by Huff, Agramonte et al.; the Telemico, Princessa, Ulysses, Cocinero, Spider, San David and others, owned by the International Co.; also the Aurora and Alamo, owned by Pedro, Lopez & Gonzales; the Tarantula, owned by McCarthy and the Torres Mining Co., with the different mines owned by Mr. Butler, and many others, too numerous to mention. There are several first-class prospects owned by Lucas & Blethen. The Elsinore is 48 feet deep and has 10 feet of solid pay ore; the Scorpion has from 2 to 7 feet; the Telemico from 3 to 6 feet; the Ulysses from 2 to 5 feet, and the Princessa from 2 to 4 feet. The Elsinore and Telemico are conceded to be the best in camp. When it can be said that every one of these mines will produce in paying quantities gold ore that will run from $20 to $100 per ton, some idea will be given to the mining public of the great value and importance of this new district. There are now in operation Butler's mill of five stamps, and the Torres mill of five stamps, with power for 15, the balance now on the way. The International Co. will soon have a plant of 20 tons daily capacity, with four concentrators; also two steam hoisting and pumping plants, and the company's agent is now on the road to San Francisco to purchase and ship them at once. The International Co. will also put in a sawmill to furnish mining timbers for all the mines. The townsite of Alamo is finely located, with water works nearly completed. Mr. Douglas runs a tri-weekly stage line from Ensenada, making the trip in 12 hours. F. T. Sutherland is superintendent of the International Co.'s mines, and will purchase all the mining machinery to be used by them. James Randall is superintendent at Ensenada, and will purchase for and manage the sawmills. Both of these gentlemen are in this city, and are en route for San Francisco, where they go in the interest of the International Co. The company is causing roads to be built to the mines, and are doing everything in their power to further the interests of the country. Owens & Bain of El Paso, Texas, will put up a mill in the near future.

MONTANA.

GRANITE MOUNTAIN.—Phillipsburg *Mail*, July 4: The output for the week ending July 4th was 54 bars of bullion, containing 85,419 ounces silver and 159 49 ounces gold. Last Wednesday the Granite Mountain M. Co. declared their regular monthly dividend of 50 cents a share and also an extra dividend of 25 cents, both of which are payable July 10th. This is virtually a dividend of $300,000 or 75 cents a share, and brings the total amount paid by this company to date up to $6,700,000 and $1,300,000 since January 1st last. This is a specimen of what the greatest silver mine in the world can do, and what's more, the great Granite can and will keep it up for years to come. If there is a mine in the world that can beat this showing, we would like to hear of it. They have but fairly got to work with their new milling plant at Rumsey, and when things get running down to a fine point (which Supt. Weir says is the case at present), the dividends will exceed the above, or at any rate keep up a regular 75-cent dividend, or $300,000 per month. This means a dividend of $3,600,000 a year, which on 400,000 shares gives an annual dividend of $9 per share. Truly, Montana has the champion silver mine of the world. The Granite Co. are in receipt of a new pump which has a working capacity of 1000 gallons per minute, and which will be placed on the 800-foot level.

ORO FINO DISTRICT.—A recent arrival from this district informs us that the work on all the mines is progressing most satisfactorily. On the Ruby and American claims a vast amount of surface work has been done, and at present they are timbering the shaft, and a contract has been let for sinking 50 feet further, when they expect to strike the vein. The shaft will be sunk about 200 feet before they crosscut. Timbers are being framed for the gallows-frame, and machinery will be on hand for the hoist as soon as needed. At the Mountain Lion, operations are going ahead with the usual good results. They have now attained a depth in the shaft of 200 feet, and are crosscutting to the vein. They are sinking in country rock. At a distance of about 700 feet in the tunnel on the Mountain Rat, all the men were obliged to discontinue work on account of bad air, and further operations will cease until an air-compressor is put to work, and this will be done as soon as possible. At the Champion, the ore body in the mine is increasing in width all the time as the work proceeds. Shipments are being made right along. The company still has $20,000 in the treasury to be used in the developing work.

NEW MEXICO.

HACHITA.—*Western Liberal*, July 5: W. K. Smith from Hachita reports that the camp is taking on a boom which bids fair to equal the San Pedro and Cerrillos camps in Santa Fe county. There are 27 men at work on the American mine—all there is room for. An air shaft is being put down, and as soon as connections are made, a number of more men will be put on. The more work that is done on this property, the more ore there is exposed. The vein as exposed varies from four to eight feet, and it is all shipped without sorting to the International smelter at El Paso. The Dugout, owned by Smith, has three men at work on it taking out galena which runs from 60 to 80 per cent lead and carries from 500 to 1100 ounces in silver. Bob Anderson has one of the best claims in camp, but has been obliged to stop work and put in a pump, as he could not handle the water with a whip.

GOLD. — Silver City *Enterprise*, July 6: J. R. Johnson was in from Fleming this week, displaying some gold specimens which for richness can hardly be surpassed by anything from the Pinos Altos district. One of the specimens came from the depth of 300 feet, and was literally full of free gold. The other specimen came from nearer the surface, the gold being of a coarser character. It would be strange if the Old Man turned into a gold mine, after producing marvelously rich silver ores in quantities. The Standard Company of Shakespeare, has contracted to deliver 20,000 tons of ore to the Humboldt Company, which will soon have its new mill in operation. The rolls have given place to the stamps. The rolls from which wonders were expected, wore out after crushing eight tons of ore, thus causing a long delay in operations.

OREGON.

BONANZA MILL. — Bedrock *Democrat*, July 3: Mr. James R. Ladd of the Bonanza mill is in the city and from him we learn that the outlook in his section is very flattering. He brought in 70 ounces of dust, the output of four days of the Bonanza on Haggard ore. This mine looks very promising. They have 300 tons of ore in sight which will mill $50 per ton. They have one foot of ore in the face of their drift giving a pan test of $300 per ton. He reports several discoveries in the Greenhorn mountains which look very flattering, the ledges being very large, and assays from 20 to 60 ounces in silver with a large percentage of gold. One peculiarity of this country, is the silver-bearing rock carrying so largely in gold.

UTAH.

PARK NOTES.—*Record*, July 6: Last Saturday evening Ezra Thompson, Wm. O'Connell, Dan MacDonald and F. H. White, after repeated efforts, obtained a lease for one year on the Nevada and Northland mining claims, owned by C. E. Street, Jos. Gorlinski, F. J. Lubeck, Peter Anderson and Andrew Lundin. This property adjoins the Woodside group and the Mayflower No. 7, and it is considered a property of great value because the fertile vein which lie in the adjacent ground undoubtedly runs through these two claims also. The leasers immediately put a force of men at work.

THE APEX JIGGERS.—Flindt & Varcoe, who are working the Apex dump under a lease, are making good headway with their jigs. As soon as they get a rock breaker, however, more effective work can be done. Their machinery is ample and ere long the dump will have been worked over. Already they have shipped about 30 tons of high-grade jiggings.

CONCERNING THE CRESCENT.—The Crescent's hoisting machinery is being thoroughly overhauled and the pumps put in working order, in consequence of which comparatively little ore is being taken out at present and the tramway is temporarily shut down. The concentrator is working only during the day now.

THE ALLIANCE PRODUCING.—A considerable number of miners have been at work at the Alliance mine—the old Sampson—for several weeks past and the result is that the ore bodies have been opened up sufficiently to justify the resumption of ore shipments. This morning shipping began.

ORE SHIPMENTS.—During the week the Crescent shipped 60,000 pounds of concentrates. For the week just ended the Mackintosh sampler received 440,840 pounds of Ontario ore; 272,830 of Daly; 109,870 of Woodside; and 36,120 of Mayflower No. 7 leasers' ore; total, 859,660 pounds.

THE starting up of the new Union concentrator is still delayed because of the non-arrival of piping to complete water connections. However, the delay is not expected to last through the coming week. Everything else about the concentrator is in readiness.

ABOUT THE WOODSIDE.—The usual force of men employed by the leasers is kept at work by the Woodside Mining Co. and the average shipments are made.

WASHINGTON TERRITORY.

CLE-ELUM.—Ellensburgh *Capital*, July 6: A good deal of assessment work is being done on the mines of the Upper Cle-Elum. The new road to Fish lake will be completed this season and will be of great advantage in getting to and from the mines of the Upper Cle-Elum. The new silver lead struck at Salmon La Sac is attracting attention. Some development work is being done. The Uncle Sam and Brother Jonathan mines in Iron Mountain district are looking well. They are among the largest iron deposits on the Pacific Coast. Prospectors are doing well all along the Upper Cle-Elum this season. They find the mountains free from snow, and they can get around with but little interruption. The coal mine at Easton is opening up in good shape and will be a producer this season.

MECHANICAL PROGRESS.

Melting Iron.

W. A. Jones, a correspondent of the *Practical Mechanic*, furnishes that paper with the following practical information on melting iron:

The true principle of economy in melting iron is to handle the cupola in such a manner as to get as near as possible the full benefit of the fuel consumed, and at the same time use no more than is sufficient to melt the iron bright and hot. The average foundryman knows very little of chemistry, and cares very little for theory. His calculations are based upon an actual experience, the result of years of observation.

He knows that under certain conditions he may look for and expect certain results, and upon these conditions there is so much dependent over which he has no control, that it is not surprising that there is not more rapid strides made in this direction. To more clearly illustrate this, we may state that one of our largest manufacturers of steel recently remarked that it was practically impossible to produce twice in succession the same grade of steel, and this, too, from the same materials, by the same workmen, and apparently under the same circumstances.

This is just as applicable to cast iron as it is to steel, with only this difference: that cast iron is not as finely-graded, is not subjected to the same degree of manipulation in the way of tempering, annealing, etc. In other words, it does not receive the attention, probably for the reason that it is not as essential that it should. There is little doubt but what, if the same care and attention were exercised, the same difficulties in its production would arise.

It does not take a chemist nor a philosopher to see at a glance that the chemical changes brought about in the fusing of either iron or steel are largely dependent on the conditions of the elements, and these, to a much greater extent than is generally supposed, affect the draft and the fuel, and thereby the product produced.

Melting iron does not consist of merely reducing the greatest number of pounds into liquid shape, with the smallest percentage of fuel, but in actually melting it—melting it hot enough so that the various brands used will be thoroughly mixed together, something that is impossible unless the iron is melted hot. Many an otherwise good casting has been condemned from the "Penny-wise and pound foolish" principle of economy in cutting down the fuel too close, resulting in the iron not being mixed as it should be, at times forming the hard streaks or spots found in pulley rims, and other light castings requiring a finish.

The loss of very few castings from failure to run, or what is just about as bad, being *cold short*, would more than pay the cost of enough additional fuel to change the whole heat, to say nothing of the condition of the cupola and ladles in the morning.

When iron is not properly melted, it is impossible to produce good, sound, clean castings, no matter how much care is exercised in the construction of the mold or in pouring it.

Some time since a well-known writer on foundry practice made the statement in connection with clean castings, "that melted iron was pure," thus inferring that if the casting was not clean, the impurities came either from the mold or the ladle. This is a mistake, one, too, that is liable is mislead, as in fact it did mislead the writer. Melted iron contains many impurities, and the hotter it comes from the cupola the more readily these impurities can be separated and removed. The hotter the iron is in the ladle, the greater the agitation will be, and the more it is agitated, the more the impurities are thrown off. If melted iron was pure, there would be no occasion to use flux of any kind in the ladle. Graphite or black lead is found in many of our best brands of soft iron, but usually not in sufficient quantities to do any material damage when the iron is melted hot, but its presence is always more apparent in dull iron, and is, therefore, more noticeable in the first and last of the heat.

The art of mixing and melting iron is one to which there is practically no limit, and is well worth the consideration of progressive foundrymen.

There never was a time in the history of iron interests in which so many experiments have been put forth as at the present time, and it is conceded by many that we are on the eve of a complete revolution, in which the foundry will play no unimportant part. The development of steel and wrought-iron castings, the introduction of the Robert process, which bids fair to make it possible to produce any quality of steel or iron from the same converter, and at a very material decrease in cost, must eventually supersede the famous Bessemer process, while the introduction of aluminium in cast iron is still in its infancy.

ABRAHAM LINCOLN AND THE BLACKSMITHS.—More than one able man has started in life as a blacksmith, and many more able men have in their boyhood days been ambitious to put on the leather apron and learn the blacksmith's art. It is stated that Abraham Lincoln when he was a boy made up his mind at one time to learn the blacksmithing trade. Exactly why he did not carry out his intention we are not informed. His worth attracted attention afterward and he was nominated for the Legislature of Illinois. His maiden speech is worth preserving on account of its unpretentious character. It is as follows: "Gentlemen and fellow-citizens: I presume you all know who I am. I am humble Abraham Lincoln. I have been solicited by many friends to become a candidate for the Legislature. My politics are short and sweet. I am in favor of a national bank; I am in favor of the internal improvement system and a high protective tariff. These are my sentiments and political principles. If elected, I shall be thankful; if not, it will be all the same."

Steel as a Boiler Material.

The interesting topic of steel as a boiler material was discussed recently at a meeting of the South Staffordshire (English) Institute of Iron and Steel Managers, in the course of a debate on a paper read by Mr. G. H. Walkeden entitled "Notes on the Lancashire Boiler." Several instances were, by various speakers, adduced, wherein steel had proved by no means so satisfactory a material as had been anticipated.

"No steel in my boilers" had been the stipulation of one steam-user when paying £400 for a boiler 30 feet by 8 feet, so he had his boiler constructed completely of iron. Another example was given where another boiler user had had some of his boilers bottomed with steel plates, but in three months' time the steel plates had to be taken out and replaced by iron. Various explanations were offered of these occurrences by the champions of steel, who were by no means few. Bad feed-water was adduced as one probable cause of the preference shown by some steam-users in the Midland district for iron over steel, bearing in mind the higher susceptibility to corrosion shown by the latter metal and the notoriously bad quality of the water in the canals of Staffordshire and Warwickshire.

Corrosion due to electrolytic action was another suggestion which received favor from the meeting, and which perhaps boiler-makers and boiler-users do not generally at present take into account as much as they well might do. W. A. E. Tucker, metallurgist, of Smethwick, near Birmingham, said he knew of cases in that district in which boiler explosions had been clearly attributable to electrolytic action, set up by the combination of iron and steel in the construction of the boiler, and by the presence of brass fitting. This action had been sometimes set up by the use of tie rods of manganese bronze and phosphor bronze and similar materials. The intention had been to prevent corrosion, but the effect was just the reverse, for the electrolytic action was very marked at both ends of the tie rods, as the steel plates were correspondingly corroded at those particular points. While the subject is of course by no means a new one, it is of additional importance at a time like the present when the qualities of iron and steel for constructive purposes, both separately and in conjunction, were never more eagerly canvassed.

THE SMOKE NUISANCE.—We hear a great deal said about the "smoke nuisance," and various devices have been presented in the way of "smoke consumers" and other inventions for overcoming the evil; but most of these devices have proved miserable failures. The trouble has been that the inventors and other people interested in this subject have gone to work in the wrong way—have followed out wrong theories, and have subjected themselves to a great expense in order to get rid of the smoke after it was generated. This problem will probably remain unsolved until this theory is abandonded and the public have become thoroughly educated in another direction, and that is, to prevent the generation of smoke in the furnace, which, it has been thoroughly demonstrated, is the surest, if not the only way of entirely abolishing the "smoke nuisance."

ECONOMY OF FUEL GAS.—The opposition to the use of fuel gas for manufacturing purposes does not appear to be founded upon a fair business basis of merits, but seemingly originates in a fear of healthful competition and its success over other combustibles used with the same object. On this subject we have the most conclusive testimony from high authority, where it has been employed, and when the most complete details have been kept that the average saving over the use of coal is more than 30 per cent. The executive head of the Philadelphia Saw Works, Mr. Hamilton Disston, states that in the process of annealing, alone, the advantage gained from the introduction of the gas has rendered the latter invaluable. In the business circles of the world the word of Hamilton Disston is good.

COPPERING IRON.—Iron can be coppered by dipping it into melted copper, the surface of which is protected by a melted layer of cryolite and phosphoric acid, the articles to be thus treated being heated to the same temperature as the melted copper. Another process consists in dipping the article into a melted mixture of one part of chloride or fluoride of copper, five or six parts of cryelite and a little chloride of barium. If the article, when immersed, is connected with the negative pole of a battery, the process is hastened.

A STEEL suspension bridge is now being put up at Azusa, Los Angeles county. It crosses the San Gabriel river, and has a span of 200 feet.

SCIENTIFIC PROGRESS.

What Shall We Call It?

There is need of a new word or phrase that shall be distinctly expressive of modern progress. The expression, "this age of steam and electricity," has become stale and hackneyed. For all practical purposes of description it is at least half a century behind the times and should be retired with the phrase it superseded, "the age of canals and stage coaches." The flying carpet and magic mirror of the Arabian tales were realized, Dr. Holmes says, in the modern railroad coach and photographic camera; but the wonderful advances since these inventions find no prototypes in even oriental imagination and almost distance the wild dreams of theosophy. Here, for instance, is Mr. Edison, the magician of Menlo Park, working on a "far-sight machine," by means of which, he predicts, "one person can distinguish the face of a friend 500 miles distant." Next comes a learned scientist from the university of Pennsylvania, like another Dr. Faust from his diabolical laboratory, with mechanical contrivances which, it is claimed, "measure the time in hundreths of a second which is required to see the different colors, and they let you know exactly how long it takes you to smell a rose that is just under your nose, to taste a beefsteak that is in your mouth, to feel a thing that is under your hand, or hear a street band that has begun to play."

And stranger still, an Italian, who seems to combine the qualities of a mechanician, metaphysician and magician all in one, has constructed a machine which "registers in pounds and ounces the amount of brain-power expended in mental effort, and tells you just how much a dream weighs or how many pounds of brain cells you consumed in reading a book, or writing a poem, or listening to a sermon." These are clearly in the line of patent senses that shall do for the nose, taste, sensation, and even the natural functions of the intellect what the telescope does for the eye and the telephone for the ear. Will the coming man smell with a Lick nosescope and think with a Zalinski dynamite thinker, or something of that sort? To call the era which gives us these wonders of mechanical invention, this artificial expansion of pia mater and production of brain-power by machinery "the age of steam and electricity" is absurd.—*Cincinnati Times Star.*

DISCOVERING SPRINGS.—For ages many absurd fables were believed with respect to the best method of discovering springs, and even now the divining rod has not lost its partisans. There are, however, indications which may lead to the discovery of springs in cases where nothing would appear to those unaccustomed to observations of natural phenomena to induce a belief in their existence. The following are some of the more simple. In the early part of the year, if the grass assumes a brighter color in one particular part of a field than in the remainder, or, when the latter is plowed, if a part be darker than the rest, it may be suspected that water lies beneath it. In summer, the gnats hover in a column, and remain always at a certain hight above the ground over the spot where springs are concealed. In all seasons of the year denser vapors arise from those portions of the ground which, owing to the existence of subterranean springs, are more damp, especially in the morning or the evening. The springs to which these rules apply are such as are near the surface; when the source is lower the only safe guide is a bore, but to work this with success a certain knowledge of elementary geology is absolutely necessary.

ELECTRICITY AND LIGHT.—Dr. Moser (Eder's Jahrbuch fur Photographie) draws attention to the following curious phenomena: The leaves of an electroscope are caused to diverge by charging with, say, 150 cells. On allowing a ray of direct sunlight to fall on the instrument the divergence is increased, and it returns to its original amount when the light is cut off. A common match (sulphur with phosphorus tip) will glow in the dark when brought close to a charged body, such as the cover of an electrophorus. The mercury in a capillary electrometer falls when a ray of sunshine falls on it, just as it does when connected to the zinc of a battery. The effect is distinctly electrical, not thermal, as it vanishes when the upper and lower mercury columns are short circuited by a wire.

SOME RECENT BIOLOGICAL DISCOVERIES.—A most interesting lecture on this subject was delivered on May 21st before the British Royal Institution, by Prof. E. R. Lankester, in which he described at some length the studies made on the white corpuscles of the blood, their function, and the way in which it has been found possible to "educate" them in their fight with certain forms of disease. Twenty years ago very little was known about the white corpuscles beyond the fact that they were always found present in blood. Physiologists supposed they must have some function, but they were quite at a loss to guess even what it was. It was gradually recognized that there was a close resemblance, even to their movements, between them and the well known fresh-water amœba, so that they came to be called amœbiform bodies. It was the work of the Russian physiologist, Elias Metschnikow, that showed they were really the scavengers of the blood, that they eat up what is not wanted (whence he called them phagocytes) and by their motion in the blood often transfer it to where it is wanted. In all parts of the animal kingdom he had examined, he found their function the same. It is by their action the tadpole loses its tail, and it is by their rush to "eat up" the damaged part of cell structure that there is a formation of white pus. Metschnikow wished to know how they behaved with regard to the bacilli of diseases. He, therefore, took the transparent fresh-water daphnea pulex and introduced bacilli. With the aid of the microscope he found it was the case of a fight whether the phagocytes could eat up the bacilli fast enough, or whether they would attack the mat all. Phagocytes act as if they had real conscious likes and dislikes. They strongly, for example, dislike sulphate of iron, and shrink from it. But if their only food be placed beyond a streak of it they will pass over it, and in time their objection seems lost. The lecturer expressed his strong belief that corpuscles can in many ways be "educated." Some bacilli seem too powerful for them, but if the bacilli are cultivated, and their powerful poison action is weakened by this process, the phagocytes can "tackle" the weaker forms, and by degrees get trained to be able to face the strong. It is here we get the explanation of the effects of innoculation with "attenuated virus."—*Ex.*

THE "DESERT" OF SAHARA.—The Sahara, as a whole, is not below sea level; it is not the dry bed of a recent ocean, and it is not as flat as the proverbial pancake all over. Part of it, indeed, is very mountainous, and all of it is more or less varied in level. The Upper Sahara consists of a rocky plateau, rising at times into considerable peaks; the Lower, to which it descends by a steep slope, is "a vast depression of clay and sand," but still for the most part standing high above sea level. No portion of the Upper Sahara is less than 1300 feet high. Most of the lower reaches from 200 to 300 feet. The two spots below sea level consist of the beds of ancient lakes, now much shrunk by evaporation, owing to the present rainless condition of the country; the soil around these is deep in gypsum, and the water itself is considerably salter than the sea. That, however, is always the case with fresh-water lakes in their last dotage, as American geologists have amply proved in the case of the great Salt lake of Utah. Moving sand undoubtedly covers a large space in both divisions of the desert, but according to Sir Lambert Playfair, our best modern authority on the subject, it occupies not more than one-third part of the entire Algerian Sahara. Elsewhere rock, clay and muddy lake are the prevailing features, interspersed with no infrequent date groves and villages, the product of artesian wells, or excavted spaces, or river oases. Even Sahara, in short, to give it its due, is not by any means so black as it's painted.—*Cornhill Magazine.*

THE MANUFACTURE OF CELLULOID is to be investigated by the French Government with a view to lessening the danger to property and life which attends the making of that inflammable material. During the past two years three celluloid factories in France have been burned, without counting the preparation works at St. Denis. Each of these fires was also attended by loss of life, and in a recent instance at Paris, where a celluloid button factory was destroyed, two persons were killed and three seriously injured. It is thought that the French authorities will probably prohibit the manufacture of celluloid within a certain and considerable distance of inhabited houses. There can be no question as to the propriety of such regulations. The process of making celluloid, which is composed in great part of gun cotton, is too dangerous to be permitted in settled neighborhoods, and such establishments should be isolated. The worst of it is that the proprietors of these works, despite the many warnings which they have had and the property and lives sacrificed by explosions and fires in their works, carelessly go on assuring the public that there is no danger. The terrible explosion about two years ago over in New Jersey settled that question pretty thoroughly in the minds of people in that part of the country.—*Ex.*

SKULL DEVELOPMENT.—By comparing modern skulls with those of the same race in an old monastery in the Kedron valley, Mr. Dight of the American college of Berut, Syria, has shown that 13 centuries have added two inches to the circumference and the 3½ cubic inches in the capacity of the Caucasian skull. The brain has developed in the parts presiding over the moral and intellectual functions growing higher and longer, without increase of the lower portions, which give breadth to the head, and in which the selfish propensities are centered.

SCIENTIFIC USE OF THE EIFFEL TOWER.—One of the scientific uses of the Eiffel tower will be to weigh the moon. The method by which this rather startling purpose is to be accomplished is explained, along with the other marvellous capacities of that mammoth aspiration of iron, by Camille Flammarion, president of the French Astronomical Society, in the July number of the *Cosmopolitan*, with a number of striking illustrations.

ATMOSPHERIC SATURATION.—The invention of a "fog machine," by which water is thrown in spray as fine as vapor, makes it possible to spin the finest cotton thread in mills established in the hottest, dryest parts of the South.

GOOD HEALTH.

The Natural Diet.

The food which is most enjoyed is the diet we call bread and fruit. In all my long medical career, extending over 40 years, I have rarely known an instance in which a child has not preferred fruit to animal food. I have many times been called upon to treat children for stomachic disorders, induced by pressing upon them animal to the exclusion of fruit diet, and have seen the best results occur from the practice of reverting to the use of fruit in the dietary.

I say it without the least prejudice, as a lesson learned from simple experience, that the most natural diet for the young, after the natural milk diet, is fruit and whole-meal bread, with milk and water for drink. The desire for this same mode of sustenance is often continued into after years, as if the resort to flesh were a forced and artificial feeding, which required long and persistent habit to establish its permanency as a part of the system of every day life.

How strongly this preference taste for fruit over animal food prevails is shown by the simple fact of the retention of these foods in the mouth. Fruit is retained to be tasted and relished. Animal food, to use a common phrase, is "bolted." There is a natural desire to retain the delicious fruit for full mastication; there is no such desire, except in the trained gourmand, for the retention of animal substance.

One further fact which I have observed—and that too often to discard it as a fact of great moment—is that when a person of mature years has, for a time, given up voluntarily the use of animal food in favor of vegetable, the sense of repugnance to animal food is soon so markedly developed that a return to it is overcome with the utmost difficulty. Neither is this a mere fancy or fad peculiar to sensitive men or oversentimental women. I have been surprised to see it manifested in men who were the very reverse of sentimental, and who were, in fact, quite ashamed to admit themselves guilty of any such weakness. I have heard those who, gone over from a mixed diet of animal and vegetable food to pure vegetable diet, speak of feeling low under the new system, and declare that they must needs give it up in consequence; but I have found even these (without exception) declare that they infinitely preferred the simpler, purer, and, as it seemed to them, more natural food, plucked from the prime source of food, untainted by its passage through another animal body.—*Longman's Magazine.*

THE WASHINGTON EAR.—There is a disease said to be caused by asphalt dust, which is somewhat graphically referred to by a Washington correspondent of the St. Louis *Globe* as follows: With the march of modern improvements and the growth of luxury, diseases and their names increase, and humanity suffers from a score of polyesyllabic ailments now that our grandfathers never heard of. The latest is the "Washington ear," and such a name is a provocation to all the jokers and scoffers who knew what extraordinary things the Washington ear does manage to gather in, and the Washington tongue thereafter spreads. A friend of mine was taken with a sudden and frightful pain in the ear after a long drive on a windy day in an open carriage. Mindful of Roscoe Conkling's sufferings and untimely end, she sent at once for the best aurist in the city, and, after the first look, he said: "Oh, it is nothing but the Washington ear. It is an inflammation caused by the dust from these asphalt pavements. The dust is very poisonous to the ear, and I have innumerable cases of it. One or two patients who have obstinately refused to wear cotton in their ears on windy and dusty days, have lost their ear-drums by following inflammations."

ABOUT COLOR BLINDNESS.—Mr. Hughes relates that while acting as assistant engineer on the Granton railway he frequently returned on one of the engines from Granton to Edinburgh. On these occasions he observed that, although his undivided attention was directed toward the signal lamps, the lights of which were visible to him a long way off, he could not, till he was close to them, tell whether they were red or green. These are the two colors most commonly confused, but happily, they are visible to the majority of color blind persons when strongly illuminated. Railway guards, therefore, are less liable to mistakes by night than by day. Inability to discern any colors at all is very rare, and, in fact, has never been satisfactorily proved. A color blind person may have as good a sight in other ways as anybody else. The defect is not occasioned by any disease in the eye, but seems to have its origin in the brain. A red-green blind person sees only two colors on the spectrum; all the colors on the side of the red (warm colors) are confused together, and all on the side of the violet (cold colors), but the warm and the cold are never confused. Yellow is the one color which is always distinguishable. It is a curious fact that color blindness is often associated with a corresponding inability to distinguish musical sounds.—*Medical Register.*

TO CURE CRAMP.—A physician says: When I have a patient who is subject to cramp, I always advise him to provide himself with a strong cord. A long garter will do if nothing else is handy. When the cramp comes on take the cord, wind it around the leg over the place that is cramped, and take an end in each hand and give it a sharp pull, one that will hurt a little. Instantly the cramp will cease, and the sufferer can go to bed assured it will not come on again that night.

TO INSURE HEALTH, so far as human effort can control the matter, one should above all be cheerful, contented, and calm. Be cheerful, do not brood over fond hopes unrealized until a chain, link after link, is fastened on each thought and wound around the heart. Nature intended you to be the fountain-spring of cheerfulness and social life, and not the traveling monument of despair and melancholy.

TUBERCULOSIS FROM EARRINGS.—Dr. Von Duhring has reported a case in which tuberculosis was transmitted by the earrings of a girl who died of consumption to another girl. Shortly after the second girl commenced to wear the earrings, an ulcer containing tubercle bacilli formed on her left ear and she subsequently developed pulmonary consumption.

TO PREVENT SEASICKNESS —Some one who who claims to have tried it, says that seasickness can be regulated by a system of breathing. One must sit still and time the breathing to the upward and downward motion of the boat. As the boat falls, there should be a full expiration, and as the boat rises, start on an inspiration, ending just as the boat begins to drop.

NARROW-CHESTED RECRUITS of the Prussian army are to be measured monthly, and those whose chests are not widened by drill are to be discharged as predisposed to consumption. All are to be considered narrow-chested whose chests are less in circumference than half the length of their bodies.

CALAMUS IN HICCOUGHING.—Sweet flag (calamus) is claimed by Dr. Haigh of Granda, Kan., to be an agent that will relieve and stop persistent hiccough in almost any case. He directs the patient to chew a small piece of the root. It has never failed in his hands.

USEFUL INFORMATION.

EVOLUTION OF NATURAL GAS.—The first recorded discovery of a natural gas-well in the United States resulted from borings made within the limits of the present city of Charleston, S. C., in 1815, but in this case the gas does not appear to have been put to any use. In 1821 natural gas was discovered issuing from a spring at Fredonia, N. Y. This discovery was made by a woman who had gone to the spring one dark night to draw some water in a pail. In order to aid her in doing this, she put down a lantern, when the gas which was rising from the spring, took fire. This alarmed the woman, who hastily dropping both pail and lantern, ran back to her home as fast as possible. This gas was first collected by excavating and covering the spring. It was then conveyed into a small holder made of copper, and from thence to one mill and several stores where it was used for light. This was the first practical use of natural gas in the United States. When Lafayette passed through the village in 1824 the hotel called the Taylor house was illumined with this gas in honor of this distinguished man. The well is said to be producing yet, and Fredonia is still lighted by natural gas.—*Engineering and Mining Journal.*

A CORRECT ANSWER.—A scientific paper recently offered a reward for the most correct answers to certain scientific problems. Among others was the old scientific "conundrum," which weighs the most, a pound of feathers or a pound of lead? Of course a pound is a pound, no matter of what substance, and when the simple or thoughtless person answers that a pound of lead is the heaviest, everybody laughs. Mr. Charles Plitt, in answering this question, claims that the lead would weigh the heaviest, because the feathers would be buoyed up by a weight equal to the amount of air which they displace—just as a cork is buoyed up in the water. In future, therefore, we must refrain from laughing at the fool's answer, as practically it is correct. Of course, if weighed in a vacuum, a pound of any two substances would weigh alike.

THE STICK OF WOOD IN THE BARREL.—A correspondent of the *Practical Mechanic* writes that he has tried the experiment which has been written about in the press of late, of inserting a stick of wood in a barrel or hogshead of water to prevent its bursting when frozen, and has found it an effective remedy. He says he had no faith in the success of the experiment, but decided to risk one barrel, so inserted a stick about 4x3 inches and let the barrel freeze up solid, and much to his surprise the barrel was uninjured, the ice bulging up around the stick, but not a stave or section of the head started. This is a valuable thing for all to remember.

KILLING A TRUST.—The pine-straw industry, backed by Southern capital, is the answer which will be made to the jute trust this year. The pine bagging patents are owned by five men, who purpose to have ready for the fall cotton crop five factories that will make 10,000,000 yards of bagging. It takes about 55,000,000 yards of bagging to cover 7,000,000 bales of cotton. That means 28 factories, which at present estimates would cost $5,600,000, or about 80 cents a bale, permanently invested in factories. The five factories they will undertake to build this season will put things in decidedly better shape than they were last year. The farmers are not out of the woods yet, but they can see the light breaking through the pine trees.—*Atlanta (Ga.) Dispatch.*

A NEW NON MAGNETIC ALLOY.—A new alloy has recently been brought out in Geneva, Switzerland, by Messrs. Ostermann and Lacroix, to be used as a substitute for steel in the manufacture of different parts of watch mechanism, such as, for example, hair springs and balance wheels, which are apt to cause a good deal of annoyance through becoming magnetized. We need, therefore, perhaps scarcely say the alloy is claimed to be non-magnetic. It is made up from 30 to 40 parts of gold, from 30 to 40 parts of palladium, .1 to 5 parts of rhodium, 10 to 20 parts of copper, .1 to 5 parts of manganese, and the same proportion of silver and of platinum. The copper and manganese are first mixed, after which the other metals are added, or all the metals may be put into a crucible at the same time, the manganese being used for the bottom layer.

DEPOSITS OF WAGE WORKERS.—The wage workers of the country possess a power of which they know but little at this time, which can come only by a slow, steady accumulation of surplus earnings. In all our larger cities throughout the North the wage workers are the heaviest depositors. It is their money, under the control of able men, that moves the wheels of trade and commerce. In Boston the deposits of the wage workers run into the millions. Throughout the manufacturing towns of New England and the Middle States there are tens of thousands and millions invested by the wage workers which bring them returns ranging from three to six per cent. Philadelphia has its banks filled with money from the pockets of its 300,000 wage workers, and Pittsburgh has $25,000,000 in its banks, placed there by the toilers in mills and factories.

EDISON STILL AT WORK.—"I am at work at present upon no less than seventy distinct inventions," said Mr. Edison. "One of the most peculiar and which promises good results is what I may call a far-sight machine. By means of this I hope to be able to increase the range of vision by hundreds of miles so that a man in New York could see the features of his friends in Boston with as much ease as he could see a performance upon the stage. That would be one invention worthy of a prominent place in the World's Fair, and I hope to have it perfected long before 1892. But that is not all. I can safely promise many inprovements in electric inventions of many kinds which will interest and instruct visitors from all portions of the world."

MOON AND FLOODS.—Grandfather Smith of Punkeutawney, Pa., who was gathered to his fathers several years ago, used to say, after the great flood of 1861, that it was all in the moon. "Whenever," he said, "the moon changes at 11 o'clock and 59 minutes in the daytime on June 1st, you may look out for heavy rains and a big flood. I have seen two or three great floods during my lifetime, and they were all caused by the change of the moon at this particular time—11:59, June 1st. When the change of the moon comes again at that time, look out." Several of the citizens remembered this, and, looking up the almanac, found that the change of the moon took place on June 1, 1889, precisely at 11:59, and in consequence they marvel much.

THE LATEST STATISTICS of Krupp's establishment are supplied in a book just published at Essen. In 1833 it had nine workmen; in 1848, 74. In July, 1888, it employed 20,960 men, of whom 13,626 were at Essen, and including the families of the workmen, it supported a population of 73,769 souls, of whom 24,193 lived in the houses it provides. There are at Essen 1195 furnaces of various constructions, 286 boilers, 92 steam hammers, of from 100 to 50,000 kil., 370 steam engines, with a total of 27,000 horse-power, 1724 different machines, and 361 cranes. Of coal and coke 2735 tons are used daily, and 11 blast furnaces of the latest construction produce nearly 600 tons of iron per day.—*Engineering.*

GROWTH OF THE INDIA-RUBBER BUSINESS.—Dr. Priestly wrote in 1770 that he had seen "a substance excellently adapted to the purpose of wiping from paper the marks of a black lead-pencil." This was india-rubber in cakes half an inch square, which were sold at 75 cents each. Rubber is now made into tires and springs for wagons, jewelry, combs, knife handles, boxes, dishes, coats, tents, shoes, buckets, and hundreds of other articles. In this country we import annually about 14,000,000 pounds of crude rubber at a cost of about $10,000,000.

AMERICANS AHEAD BUT CARELESS.—Some one has said that "the Americans were born 20 minutes ahead of time, and are continually trying to gain another minute." Here is the cause of half the accidents that occur. The other half is caused by "don't care" and "it's none of my business," in equal proportions.

ELECTRICITY.

Progress of Electrical Applications.

No other scientific subject on earth has received greater attention during the last few years than electricity and the uses to which it may be applied; and yet its development from an industrial standpoint is but in its infancy. It is used to lend vitality and strength to the human system and to take human life. It is to-day the greatest commercial factor on earth, and is fast becoming indispensable in the household. Nations, states and cities are by it brought into direct verbal communication.

According to creditable reports there are at this writing 3351 isolated electric lighting plants and central stations in the United States alone that are nightly operating 192,500 arc and 1,925,000 incandescent lights. There are 459,495 horse power of steam engines devoted to electric lighting. The capital invested in the electric lighting companies during the past half year has been increased to the extent of $42,210,100. In April last there were in this country 59 electric railways, with 309 miles of track, operating 440 motor cars, and utilizing about 8000 horse power for stationary engines. Forty-nine new roads were in February last being built, having a total of 189 miles of track and to use 244 motor cars. There are also several motor factories, some of them employing as many as 1200 men.

In medical treatment nothing has shown more marked advance than the application of electricity. The galvanic battery is in some degree taking the place of surgery and offering a mild or at least unterrifying procedure in place of the knife. For some painful diseases peculiar to woman this—in the hands of a skillful and experienced physician—benign agency has been proved of high remedial virtue. Apostoli, Engelmann, Hutchinson, Cook, have obtained results of surprising efficacy in cases where the physician had pronounced a radical operation of doubtful value.

The use of electricity for conveying power from central stations in cities to small shops, factories, printing offices, etc., is of inestimable value, and its use for such purposes is rapidly increasing. For conveying power from inaccessible or inconvenient water-power centers, it is coming largely into use.

Its introduction for welding purposes has already proven of great importance, and is vastly enlarging the application of iron welding to many purposes for which it has hitherto been inapplicable.

Electricity has proven of especial value in welding copper.

The exclusive use of electricity on board ships-of-war for firing guns and for various other purposes seems to be only a question of time—and a very short time at that. The electrical appliances for these naval uses are being perfected with great rapidity.

A French electrician claims that he will soon be able to produce a thunder storm wherever and whenever desired.

What Edison has been able to accomplish by this agency is really wonderful; but what he promises to do in the near future is still more remarkable. The tremendous development of electrical science the world over is well illustrated at the Paris Exposition. There are 500 exhibitors of electrical apparatus. They come from 18 countries. Edison is there with his 500 inventions, and this is by far the most extensive exhibit made by any one person from any country represented.

It is a generally acknowledged fact that notwithstanding what has already been accomplished by the aid of electricity, that wonderful agency is still only in the infancy of its development.

WELDING BY ELECTRICITY.—The possibility of welding by electricity has been known longer than is generally supposed, Prof. Elihu Thomson having accidentally melted together wires of an induction coil some 11 years ago. This mishap was the germ of a process likely to find an almost infinite variety of applications, such as the welding of gold rings, steel axes, parts of locomotives, boiler plates, tubes, wire lines, lead pipes, etc. Among the advantages of electric welding are an absolutely pure heat (that is, a heat free from harmful gasses), absolute means of regulation, heating constantly before the eyes of the operator, a neatness to which ordinary methods cannot at all be compared, an increased economy of at least 300 per cent in most cases; absolute safety of handling apparatus, and portability of the apparatus for use in repairing, etc.

AN ELECTRICAL SUBSTITUTE FOR THE MARINERS' COMPASS.—The London *Electrician* prints a singular rumor to the effect that the use of the compass is about to be altogether superseded. A method is said to have been discovered by which the true north may at any moment be ascertained by means of a device which is wholly independent of magnetic action. The reading is, however, obtained by electrical means, and it is said that a well-known Berlin firm of electricians has secured the patents. The informant also surmises that gyroscopic action is also involved.

SAFETY IN ELECTRICITY.—There are 1300 buildings in Philadelphia supplied with electricity for light or power purposes, and in not one of these has there been any loss by fire for the past two years.

MINING AND SCIENTIFIC PRESS.

A. T. DEWEY. W. B. EWER.

DEWEY & CO., Publishers.

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W. B. EWER.....SENIOR EDITOR

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SAN FRANCISCO

Saturday, July 13, 1889.

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[NEW THIS ISSUE.]

Crawford English and Manual Training School, Oakland.

☞ *See Advertising Columns.*

Passing Events.

The destruction of the smelting furnaces of the Eureka Consolidated mine, at Eureka, Nev., entails a loss of about $250,000. The plant was a very fine one and its destruction by fire will seriously injure Eureka and its surroundings.

In the past few weeks several very disastrous fires have occurred on this coast. The flourishing town of Bakersfield, Kern county, is the last to have met with serious loss.

Fresno county seems to be coming to the front with productive quartz mines. The quartz interests of that county have only attracted attention of late years, but many fine ledges have been developed.

The shaft in the Idaho mine has been reopened and the bodies of the two miners imprisoned at the time of the fire recovered. The fire in the mine has been extinguished, but the extent of the damage has not been ascertained.

Money has been donated to purchase the largest photographic telescope ever made, and this, when completed, will be placed in position on one of the mountains in the southern part of this State.

THE ceremony of laying the corner-stone of the new Academy of Sciences building on Market street, near Fourth, took place this week too late for us to make more than a reference to it.

A Photographic Telescope.

Photography is rapidly changing the older methods of astronomical study. It gives an accurate representation of many objects at the same time; and, since copies may be easily made, it permits the results to be studied at leisure at any place and time. In a recent paper before the National Academy of Sciences, Prof. Edward C. Pickering of Harvard College Observatory recommended the construction of a large photographic telescope with a lens like that used by photographers, rather than like that of an astronomical telescope.

In November of last year this gentleman published a circular giving his ideas on the subject and making an appeal for the money necessary to make this instrument. In this circular he suggested that the photographic telescope should be placed on one of the mountains of the southern part of California, where climatic conditions especially favorable exist. He stated that it was proposed to establish in that section an astronomical observatory, and hoped to see the form of instrument suggested become a part of that observatory. He called attention to the fact that in California the interest in astronomy is widespread and the atmospheric conditions are excellent.

It seems that this appeal of Prof. Pickering has met with a ready response. The astronomical observatory of Harvard College has just received from Miss C. W. Bruce of New York a gift of $50,000, to be applied "to the construction of a photographic telescope having an objective of about 24 inches aperture, with a focal length of about 11 feet, and of the character described by the director in his circular of November last; also to secure its use under favorable climatic conditions in such a way as in his judgment will best advance astronomical science."

This will undoubtedly insure another large photographic telescope for California, this time under the management of Harvard College.

This instrument, Prof. Pickering states, will differ from other large telescopes in the construction of its object-glass, which will be a compound lens of the form used by photographers and known as a portrait lens. The focal length of such a lens is very small compared with its diameter, and much fainter stars can be photographed in consequence. The advantage is even greater in photographing nebulæ or other faint surfaces. Moreover, this form of lens will enable each photographic plate to cover an area several times as great as that which is covered by an instrument of the usual form.

With the 24-inch aperture each photograph will be 13 inches on a side and will cover a portion of the sky five degrees square, on a scale of one minute to a millimeter. The dimensions will be the same as those of the standard charts of Chacornac and Peters. The entire sky would be depicted upon about 2000 of such charts.

In Europe and in the eastern portions of the United States, where nine-tenths of the principal observatories of the world are situated, it is cloudy for a large portion of the year. Great advantages are expected from a location where clouds and haze are seldom seen. All the stars north of —30 degrees can be advantageously photographed in the latitude of Southern California. This region, covering three-quarters of the sky, has an area of 30,000 square degrees. There are 3600 hours of darkness in a year; and even allowing one-half for clouds and moonlight, and one-third of the remainder for imperfect plates, it would not take a very long time to do the whole work. By using a prism to cover the lens, the spectra of all the stars may be taken in the same way and at the same time. When this work is completed, it should be repeated, since we ought to have a complete map of the sky at intervals of about five or ten years to detect changes.

The faintest stars photographed with the eight-inch telescope at Cambridge are invisible with the 15-inch telescope. The inner satellites of Uranus have been photographed at Cambridge with a 13 inch lens, although they are among the most difficult test objects known. We may therefore expect that stars too faint to be detected with any other instrument might be photographed with the 24-inch lens. We thus see that any person could obtain at a comparatively small cost a map of a portion of the sky showing stars too faint for him to observe in any other way. Many investigations may be carried on by means of these plates; for instance, a search for double stars, for nebulæ, for asteriods, for variable stars by comparison of plates of the same region taken on different nights, for stars having large proper motion when we have the plates repeated after a considerable interval of time. In all these cases the plate furnishes an accurate measure of the object discovered. The number of the stars photographed on the chart would be vast. In some cases it is estimated that 20,000 or 30,000 stars have been photographed on a single plate

It is hoped that an endowment of $100,000 will be made, which will keep this instrument permanently at work. California now has the largest and most powerful astronomical telescope in the world, and this action gives it also the largest telescope to be used for solely photographic purposes.

Silver Facts and Figures.

NUMBER 3.

Turning from the favorable statistical position of silver the world over, to its low price and its depressing influence on wheat and cotton, it is surprisingly strange that no administration in this country has risen to the occasion to not only carry out the full text of the Act passed by Congress in 1878, requiring the minting of 4,000,000 standard dollars a month, but also to declare in favor of free coinage of silver.

View it in whatever light we may, still there is no denying that England is the true rival of the United States. It is the fear of this country assuming an aggressive commercial course that is ever uppermost in the British statesmen's thoughts, and to keep us from it, there is no doubt but the ruling class in England wish us to suspend the coinage of silver indefinitely. They know that such action would depress the price of silver still more, notwithstanding it would lessen in like proportion the sterling value of the rupee in the Indian Empire, and the rouble in Russia. But England generally continues to keep her ablest statesmen in the service of the Government, and their course gives color to the generally accepted belief that they never hesitate to sacrifice a small present advantage for a large future gain. This is one of the causes which has made England mistress of the seas—the greatest power in this respect that exists or that ever existed. Her statesmen are trained from their youth; they look out for British interests; they serve England with the same watchful devotion a faithful lawyer serves his client, and their fees are the grand honors and emoluments which England always bestows for recognized great services. With silver low, Great Britain sees her agricultural interests prostrated, her farm rents fade away, but she recognizes the fact that her enduring greatness does not depend upon farming, but on her commerce and manufactures.

As early as 1833 we began to boast that "cotton was king," and that England could not get along without our cotton. The ever-watchful statesmen of England began to see that there was peril in our boast, and Sir Robert Peel, while urging in the British Parliament the passage of an act (which was passed in 1833), appropriating twenty million pounds sterling to purchase the freedom of the slaves in the British colonies, did not affect any especial sentiment about the wrongs of slavery, but suggested that the freeing the negroes in the West Indies would finally dissolve the American Union. It is the history of that time that soon after the liberation of the slaves, the reproach of "American slavery" was rudely thrown into the face of every American traveling abroad, until the North want to war to preserve the Union, when forthwith the ruling class in England, with scarcely an exception, took sides with the slaveholder, and confidently expected, and by their action gave expression to an ardent desire for, a dissolution of the Union.

In 1879 the export of wheat from this country was 153,000,000 bushels, while the export from India for the same year was only about 4,000,000 bushels. Seven years after, in 1886, the exports from the United States had fallen to 57,000,000 bushels, and the export from India had risen to 39,000,000. Not only had our exports of wheat lessened but the price at the Atlantic seaboard had fallen from an average of $1.24 a bushel the first half of the year of 1879 to an average of 84 cents the first half of the year 1886. Upon these facts, taken from the bureau of statistics, there is no necessity for comments. The price of American wheat has also been directly depressed by contraction of the actual circulation of the currency. In the report of our Silver Commission, made in 1877, ex-Governor Boutwell, at one time United States Secretary of Treasury (Vol. 1, page 138,) says: "It is no doubt true that the demonetization of either metal adds to the purchasing power of the metal retained for use, by diminishing the price of every article of merchandise, while it increases the burden of debts, both public and private." This assertion is carried out in the inquiry of the Royal Commission, which showed that the "index number" representing the combined prices of 22 leading commodities in England was at the close of 1872, 2947, and at the close of 1886, 2059. This shows a great falling off in prices since the United States in 1873 joined the kingly raid against silver.

Soon after we had banished the silver dollar from coinage by the Act of Feb. 12, 1873, and made the gold dollar the unit of value, England abolished the export duty on wheat from India. England with all her dependencies produces no silver worth considering, but her gold interests in Australia are vast, with her African possessions coming to the front as large producers. All her legislation in the direction of the precious metals has been aimed to enhance the value of gold and degrade that of silver. By act of Parliament, silver, as standard coin, is banished from the realm, and by Acts VII and VIII Victoria, chapter 32, the Bank of England is compelled to purchase all gold bullion of 22 carats fine at £3 17s. 9d. per ounce, however much may be offered.

At a meeting of the British and Colonial Chamber of Commerce, held in London in June, 1885, Sir Robert Fowler, Member of Parliament and ex-Lord Mayor of England, is reported to have said "that the effect of the depreciation of silver must finally be the ruin of the wheat and cotton industries of America, and be the development of India as the chief wheat and cotton exporter of the world."

Until the United States in 1873 joined the crusade against silver the average value of the bullion in the London market—for long years—was over 60d. an ounce. In May, 1888, it fell at one time as low as 41⅛d., the lowest ever before known. The fall of silver and the export of Indian wheat and cotton incident to that fall, as the late Secretary of Treasury Manning justly said, has cost us millions on millions of dollars.

In the light of the above it is clear to all thinking minds that England is our rival, and hence it is time that we cease to expect her to join us with an earnest desire in any convention which will tend to an international agreement about silver. If we, with all our boundless resources, cannot construct a system of finance suited to our wants, but remain dependent on England, we may as well acknowledge that we are unequal to the responsibility which God and nature has laid upon us.

THE CALICO MINING SUIT.—In the United States Circuit Court at Los Angeles, on Monday, Judge Ross reinstated on the calender the sensational mining suit involving the property in Calico district of the Waterloo Mining Company against John S. Doe, Diedrich Bahten and James L. Patterson. The suit was dismissed July 2d by Judge Ross on a technicality. To-day A. H. Rickatts, attorney for the plaintiffs, appeared before the court and established the fact that the application for a dismissal had been improperly made under the rules, the time for filing plaintiff's replication not having expired. Judge Ross stopped the counsel in the midst of the argument, and stated that the position taken was correct and that the order dismissing the case should never have been made. The action is now restored to precisely the same footing as before. The suit is for $500,000 damages, the complaint alleging that Doe has jumped and illegally held the claim known as Oregon No. 3, claimed as the property of the plaintiff. Ten days were given to the plaintiffs to file a replication.

THE Omnibus R. R. Co. has commenced work on its Post-street branch, which will be a cable road. It will require $2,000,000 for the construction and equipment of the system of this company, all of which will be spent here among California manufacturers and laborers.

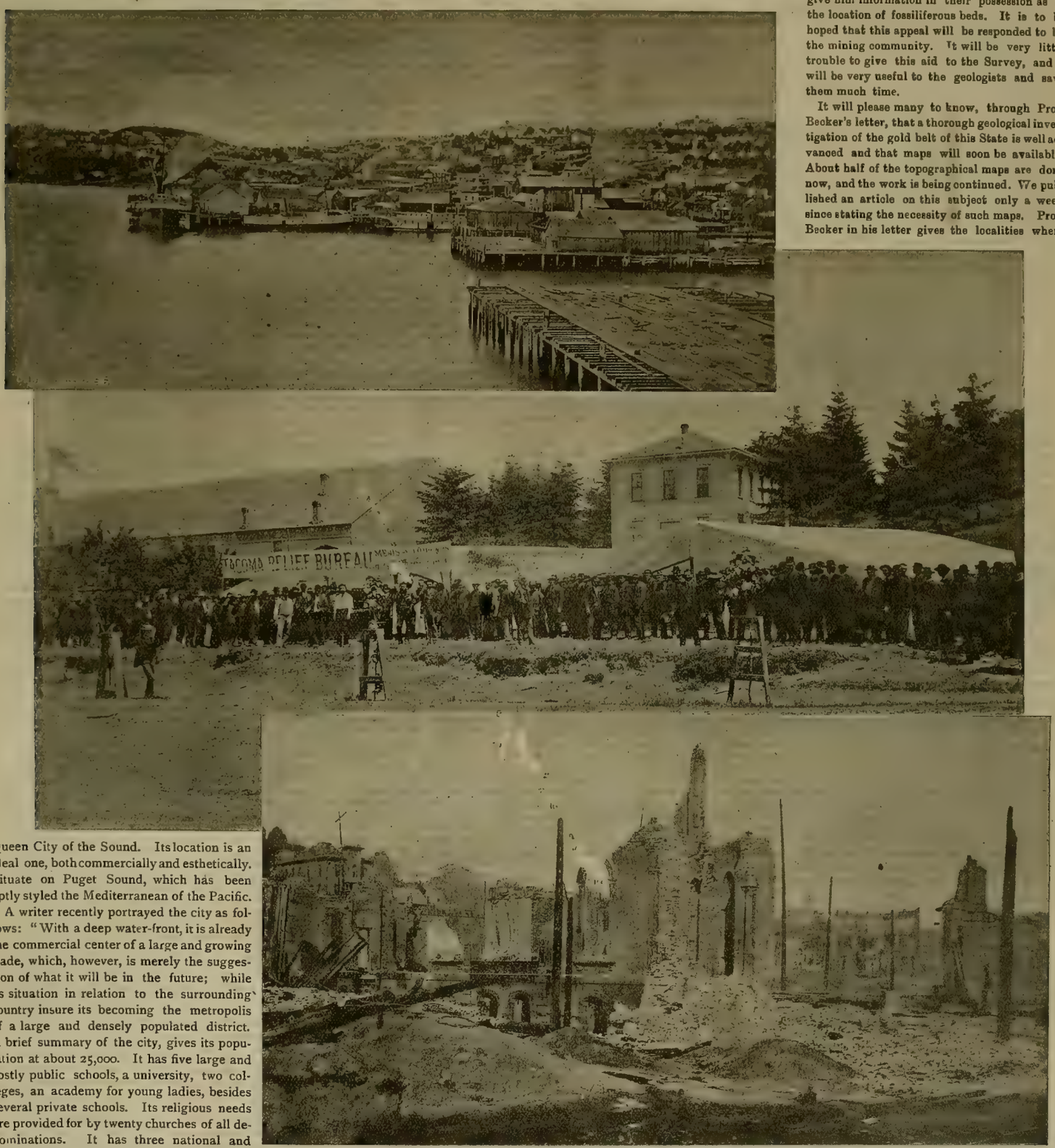
Seattle—Before and After the Fire.

We give on this page a series of views in connection with the late disastrous fire at Seattle, from original photographs by Boyd of that city. The first is a view of the city before it was visited by the recent calamity, which shows that it well deserves the title of Queen City of the Sound. Its location is an ideal one, both commercially and esthetically. Situate on Puget Sound, which has been aptly styled the Mediterranean of the Pacific.

A writer recently portrayed the city as follows: "With a deep water-front, it is already the commercial center of a large and growing trade, which, however, is merely the suggestion of what it will be in the future; while its situation in relation to the surrounding country insure its becoming the metropolis of a large and densely populated district. A brief summary of the city, gives its population at about 25,000. It has five large and costly public schools, a university, two colleges, an academy for young ladies, besides several private schools. Its religious needs are provided for by twenty churches of all denominations. It has three national and several private banks, three hospitals and an orphan's home. It supports four daily, and several weekly journals, and is a teeming hive of industry where all kinds and conditions of men may find congenial occupation.

Our second illustration is relief tents supplied by the people of Tacoma after the fire at Seattle, for the purpose of rendering aid for the sufferers. Their city is also favorably located on the Sound, and has sometimes been regarded as a rival of its more prosperous but unfortunate neighbor, whose enterprise and growth have been regarded at times with no little jealousy by the Tacomaites. This was all forgotten, however, in the overwhelming calamity which has befallen Seattle, and all envious thoughts of rivalry were obliterated by that sympathy for the unfortunate—that "touch of nature" which "makes the whole world kin" and is a redeeming feature in a generally selfish world.

Our third picture is of the ruins of the Puget Sound National bank in the Occidental hotel block after the fire had done its destructive work. This is but one of a number of similar views taken by the artist, showing the devastation left in the track of the devouring element. The better part of Chicago was wiped out by the upsetting of a coal-oil lamp. The igniting of a pot of glue involved the destruction of buildings covering an area of one hundred and thirty acres, and of the valuation of fifteen million dollars at Seattle. It is gratifying to know, that though the loss has been so severe, entailing absolute ruin to so many worthy and enterprising citizens, that the people of Seattle are already at work with characteristic American energy rebuilding the desolate places of their ruined city.



SCENES IN SEATTLE BEFORE AND AFTER THE GREAT FIRE

SAN DIEGO now talks of a smelting plant to cost $40,000. The *Sun* says: "It will be known as the San Diego Smelting and Refining Works. The erection of this smelter will bring to San Diego a large tonnage of ores from Altanta, Culican and West Mexico generally that now go to Swansea, Baltimore, San Francisco and elsewhere."

THE advance guard of the hydrographic surveying party, which will take a preliminary look at the watershed of the eastern slope of the Sierra, arrived in Carson last week.

THE trustees have authorized the immediate construction of the Lick free baths. The building is to be ready by Dec. 1st.

The California Gold Belt.

On page 22 of this number of the PRESS will be found a letter from Prof. Geo. F. Becker of the U. S. Geological Survey with regard to the location of fossils on the gold belt of this State. He asks that those in a position to do so wil forward to him such fossils as they may find or give him information in their possession as to the location of fossiliferous beds. It is to be hoped that this appeal will be responded to by the mining community. It will be very little trouble to give this aid to the Survey, and it will be very useful to the geologists and save them much time.

It will please many to know, through Prof. Becker's letter, that a thorough geological investigation of the gold belt of this State is well advanced and that maps will soon be available. About half of the topographical maps are done now, and the work is being continued. We published an article on this subject only a week since stating the necessity of such maps. Prof. Becker in his letter gives the localities where fossils have already been found, but doubtless there are many other places known to the residents but of which the geologists have no information. It is to be hoped that our cotemporaries in the mining regions will give further publicity to Prof. Becker's request, as it is a matter of public interest, and one which should be attended to.

QUICKSILVER.—The article on page 22 in this number of the PRESS, by Henry G. Hanks, has been copyrighted by the author. Mr. Hanks intends writing several articles on this subject, which will, in due time, appear in this paper.

Coast Fires.

The destruction by fire of the furnace of the Eureka Consolidated Mining Co., at Eureka, Nev., will seriously affect the mining interests of that section, although there has been a great deal of grumbling among the miners at the charges made by the smelters there for working custom ore. It was only last week that the local paper scored the managers of the smelting works at Eureka for combining to the detriment of the general interests of the camp.

We have been exceedingly unlucky on this coast of late in the matter of fires. Others quickly followed the disastrous conflagration at Seattle, though that was the worst that ever occurred this side of the Missouri river. At Vancouver, W. T., on the 22d ult. there was a large fire. Hailey, Idaho, has been almost destroyed. Then the town of Ellensburg, W. T., was swept by the flames which burned up 14 blocks of the business portion. Following this came an immense fire at Bakersfield, Kern Co., where 13 blocks were burned over, leaving the enterprising town a mass of smoking ruins. Then came the fire at Eureka, Nev., followed by the destruction of Fresno's Chinatown. The insurance companies are having hard luck, for these numerous losses, coming so soon after the great Seattle disaster, are severely felt.

In most of these cases the fire departments of the town were powerless to cope with the flames. In truth we are no better off in San Francisco than these smaller places in this respect. Our department is not on a metropolitan scale by any means, and will not be until we have a full-paid department as do other large cities. We have only three men to an engine and two to a hose company, who are paid to be on service all the time. The rest of the force is made up of extra men who work at other occupations, answering alarms but getting to a fire the best they can. All the firemen ought to be on full pay and kept in readiness to ride to a fire and be in condition for work when they get there. We have not a proper proportion of engines for so large a city, and we are very short of hose, no extra supply being kept on hand.

In this city we are peculiarly subject to fires. Our long dry summers and prevailing strong winds make it difficult to control fires if they once get a start. The city is a wooden one and closely built up. It would seem, therefore, that every effort should be made to get the firemen to the spot as soon as possible after an alarm. Provision should be made for them to ride, both as a means of speed and that they shall not arrive out of breath and unfit for active work.

It is understood by those in a position to know, that our fire department here is a good one as far as it goes, but it does not go far enough. It is able to control a large fire, but should a conflagration occur, it would be powerless, and immense damage would result. We ought to take the experiences of other cities and not wait for one of our own of this kind. In what is known as the foundry or lumber district, south of Market street, there is a vast amount of property that might be destroyed any day should a fire once get the upper hand. Only about 40 per cent of the property in San Francisco is insured, so the citizens are more interested than the underwriters in this matter. The subject is one that demands immediate attention. The chief engineer has asked for many things which economy has denied him. But it is a false economy not to provide for contingencies under the existing conditions.

ELECTRICAL POWER AND MILLS.—The Virginia *Enterprise* says: "Owing to the great scarcity of water in Marlette lake, the Nevada mill, which has been run by water-power, electrically conducted, has been forced to hang up its stamps, and ore shipments from the Hale and Norcross have in consequence been temporarily suspended. The electric plant was working as well on the last day of the working of the mills as at any other time since it started. Its exact value, as compared to steam, direct Pelton wheel water-power, or power transmitted from Pelton wheels by wire ropes, has not been figured out by the management."

MAKING A LAP WELD.—If trouble is experienced in making a lap weld, says the *Practical Mechanic*, and if one end of the weld refuses to stick, open that place with a chisel, lay in a piece of Russia sheet iron, close the weld and take another heat. It is almost sure to stick after such treatment. Soft iron filings may be employed with equal results.

THE Comstock pay-rolls for June aggregated $199,496.

WHEAT AND FLOUR.

Raising Wheat at Half a Cent a Pound.

"What is the lowest figure at which wheat can be grown so as to leave a living profit for the farmer?" is a question which has been discussed at greater length, probably, than almost anything else in the domain of agriculture. The elements which enter into the problem are of course different in each of the great wheat-growing regions of the world. The prices paid for land, labor and transportation, and the different methods of cultivation and harvesting employed, are of such great divergence in the different wheat-producing regions that anything like a general rule cannot be laid down. One thing only is certain, however, and that is that no matter what the difference in cost of production may be, the grain-growers of England, America, Australia or India, all meet on a common ground when they seek the great wheat markets of the world.

For our present purpose, we confine our remarks to California and under all the most favorable conditions which can be found in this highly favored region. We take the figures of an intelligent Tulare county wheat-grower—Mr. G. S. Berry—the owner of some 4000 acres of wheat land in that county, who communicated the facts some months ago to a correspondent of a San Francisco daily paper, from which we collate as follows:

Mr. Berry found, as all wheat-growers know, that the outlay for purchasing and maintaining the teams necessary to cultivate so large a wheat ranch, with the sum paid for manual labor, represented a good share of the cost of producing his crops. Naturally, then, his efforts were directed toward ascertaining if there were not some method of reducing this cost. The horses or other animals necessary for plowing and harvesting were in use but a portion of the year, and for several months they required a large outlay for feed while bringing in nothing. Consequently the idea suggested itself that steam might be utilized to take the place of the numerous teams and accompanying drivers. After considerable experiment, Mr. Berry invented a traction engine, by which at first a combined harvester and thrasher were operated most successfully. This engine is of 30-horse power and weighs 15 tons.

Plowing by Steam.

Finding that the traction engine worked with success in operating the harvester and thrasher, the next step was a natural one. Why should not the plows be operated in the same manner? This question was quickly solved. It required, of course, some experimenting to determine the best means to be used so as to secure the best results; but all difficulties have been met and solved, and now the entire work of cultivating and harvesting this immense 4000-acre wheat-field is done by the powerful aid of steam. Five gangs of four plows each are attached to the engine with chains, each gang having a separate connection. The plows cut a furrow ten inches wide and five inches deep. The gangs are also connected with each other by chains, so that they cannot spread apart and leave any of the soil untouched.

Working Night and Day.

One of the most important things about the use of steam in plowing is the fact that upon the ranch in question the work of plowing goes on night and day. There is no stopping except for meals. If the land is in good condition, from 70 to 80 acres a day will be plowed, seeded and harrowed, and it is therefore evident that the cost per acre must be a very small sum. Mr. Berry puts the cost for the three years which he has been following this method at 35 cents per acre annually. When the soil is in the most favorable condition it is possible to run as many as seven gangs instead of five, which, of course, largely increases the area plowed daily and correspondingly reduces the cost per acre.

Harvesting by Steam.

With land plowed to a depth of five inches, and with an average rainfall, there will be a good crop ready for the harvester. The steam engine is attached to the combined harvester and thrasher and the grain is quickly reaped in swaths 40 feet wide at a time. For so wide a cut as this the cutting-bar is made in two sections, jointed in the center. It thus is enabled to accommodate itself to any inequalities in the surface of the ground, and the grain is all saved. Actual experiment has shown that in thus harvesting and thrashing at the same operation there is a very large increase in the amount of grain secured as compared with the old system of stacking and thrashing after the harvest is over. From three to eight bushels to the acre are claimed to have been saved in this manner. From 90 to 100 acres a day can be harvested and thrashed when an engine furnishes the motive-power, and the grain is left sewed in sacks and scattered along the route followed by the machine, to be gathered by teams and hauled to a shipping point. With such rapidity in harvesting, it need hardly be said that the cost is reduced to a very low point, 30 cents an acre being given on the average for three years.

Summing Up the Cost.

For convenience in estimating, 100 acres will be taken as a basis for determining the cost per pound of wheat raised in this manner. The plowing and seeding, at 35 cents an acre, would require an outlay of $35. The seed, at an average rate, would cost $60. The harvesting would require $30 more. For three years, which included one very bad season, the average yield has been seven sacks to the acre, or about 840 pounds. The sacks cost eight cents each, or about $56 for the 100 acres. The engine, thrasher and plows cost $7000. Ten per cent on this for the 4000 acres would be 17½ cents an acre, or $17.50 for the 100 acres. The land under discussion cost the present owner but a very small sum, perhaps not over $5 an acre all told. The account would then stand something like this for the 100 acres:

Plowing and seeding	$35 00
Seed	60 00
Harvesting	30 00
Sacks	56 00
Interest on cost of machinery	17 50
Interest on land	30 00
Total cost per 100 acres	$228 50

The receipts would be, at a low valuation, 840 pounds to the acre. The total cost for producing the crop of each acre being $2.28½, it follows that the cost of raising a pound of wheat on the ranch would be .27 of a cent. Adding the average freight charge to San Francisco, .20 of a cent, it is seen that wheat can be laid down at a shipping point, under the methods described here, for half a cent a pound. And that such is the case when practiced upon a large scale Mr. Berry assures your correspondent has been the result of his experience for the past three years. It should, perhaps, be mentioned in this connection, one factor in lowering the cost is found in the fact that the railroad passes directly through the ranch in question, and that the cost of putting the grain on board the cars is therefore nominal. But in any event that would not cut much of a figure in the case, and the fact remains that it is possible for hundreds of thousands of acres of land in California to be devoted to wheat growing by the aid of steam, the crops from which can be sold at a price never yet reached, and still leave a profit for the farmer.

WHEAT AND RAIN.—Mr. Albert Montpellier of the Grangers' bank of this city has published an elaborate table of the rainfall in the principal agricultural districts of California from 1879 to date. It shows that in 1880, on an acreage of 2,240,000 acres seeded to wheat, a crop of 1,700,000 tons was raised; again, in 1884, on an acreage of 3,060,000 acres, 1,500,000 tons were raised, and this season, with 3,300,000 acres seeded to wheat, a crop estimated at 1,500,000 tons will be garnered. In each year named, and they produced the three largest crops in the history of the State, the quantity of rain that fell was not so important a factor as the time at which it fell. For instance, in 1880, taking San Francisco as an illustration, out of a total of 26.66 inches, 10.06 inches fell in April and 1.12 inches in May. The rainfall of each month at all prominent points in the State is given in detail, and altogether the table contains information of great value to all persons interested in California's agricultural future. The argument of the tables is to demonstrate that the wheat crop is in proportion to the rainfall of March and April. His tables, however, do not make the demonstration absolute. They show that the heavy crops of 1880 and 1884 had been preceded by a precipitation of 14.42 inches in March and April of the former, and of 10.10 inches in the same months of the latter year. But they likewise show that the March and April rainfall of 1886 was quite heavy, though that year's crop was light. It seems that more observations will be required to convert what is now a presumption into an actual demonstration.

THE CALIFORNIA WHEAT AND FRUIT CROPS. It appears from statistics carefully prepared by Mr. Montpellier of the Grangers' bank that the wheat acreage in this State has increased a million acres, or nearly 50 per cent, since the beginning of the decade. The development is noteworthy, because it may be said that the grape and fruit industry took its great advance from about 1880. It thus appears that the more valuable crops were not produced at the expense of the wheat crop, but that the latter grew side by side and even faster than they. Both were grown on land which was reclaimed from pasturage. Mr. Montpellier's estimate of the acreage now planted in wheat is 3,3000,000 acres, say one-fourth of all the land under cultivation in the State. It is reckoned that one-third of the total acreage of the State—say 33,000,000 acres—is susceptible of cultivation with a moderate a supply of water. California may thus expand her wheat acreage to 10,000,000 acres without encroaching upon land which ought to be devoted to the cultivation of fruit, and we may live to see a crop harvested which shall approach 5,000,000 tons, which is about the product of Dakota, Illinois, Indiana and Iowa combined. The wheat yield per acre of land in this State varies from 9¾ bushels to 22 bushels, according to the quality of the land and the vicissitudes of the season. Taking one year with another, wheat-growers cannot count on a higher acreage for the whole State than 14 bushels. This is just what Mr. Montpellier allows for this year's crop. With irrigation the average might be doubled—that is to say, we might raise on this year's average nearly 3,000,000 tons of wheat, which would leave us 2,600,000 tons for export.

WHEAT STATISTICS.—Senator John Boggs of Colusa county, says the Woodland *Democrat*, has made a calculation on the Colusa wheat crop and also on that of the State. He says there will be 5,000,000 sacks raised in Colusa county this year and 2,000,000 tons in the State. A little calculation shows that this would load 200,000 cars. Allowing 30 feet to the car, it would make a train 1136 miles long. It would require over 500 cars a day for 365 days to take it out of the State. It would load 2000 ships, allowing 1000 tons to the ships. Allowing 15 sacks to the ton, and each sack 32 inches long, and lay them end to end, they would reach 15,150 miles and have one sack over.

THE MILLSTONE AND ROLLER.—The old, old question "Can a millstone be used to advantage in a modern flour mill?" has recently sprung up again in some of our exchanges on both sides of the water, and it brings out anew all the old arguments and prejudices on that subject. The conclusion reached, founded on the arguments we have heard and read, is that there is a place in the course of reduction where millstones will give more satisfactory results than rollers, and it is a fact that many of the best roller-mills in the country find a few runs of stone extremely desirable.

EUROPE raises 1,200,000,000 bushels of wheat yearly, twice as much as the American production. Our wheat land requires 50,000,000 bushels for seed. We export 95,000,000 bushels.

Obituary.

John B. Ward, a pioneer of this State, died at his home in Alameda, on Saturday last. Mr. Ward first came to this coast on a sailing vessel in 1837, and again returned in 1846 or 1847, since which time he has been a resident of this State. He married into one of the native Californian families; he has not been in business for years. Mr. Ward devoted much of the time during the last year of his life to scientific investigations in certain branches of mechanics, made many inventions and obtained a number of patents. He was greatly interested for a long time in flying machines, and spent thousands of dollars for perfecting mechanical devices to that end. He finally gave that up and devised a peculiar model for vessels with which he experimented, going to New York to obtain the advice of skilled naval architects. Incidental to this he invented several forms of boilers, propellers and a steam engine. He was unable to obtain the assistance of capital to build a vessel on a practical scale, though very confident of ultimate success. Mr. Ward was a man of genial nature, and possessed a great fund of information concerning the stirring events of the early days of California.

Prof. Joshua E. Clayton, the well-known mining engineer and metallurgist, died at Spokane Falls, Washington Territory, on the 4th inst., from the effects of injuries received by a stage accident at Wardner Junction. Prof. Clayton was prominently connected with the mining industry of the coast for many years and was widely known. He was a scientific man with an enviable reputation for integrity and uprightness of character. For a long time Prof. Clayton identified himself with Utah mines, but of late has been more or less in Oregon, Idaho and Montana. There were few "experts" better known than he. It is not many months since he visited the editorial rooms of the PRESS, being then on his way south to examine and report on certain mining properties. He had very great faith in the mineral regions of the Northwest, and has by his pen greatly aided in attracting attention in that direction. Prof. Clayton was a man of scientific attainments and great technical knowledge, whose opinion of a mining property was of great value. He was highly respected by members of his profession and by all with whom he became associated.

On Saturday night last Andrew Carrigan, of the hardware firm of Dunham, Carrigan & Hayden Co., died in San Rafael. Mr. Carrigan, who was 50 years of age, came to California in 1860. His first commercial connections in San Francisco were with the old and well-known firm of Conroy & O'Connor. With others he afterward bought out that firm, and later formed a partnership with B. F. Dunham, under the firm name of Dunham & Carrigan. Not long since the title of the firm was changed to the Dunham, Carrigan & Hayden Co. It has been for many years one of the leading hardware houses of the Pacific Coast. Owing to the industry and integrity of the members of the firm, a very large business has been built up. Mr. Carrigan was well liked by all his associates, and has always been recognized as one of our leading merchants, having a high reputation for business ability and integrity. The pall-bearers at the funeral were James Carolan, L. L. Baker, J. W. Flood, John Woodlock, Irving M. Scott, Henry T. Scott, A. A. Watkins, J. O. B. Gunn, Geo. W. Gibbs, John T. Merrill, L. R. Gibson, Captain Knowles, C. H. Tompkins, James Spiers and A. Loughborough.

The Little Pittsburg.

Horizontal Deposits that Paid Well.

The once famous Little Pittsburg Consolidated Mining Company has gone out of existence, so far as owning mining property is concerned. The property was bought at a judgment sale by the Little Chief Company some months ago. It was not redeemed and the Little Chief took possession of the property.

The Little Pittsburg was once the most widely known property in the West. It is the mine out of which ex Senator Tabor made the greater portion of his fortune, and out of which Messrs Moffat and Chaffee afterward made a large amount of money. It was the bonanza of central interest in the boom of 1879, and the effect of the deal in its stock by Messrs. Moffat, Chaffee and others in 1880 inaugurated the panic in mining stocks and a great distrust of mining investments, from which the country is just emerging.

The Little Pittsburg was discovered in May, 1878, by Messrs. August Riche and George T. Cook, both now well-known citizens of Denver. Mr. Tabor, who then kept a general merchandise store in Leadville, had grub staked them with supplies amounting to about $17 in value. Messrs. Hook and Riche began prospecting on Fryer hill, which was supposed to be a drift or gravel deposit, but on which George Fryer had found lead carbonate ore about three weeks before. Ore was struck in Riche's shaft at a depth of 26 feet. About that time Mr. Tabor offered his interest for $800. The first load of ore dug out—and it was dug out about as dirt is dug out of a cellar—sold for $200. From that time on the product increased rapidly. Then came trouble, with lawsuits looming up in the distance, between the Little Pittsburg, Winnemuc and New Discovery, but Mr. Tabor and his partners settled it by buying both claims. Messrs. Tabor and Riche bought out Hook for $98 000, and this was followed by Messrs. Moffat and Chaffee buying Riche's interest for $263,500. Late in 1878 the Little Pittsburg Consolidated was formed, the claims embraced being the three mentioned with the Dives added. There were large bodies of ore in sight then, and the average value per ton was 110 ounces of silver and 22 per cent lead, and about 80 per cent of the total product was net profit. The capital stock of the company was $22 000,000 in $50 shares, and the deal ran stock up to about $40 per share, the principal holders unloading at big prices. Mr. Tabor had previously sold out to Messrs. Moffat and Chaffee.

The Little Pittsburg Co. in the three years following the discovery produced a total value of $4,250 000. The last of the three years the dividends paid amounted to over $1 000,000, and it was upon these dividends, together with the enormous ore bodies reported in sight, that the stock was run up so high. There were large blocks of ore in sight, but they were too low grade to pay for working. This fact was carefully omitted from the statements emanating from reliable sources in the company, but its importance was not noticed by the general public, and they went blindly ahead buying stock, expecting these ore bodies to yield as well as the ore that had been extracted so profitably. Of course it did not, and the crash came. Since then the production of the mine has not been very important, as it was practically exhausted. There is some unexplored territory on the property, but it is not very promising.

The Little Chief crosses the Little Pittsburg, cutting it in halves, and the connected and conflicted workings have been the scene of some sharp and death-resulting contests. The Little Chief had enormous ore bodies, and yielded several million dollars, but it, too, is about exhausted. These horizontal deposits are worked out like coal mines, and in that respect are far different from permanent fissure veins. But they have the advantage of yielding their values rapidly, so whatever profit they produce "comes in a hurry." The history of the Little Pittsburg stock deal is an instructive one for investors to study. It does not follow that because a mine of limited territory pays large dividends this year it will continue to pay them for other years to come. In determining the value of a stock or mine, there are a good many things to be considered other than the fact that it is or has been paying large dividends, and has large blocks of ore in sight.—*Mining Industry.*

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. C. HOAG—San Francisco.
R. G. BAILEY—San Francisco.
J. G. H. LOMPADINS—Oakland, Cal.
WM. H. COOK—Fresno and Santa Cruz Cos.
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H. G. PARSONS—Central California.
GEO WILSON—Sacramento Co.
FRANK S. CHAPIN—Butte and Plumas Coe.
E. H. SCHAEFFLE—Calaveras and Tuolumne Cos.
DR. W. F. DRAKE—Sonora, Cal.
CHAS. DUGAN—Stanislaus Co.
A. F. JEWETT—Tulare Co.
JULES BAUMANN—Arizona.
CHAS. F. BLACKBURN—Idaho.
R. G. HUSTON—Montana.

THE customs collections at San Diego for the fiscal year ending June 30, 1889, show a total of $311,937.59. The value of merchandise exported was $376,797.

DELINQUENT SALE NOTICE.

Gray Eagle Mining Company —Location of principal place of business San Francisco, California. Location of works, Placer county, Cal.

NOTICE.—There are delinquent upon the following described Stock, on account of Assessment No. 1 levied on the 14th day of May, 1889, the several amounts set opposite the names of the respective Shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amt.
Bogart, O H, Trustee	447	5,000	$250 00
" "	457	200	5 00
Chase, Q A	419	3,424	140 70
Carnes W A	252	476	20 00
Durning, T G, Trustee	196	100	5 00
Duncan, John	167	300	15 00
"	247	12	60
Erlenkamp, John	63	200	10 00
"	69	200	10 00
Francis, H L	444	1,500	75 00
Hall, Wm E	131	900	45 00
"	134	1,000	50 00
Hall, Wm E, Trustee	411	200	10 00
" "	412	200	10 00
" "	4 3	100	5 00
Stout, C S, Trustee	422	100	5 00
Waller, L P F, Trustee	387	3,000	150 00
Wetzel, Thos, Trustee	60	250	12 50
" "	169	100	5 00
" "	288	10	50
" "	335	100	5 00
" "	396	500	25 00
" "	397	500	25 00

And in accordance with law, and an order of the Board of Directors, made on the 28th day of June, 1889, so many shares of each parcel of such Stock as may be necessary will be sold at public auction, at the office of the Company, 327 Pine street, room 9, San Francisco, California, on Tuesday, the 23d day of July, 1889, at the hour of 10 o'clock A. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale. O. H. BOGART, Secretary.

Office, 327 Pine street, room 9, San Francisco, Cal.

This paper is printed with Ink Manufactured by Charles Eneu Johnson & Co., 500 South 10th St., Philadelphia. Branch Offices—47 Rose St., New York, and 40 La Salle St., Chicago Agent for the Pacific Coast—Joseph H. Doretty 529 Commercial St., S. F.

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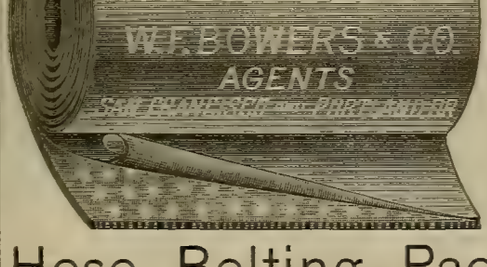
THE BUFFALO CONSOLIDATED GOLD Mining Company, Sierra Cnty, Cal. Ernest Busch, Superintendent. Stock divided into 50,000 shares at $1 per share. The property comprises 3 locations. Ore finely decomposed, carries coarse gold. Size of ledge Tunnel No. 1, 32 ft.; No. 2, 25 ft.; No. 3, 10 ft. Fine black decomposed rock interspersed with white quartz. New 5-stamp mill run by a Pelton Wheel, blacksmith shop and boarding house. Stockholders: Ernest Busch, Hugh Murray, Frank Cook, J. G Lee, Henry Carpenter. For further information apply to Ernest Busch, supt, or Hugh Murray, Secy

THE CALIFORNIA CONSOLIDATED Gold Mining Company, Sierra Cnty, Cal., A. Schubert, President; Alvin Fischer, Secretary; A. Leder, Superintendent. Divided into 50,000 shares at $1 each. Property comprises two locations. Ore assays $7 per ton, average. Coarse gold, solid rock; vein from 15 inches to 2 feet wide. Tunnel No. 1 in 12 feet, and prospects well. No. 2 just begun. Stockholders: Alvin Fischer, A. Schubert, Gus Fischer, F L. Fischer, Anton Fischer, Fred Fischer For information concerning stock, etc., apply to F. L. Fischer, Sierra City.

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One 3½x13 ft. Air Receiver.
One Tustin Pulverizer, with new wearing parts, such as Rolls, Grates, etc.
The above are in first-class condition and will be sold cheap. For price apply to the
PAYMASTER MINING CO.,
Yuma, Arizona Territory.

DIVIDEND NOTICE.

THE GERMAN SAVINGS & LOAN SOCIETY
526 California Street.
For the half year ending June 30, 1889, a dividend has been declared at the rate of five and one-tenth (5 1-10) per cent per annum on Term Deposits, and four and one-quarter (4¼) per cent per annum on Ordinary Deposits, payable on and after Monday, July 1, 1889.
GEO. TOURNY, Secretary.

SAVE MONEY

— BY USING —

WATER POWER TRANSMITTED BY ELECTRICITY

To Run your Mills, Hoists and Trams.

For Circular giving particulars send to

KEITH ELECTRIC CO.,

— MANUFACTURERS OF —

Apparatus for Electric Light and Electric Power,

OFFICE, 40 NEVADA BLOCK,

Factory, Stevenson St., bet. First and Ecker, **SAN FRANCISCO, CAL.**

THOMSON-HOUSTON ELECTRIC CO.

— MANUFACTURERS OF —

Arc and Incandescent Systems of

ELECTRIC LIGHTING.

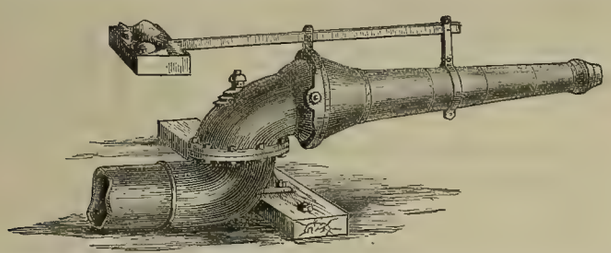
Electric Motors. **Electric Railways.**

SAMUEL H. TAYLOR, General Agent,

234 Montgomery Street, - San Francisco, Cal.

Estimates Furnished. **Catalogues Sent on Application.**

IMPROVED FORM OF HYDRAULIC GIANTS.



THE ABOVE CUT ILLUSTRATES THE IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture. We guarantee purchasers of this form of Giants against all costs, expenses or damages which may arise from any adverse suits or actions at law. We are further prepared to furnish **Single-Jointed Giants** when required. Prices, discounts and Catalogues of our specialties of **Hydraulic Mining Machinery** sent on application.

JOSHUA HENDY MACHINE WORKS, 39 to 51 Fremont St., San Francisco.

1889. CATALOGUE OF 200 PAGES. **1889.**

The matter is readily available.—*Tradesman.*

A Complete Work.—*Colliery Engineer.*

Handy for reference.—*Min. and Sci. Press.*

Should be in the hands of every Engineer and Contractor.—*Eng. and Min. Journal.*

A valuable addition to the literature on the subject.—*Eng. and B'l'g Record.*

A TREATISE AND HANDBOOK ON

ROCK DRILLING

—AND—

AIR COMPRESSING

Mailed Free.

In reality a handbook.—*Am. Manf'act'r.*

Supplies a long felt want.—*Manf'rs' Record.*

This Catalogue is one of unusual interest and value.—*R. R. Gazette.*

This is a thoroughly good publication.—*Engineering News.*

The useful information will be found specially valuable. — *Eng. and B'l'g Record.*

RAND DRILL CO.,

23 Park Place, New York.

"RED 

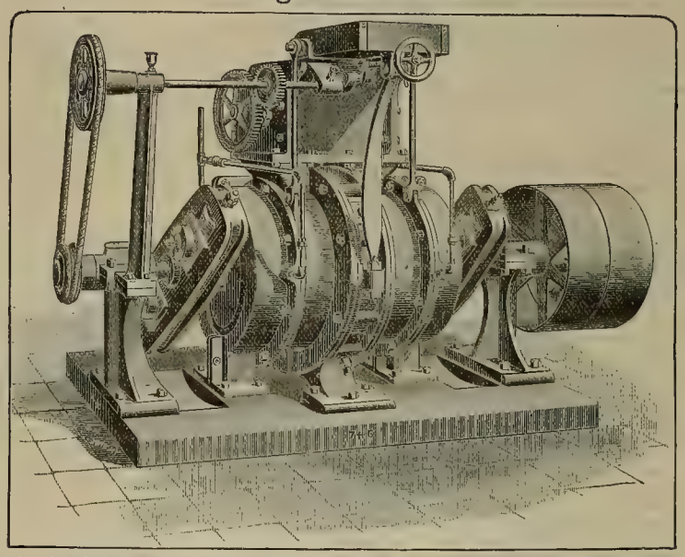
CORD"

SQUARE FLAX PACKING,

Manufactured from strictly first-class Flax and pure lubricants. Superior to all others for Water and Steam. Packs with less friction and makes a tighter joint than any other packing made. ☞ Imitations of inferior quality having been put upon the market, we have been compelled to adopt the above trade-mark, and all of our packing will now have a RED CORD running through the center its entire length. See that you get it and take no other. Sold by all hardware dealers. Price, 50 cents per pound. **W. T. Y. SCHENCK,** Sole Manufacturer, **222 and 224 Market Street, San Francisco, Cal.**

FRISBEE WET MILL.

This Mill, with a weight of less than 9000 pounds, has a capacity of three tons per hour of hard quartz to 40 mesh; has been thoroughly tested; we guarantee its work as represented, and we will give long time trial.



IT HAS NO MORE WEARING PARTS THAN CORNISH ROLLS,

And renewals will not cost over one-half as much as for stamps. Will run empty, or with small amount of ore without injury. The attention of parties having Cement Gravel is called to this Mill, as it will run 100 tons per day to No. 8 mesh; 30 to 35 H. P.

OUR DRY MILLS are the most economical ever built, and are extensively used with record of several years. No grinding in pans. Mill finishes to any fineness desired.

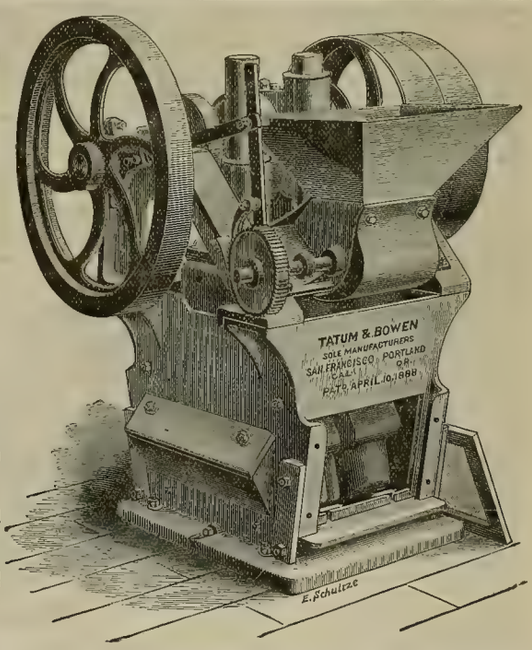
FRISBEE-LUCOP MILL COMPANY.

GIDEON FRISBEE, Manager, - - 59 & 61 First Street, San Francisco

HOOKER & LAWRENCE, Gen'l Ag'ts. 145 Broadway, New York.

—THE—

PERFECTED DOUBLE Economic Quartz Mill.



Attached to each Mill is an effective

Automatic Ore Feeder.

THE CRUSHING is done by the rapid rocking movement in OPPOSITE DIRECTIONS of two heavy castings, the bottoms of which are slightly circular in form, and each provided with our shoes.

The Mill is a closer Gold-Saver and catches a larger percentage of the Clean-up in the Battery than any other Mill.

It costs less, in proportion to what it will do, than any other mill. There are no working parts to buy for it, no matter how long it is used, except shoes and dies. Capacity of Mill, 6 to 10 tons per day. Weight of Mill, complete, 6400 pounds.

We manufacture, to go with the Mill, an

IMPROVED ROCK BREAKER.

Power required for Mill and Rock Breaker, 6 H. P. SEND FOR CIRCULAR. Address:

TATUM & BOWEN,

34 and 36 FREMONT ST., SAN FRANCISCO, CAL., AND PORTLAND, OREGON.

MANUFACTURERS OF MINING AND SAW MILL MACHINERY.

The Batho Furnace.

(*Continued from page 21.*)

Wailes and Dick, before the British Iron and Steel Institute in 1887.

It is unlike the old-style open-hearth furnaces, which are put into one solid compact building, in which all the apparatus necessary to the various operations are built, in that it consists of five separate wrought-iron cases, all on one level, lined with fire-brick, which form the outside walls of the four regenerators and of the melting chamber.

This arrangement guides the flame downward right on the hearth, and does away with much of the sharp cutting action of the flame on the roof, which thus has to stand the reflected and radiated heat only. The basic lining is separated from the acid by one-fourth to one-half inch only of neutral material in the form of carbon brick or chrome ore. The upper 18 inches of the lining walls of the melting chamber are of silica brick. The Batho furnace is well adapted for the basic process on account of the facility of getting at and replacing the linings. The round regenerator cases have large doors opening into them extending from top to bottom of the regenerators, and the roofs are removable, rendering them very accessible for cleaning out and repairing. It is claimed that repairs can be made in the Batho furnaces very rapidly, records having been made repeatedly of stopping at 10 A. M. Saturday, the furnace allowed to cool off until Sunday morning, when the regenerators were cleaned out and relaid, new linings put into the furnace chamber, heat put on to the furnace Sunday evening, and the furnace prepared to charge for another 15-ton heat on Monday afternoon at 4 P. M. It is also claimed that the furnace heats up very rapidly, a cold 15 ton furnace being heated up ready to charge inside of 24 hours.

TECHNICAL LITERATURE.—The Milwaukee, Wis., National Publishing and Printing Co. has just issued Part I of "Handy Lists of Technical Literature." It is a reference catalogue of books, printed in English, from 1880 to 1888 inclusive, to which is added a select list of books, printed before 1880, and still kept on jobbers' and publishers' lists. Part I treats of useful arts in general, products and processes used in manufacture, technology and trades. The numerous publications, relating to the practical arts, trades and manufactures, have never been properly catalogued. These "Handy Lists" to the technical literature of the last eight years will be found very useful to many. The lists are alphabetically arranged, so that any branch of mechanics, arts or trades can be readily referred to. Those who want to know of all the books referring to any special branch can here find the titles, cost and names of publishers. Other lists will follow this, which just has been published. The little work is a very useful one to people engaged in any mechanical or technical industry.

ROSSITER W. RAYMOND, of the *Engineering and Mining Journal*, and Secretary of the American Institute of Mining Engineers, was in this city during the week. He is not here on professional business, but on a pleasure trip, having come from Denver, where a meeting of the Institute has been held. Mr. Raymond left here on Wednesday night for the Yosemite and from there will go to the Grand canyon of the Colorado, where a stop of several days will be made. The party, which includes several ladies, has a special car. Among others of the party is E. E. Farnow, chief of the Forestry Division, who is investigating the forests of the coast in connection with the irrigation problem which Government officers are now engaged upon.

THAT COMET.—The Director of the Lick Observatory was notified by Prof. Lewis Swift of Rochester, N. Y., of the discovery of a new comet on July 5th. Prof. Holden now says that the comet reported to have been discovered by Prof. Swift on the morning of July 5th is probably that which was discovered by Mr. Barnard at the Lick Observatory on September 2d of last year, and which has been continuously under observation here since that date. There is evidently an error of about one hour and 23 minutes in Prof. Swift's reported position, as no comet, faint or otherwise, was found by Mr. Barnard in the place telegraphed.

The English Dam.

EDITORS PRESS:—Your letter of July 3d and the Press of June 22d and 29th were duly received, and you have my sincere thanks for the same. The description of the breaking of the "English Dam" is the most complete I have seen, but, as you remark in your letter, "it did not in any way treat of the cause of the breakage, which was only incidentally mentioned." This refers, I presume, to the lines quoted from your editorial of June 29th in my letter to you, which I again quote as follows: "Only one of these large dams in California has ever broken, and that was weakened by dynamite, applied by enemies of the owner."

Now, Mr. Editor, I know you would not willfully do an injured community a grievous wrong by casting unjust reflections upon it. I therefore pen these few lines in its behalf, hoping you may find space in your valuable journal for the same. The description said: "Early in the morning the watchman heard two violent explosions and then saw the water pouring through an opening in the upper timber over the crest of the stone work."

They did not *see*, but they *heard*, and yet they were employed to watch it. The break occurred in the "timber over the stonework." Might not some of the timber have become rotten, thus adding to the pressure on the sound timber, causing heavy breaks and sounds like an explosion? And would not to those half-asleep eyes and ears any noise have seemed like an explosion? And again, *that* noise must have resembled more the shock of a continuous earthquake than a dynamite blast. And again, you are betrayed to say it was "applied by enemies of the owner." Doubtless *that* owner, or owners, had many enemies in the region of *that* dam, but a very dull mind can readily perceive who is meant by the innuendo. It is the men who have fought for their homes, lands and lives, in the courts provided by the State and the Nation, who have shown more patience and endurance under the most trying circumstances, especially since the law concerning hydraulic mining has been promulgated and the systematic violation of it has been practiced, than any wrongs recorded in history which men incurred without recourse to violence. If these men are not amenable to the charge of cowardice under this cruel infliction they challenge our admiration for their support of law and order. Please remember that no definite charges have been made—only innuendos, and only to damage a complainant because he could not be be defeated before the bar of justice or civilization. Very truly yours,

Yuba City, July 9, 1889. GEO OHLEYER.

Mining Bureau Contributions.

The following are among the recent additions to the collection of the State Mining Bureau:

Dog-tooth spar, very fine crystals.

Lignite, Del Norte Co., Cal. Said to be in large quantity. R. W. Miller.

Iron ore of fine quality from two large ledges recently discovered in San Bernardino Co., Cal. One of the specimens was partly "loadstone"—natural magnet. H. W. Lake.

Cobalt ore, containing erythrite, smaltite and earthy cobalt, and rich in silver, chiefly in the form of argentite, with some native silver—a very remarkable and interesting combination. O. K. mine, San Gabriel District, Los Angeles Co., Cal. Wm. McEwen.

Gold in quartz crystals; beautiful specimens, Keystone mine, Humbug Creek, Siskiyou Co., Cal. D. Ream.

Bismutite, Antelope Springs, Deep Spring valley, Inyo Co., Cal. S. D. Woodhull.

Fossils from the Umpqua river, Oregon. D. C. Stone.

Pipestone (catlinite) from Jasper, Minnesota. Minneapolis Academy of Sciences.

Copper ore, Buchanan mine, Fresno Co., Cal.

JOSEPH D. GRANT, a graduate of the University of California, has been appointed a member of the Board of Trustees of the Leland Stanford, Jr., University, filling the vacancy occasioned by the death of Wm. Ashburner. The University will probably be open now within a year. The buildings are rapidly going up and assuming the proportions indicated in the plans of the architects. The main quadrangle is completed, and the big dormitory to the right awaits only the finishing touches. It, too, is roofed with Spanish tiles like the rest of the buildings. When Senator Stanford goes East he will probably set about arranging for the engagement of a faculty.

PATTERNMAKERS' STRIKE.—Messrs. Marschutz & Cantrell of the National Iron Works are having trouble with their patternmakers on the subject of employment of apprentices. The proprietors of the foundry will maintain their position as a matter of principle, and do not intend to discharge the apprentice whose employment has aroused the ire of the patternmakers.

THE Great Salt Lake is shrinking at the rate of two inches a week. The temperature averages 82 degrees.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific States.

From the official report of U. S. Patents in Dewey & Co.'s Patent Office Library, 220 Market St., S. F.

FOR WEEK ENDING JULY 2, 1889

406,077.—PIPE CUTTER — A. V. Anderson, Stockton, Cal.

406,191.—CASKET PEDESTAL—Belden & Taylor, Oakland, Cal.

406,200.—WELL-BORING APPARATUS — J. E. Day, S. F.

406,201.—ORE CONCENTRATOR—M. B. Dodge, S. F.

406,209.—ATTACHMENT FOR BAND SAWING MACHINE—E. S. Gilmore, S. F.

406,396.—BAND SAWING MACHINE—E. S. Gilmore, S. F.

406,051.—COOKING STOVE — William Lamb, Downey, Cal.

406,410.—MOP GRIP—J. H. Ware, Eureka, Cal.

406,156.—METAL CORNER PIECE FOR BOXES—J. C. Weir, S. F.

406,185.—BALL CASTER—J. C. Weir, S. F.

406,118.—INHALER—Henry T. Welch, San Jose, Cal.

The following brief list by telegraph, for July 11th, will appear more complete on receipt of mail advices:

California—T. L. Armstrong and E. Clark of Oakland and G. Cottrell (assignors to Union Fence Manufacturing Company, San Francisco), fence-making machine; C. A. Ashley of Stockton, raising and lowering mechanism for harvester; Walfred Burkman (assigned to C. H. Frost of Los Angeles), brick machine; Jean B. Gerber, San Francisco, submarine boat; Hiram H. Hannore, Santa Cruz, non-heat conducting fabric; James P. Hays, North Temescal, lifting-jack; Byron Jennings, San Jose, pruning shears and fruit picker; Edouard Lainesz, San Francisco, safety device for elevators; Edwin Mobrig, San Francisco, bicycle; Charles T. Tarpenning, Los Angeles, toaster or broiler.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

INHALER.—Henry T. Welch, San Jose. No. 406,118. Dated July 2, 1889. The object of this invention is to provide a shapely and convenient appliance for covering the nose and causing medicinal fumes and vapor to constantly rise into the nostrils, whereby such affections as colds, influenza and other forms of catarrh or derangement of mucous membrane may be relieved or cured.

PIPE-CUTTER.—A. V. Anderson, S. F. No. 406,077. Dated July 2, 1889. This improvement in pipe-cutters consists in the arrangement of the stock carrying a cutter-bit and guide-jaw, the bearing ring carried by the stock and about which such stock rotates, and the clamps or jaws of the bearing ring by which it is fixed on the pipe, the operating handle with its connecting strap and pawl and ratchet connection with the stock. The object is to provide a pipe cutter, which can be readily applied to the pipe and operated conveniently in any position.

CASKET PEDESTAL.—Harry B. Belden and Melvin A. Taylor, Oakland. No. 406,191. Dated July 2, 1889. For the purpose of supporting coffins, pedestals of various descriptions have been employed, and it is customary to make these pedestals in black when used for elderly persons and in white when used for children. This necessitates keeping at least two seperate sets on hand, and as they are somewhat expensive these inventors have designed a reversible pedestal in which either black or white may be made the exterior at will.

WELL-BORING APPARATUS.—J. E. Day assignor of one-half to Joseph Pracy, S. F. No. 406,200. Dated July 2, 1889. This improvement in well-boring apparatus consists in a combination of an auger or spiral, by which the boring is accomplished, with the outer tube or casing of a sand pump and valves fitted to the auger-blades, together with cutters forming the edge of the auger, projecting beyond the bottom of the cylinder barrel, the lower part of which is fitted to engage the backs of the cutters.

[From our issue of March 9, 1889.]

The "Mining and Scientific Press."

Any one connected with the mining or other industrial occupations on this coast cannot fail to find matter of interest and value in this and other numbers of the MINING AND SCIENTIFIC PRESS. The various departments of the paper are carefully made up of practical matters useful to all. Our correspondence has increased of late, as has our subscription and advertising patronage. As the oldest mining paper in the United States, the experience of the editors and accumulated facilities of the publishers are of value to the reader. We hope our old subscribers will bring the PRESS to the attention of those who would be benefited by becoming regular patrons.

CONSIDERABLE artesian well sinking is going on throughout the State of Nevada for two very good reasons—one being a needed supply of water, the other to receive the bounty offered by the last Legislature.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

JACALITOS OIL CO., July 9. Object, to bore for oil and manufacture oil products. Capital stock, $100,000. Directors—Timothy Ellsworth, Marcus D. Hyde, John C. Currier, Geo. W. Ross and Wm. Pinkerton.

MORAGA LAND ASSOCIATION, July 10. Object, to deal in land in Alameda and Contra Costa counties. Capital stock, $1,000,000. Directors—A. A. Grant, L. A. Grant, J. A. Burton, Arthur Burton and Edward Dexter.

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Commonwealth, July 9, $13,000; Justice, 9, $6446; Butte and Boston, 5, $25,600; Con. Cal. and Virginia, 6, $54,070; Justice, 3, $4297: Hanauer, 2, $4350; 3, $2900; Mt. Diablo, 11, $21,091; Hanauer, 4, $2700; Crescent, 6, $5500; Hanauer, 6, $6400; 9, $2800.

THE Oceanic steamer Alameda, which arrived here Saturday, from Sydney and Auckland, stopped at Apia, June 22, and took off nine officers and 63 men of the U. S. steamer Trenton. The party is in command of Lieut. S. L. Graham, and went to Mare Island navy-yard on their arrival here. Admiral Kimberley, his staff officers, and six men remain in Apia.

THE source of the Lassen county earthquakes seem to have been at Eagle lake, the water in which receded two feet, and it is feared that a subterranean outlet has been opened which may drain the lake. At the lakes the shocks were proceeded by a rumbling sound and accompanied by a loud explosion like a blast set off below ground.

The Crawford English and Manual Training School.

The proper education of the youth of both sexes is, to those who are responsible for their best interests, a question of vital importance. And to parents and guardians the selection of an educational institution best calculated to promote the desired end is a serious and, not seldom, a puzzling matter. The system practiced at the Crawford School, of combining manual training and mental culture, appeals to the practical wisdom of the parent in the present age, as well as to the natural sense and instincts of the pupil.

The course of study embraced in this establishment is comprehensive, comprising language, mathematics, physics, chemistry, geography, history, the commercial and mechanical industries, book-keeping and actual business usage; while especial attention is given to the manners, as well as the moral and physical well-being of the students under its charge. Each department is presided over by a capable and experienced teacher, all being under the management of the principal, Mr. T. O. Crawford, who, as an educator, has a wide and favorable reputation on the Pacific Coast.

For convenience, healthfulness and picturesque beauty, the location of the Crawford School cannot be excelled. The buildings are commodious and substantial, situated amid spacious and handsomely shaded grounds, fronting on one of Oakland's finest streets and sloping back to the beautiful sheet of water known as Lake Merritt.

Those who are interested will do well to send for a catalogue containing full particulars, addressing Mr. T. O. Crawford, Box 593, Oakland, Cal.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

Books on Working Ores.

BY GUIDO KUSTEL, M. E.

ROASTING OF GOLD AND SILVER ORES (Second Edition) and the Extraction of their Respective Metals without Quicksilver. By GUIDO KUSTEL, M. E. 1880.

This rare book on the treatment of gold and silver ore without quicksilver is liberally illustrated and crammed full of facts. It gives short and concise descriptions of various processes and apparatus employed in this country and in Europe, and the why and wherefore. It contains 156 pages, embracing illustrations of furnaces, supplements and working apparatus. It is a work of great merit, by an author whose reputation is unsurpassed in his specialty PRICE, $3, coin, postage free. Sold by DEWEY & CO., Publishers, 220 Market St., San Francisco, Cal.

BY C. H. AARON.

AARON'S LEACHING GOLD AND SILVER ORES, the most complete hand-book on the subject extant; 164 pages octavo. Illustrated by 12 lithographic engravings and four wood cuts. Fully indexed. Plainly written for practical men. In cloth, $3. Sold by DEWEY & CO., S. F.

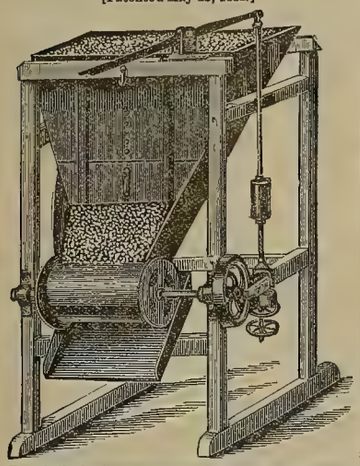
Practical Treatise on Hydraulic Mining.

BY AUG. J. BOWIE, JR.

This new and important book is on the use and construction of Ditches, Flumes, Dams, Pipes, Flow of Water on Heavy Grades, methods of mining shallow and deep placers, history and development of mines, records of gold washing, mechanical appliances, such as nozzles, hurdy-gurdys, rockers, undercurrents, etc.; also describes methods of blasting; tunnels and sluices; tailings and dump; duty of miners' inch, etc. A very practical work for gold miners and users of water. Price, $5, post-paid. For sale by DEWEY & CO., Publishers, 220 Market St., San Francisco.

THE ROLLER ORE FEEDER

[Patented May 28, 1882.]



THIS is the best and cheapest Ore Feeder now in use.

It has fewer parts, requires less power, is simpler in adjustment than any other. Feeds coarse ore or soft clay alike uniformly, under one or all the stamps in a battery as required.

In the Bunker Hill Mill it has run continuously for two years, never having been out of order or costing a dollar for repairs.

Golden State and Miners' Iron Works,

Sole Manufacturers,

227 First Street, San Francisco, Cal.

GO TO

American Exchange Hotel,

Sansome St., San Francisco. One door from Bank of Cal.



Rates $1, $1 25 and $1.50 Per Day. Free Coach.

The above Hotel is situated in the midst of the Banking and Commercial Houses of the city, and is by far the most home-like and desirable Hotel to stop at.

CHAS. & WM. MONTGOMERY, Prop'rs.

RICORD.

BEWARE OF IMITATIONS.

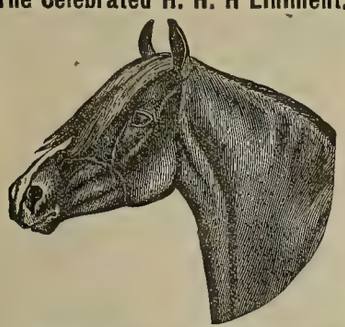
BUY NONE BUT THE GENUINE.

DR. RICORD'S RESTORATIVE PILLS, a specific for exhausted vitality, physical debility, wasted forces, nervous derangements, constitutional weakness, etc., approved by the Academy of Medicine, Paris, and the medical celebrities of the world. Agents, **J. G. STEELE & CO., 635 Market Street Palace Hotel, San Francisco, Cal.**

☞Sent by mail or express anywhere. Box of 50, $1.25; of 100, $2.00; of 200, $3.50; of 400, $6.00; preparatory pills, $2.00.

☞SEND FOR CIRCULARS.

The Celebrated H. H. H Liniment.



The **H. H. H. Liniment** is for the treatment of the Aches and Pains of Humanity, as well as for the ailments of the beasts of the fields. Testimonials from importers and breeders of blooded stock prove its wonderful curative properties. No man has ever used it for an ache or pain and been dissatisfied.

H. H. MOORE & SONS, Stockton, Cal., Proprietors.

FOR SALE BY ALL DRUGGISTS.

AT A BARGAIN.

A 20-STAMP

Dry Crushing Silver Mill,

With Furnace, Dryer, Pans, Settlers, Steam Power, etc., complete. New and of latest pattern. Can be changed to Wet Crushing if desired. Apply to

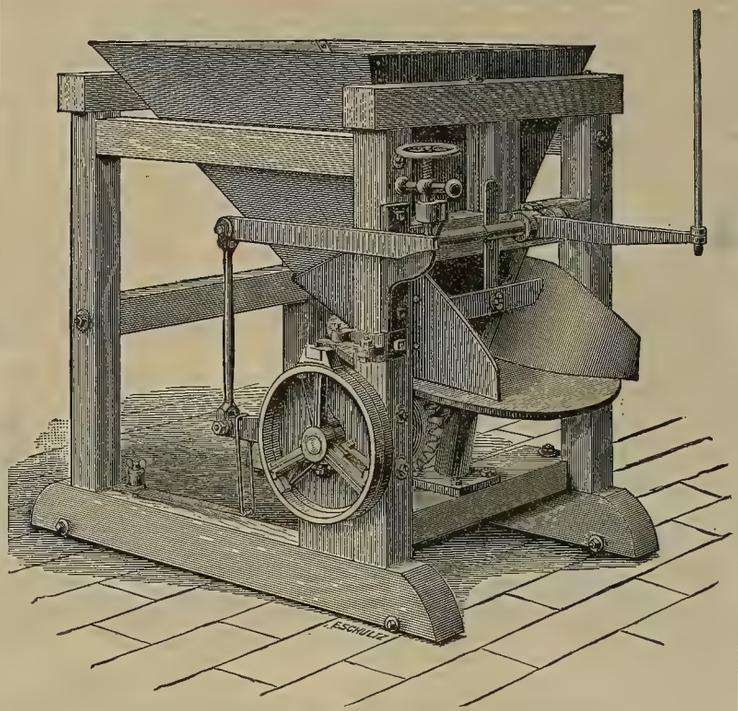
PACIFIC IRON WORKS,

127 FIRST STREET, SAN FRANCISCO,

—THE—

JOSHUA HENDY MACHINE WORKS,

Nos. 39 to 51 FREMONT STREET, SAN FRANCISCO, CAL.



"HENDY" IMPROVED "CHALLENGE" ORE FEEDER.

The **best form of Feeder ever devised,** and pronounced by reputable mining men to be far superior to any form of "Roller" Feeder manufactured. We refer to the following gentlemen who have furnished us with testimonial letters to the above effect, which can be seen at our office, viz.:

N. W. CROCKER, Supt. Bunker Hill Gold Mining Co., Amador City, Cal.
W. G. ROBERTS, Greenwood, El Dorado Co., Cal.
D. C. WICKHAM, Taylor Mine, Greenwood, Cal.
J. R. TREGLOAN, Supt. South Spring Hill Gold Mining Co., Amador City, Cal.

WE ARE MANUFACTURERS OF THE

"CHALLENGE," "STANFORD," "TULLOCK," & "ROLLER" FEEDERS,

And will furnish descriptive Catalogues and quote prices upon application.

FREEMAN'S

Dry Process

GOLD SEPARATOR.

They are good machines. If the gold is in the dirt they will save it. They will save finer gold than water will.

T. J. SCOTT,
Osceola, Nevada.

Smith & Drew took out Tuesday, in their dry wash diggings, in addition to 5 ozs. of fine gold, a nugget weighing 22 ozs. The machine used was Freeman's Dry Process Separator.—*Utah Daily Union, May 10, 1889.*

☞Send for descriptive Circular and Price List.

JAS. B. FREEMAN,
604 S. Spring St.,
LOS ANGELES, CAL.



ESTABLISHED 1866.

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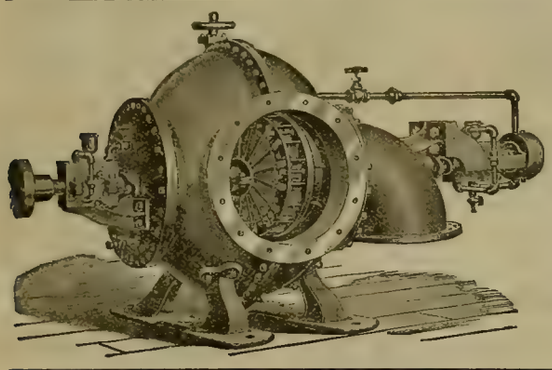
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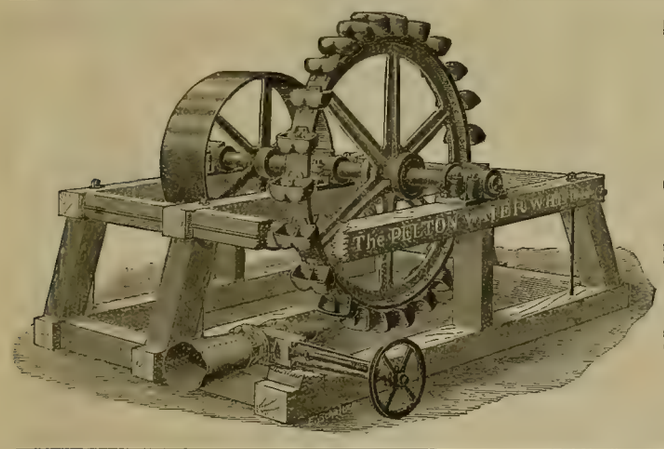
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, July 11, 1889.

Trade the past week was fair for the season. Traveling salesmen, as a rule, report interior merchants, with few exceptions, carrying light stocks, and consequently when buying sets in a very large trade is anticipated for. The large crops in this State, Oregon and Washington, combined with a strong advancing market for cereals, are creating a better feeling with the trade, and in consequence the hesitating, offish character of pushing business is now giving way to a more general desire of placing large lines of goods.

The local money market is easy. The payments being made on interest accounts, dividends, etc., aggregate larger this year than before known. Considerable money has been used for two or three years past in purchasing interior county, city and other bonds and securities, the interest on which amounts to a large sum. All the money so received will go into general circulation. Remittances from the interior are light, but then the coin sent into the interior to move the grain crops is, as yet, also light. The inquiry for funds from merchants is almost nil, as it is for speculative purposes. The only thing offering inducements to speculators is wheat and barley. Mining stocks are worked by manipulators too much in the way of the old game "head I win, tail you lose," to invite buying by outside capitalists and large speculators. It will take a genuine ore development to draw in moneyed men. Local securities are too high to offer safe or profitable investments.

For the week ending last Saturday, there was $187,345 placed on realty in this city, mostly at the rate of 6 per cent a year.

The last steamer for China took out the following treasure: For Hongkong, silver bullion, $46,500; Mexican dollars, 183,763; gold coin, $4562; gold dust, $70. Total, $234,895. For Shanghai, $25,160 in silver bullion.

The shipments of treasure from this city in June were as follows:

	1888.	1889.
Silver bars	$1,432,300	$864,700
Mexican dollars	323,588	1,078,355
Peruvian dollars	3,400	.....
Silver coin	6,700	3,600
Gold coin	1,135,420	144 978
Gold dust	1,710	985
Currency	190,250	157,000
Total	$3,093,318	$2,249,618

The amounts and descriptions of specie shipped from San Francisco in the first six months of the year compare as follows:

	1888.	1889.
Silver bars	$4,872,650	$4,737,400
Gold bars	1,400	.....
Mexican dollars	1,580,774	4,463,229
South American dollars	5,608	41,131
Gold coin	3,165,633	3,597,672
Silver coin	30,344	37,000
Gold dust	2 326	2,135
Currency	605,230	689,101
Total	$10,255,965	$13,618,369

S. H. Brooks, Assistant Treasurer United States at San Francisco, reports cash on hand June 29, 1889, as follows:

United States notes	$75,921 00
National bank notes	1,255 00
Gold coin	37,773,724 00
Standard silver dollars	18,266,232 00
Fractional silver	6,732,721 25
Gold certificates	4,900 00
Silver certificates	32,335 00
Minor coin	8,102 90
Total	$62,944,741 15

The shipments of silver from the Sub-Treasury, into the interior of the State and elsewhere for the month were as follows:

Standard dollars	$207,500
Fractional silver	68,760
Total	$276,260

Imports of treasure by sea the past week aggregate $15,171 in coin.

SILVER—With a shading off and a weak tone for exchanges, silver has not ruled so largely in advance over New York. The latter market has hardly been up to the London parity, why, it is difficult to say. The latter market is reported to be strong, owing chiefly to large speculative buying of Indian wheat in expectation of better prices. The output of this coast is said to be decreasing, chiefly owing to lessened supply of water for motive power. The yield of the Comstocks is quite light. At the low price of silver it hardly pays to work a silver mine at much of a depth, unless the ore is very rich in mineral. The Comstock mine managers appear to be intent on finding gold-bearing lodes.

MEXICAN DOLLARS—A sharp advance was made the past week, closing the market very strong at 75½ cents for new. The source of supply, it is claimed, is being well concentrated for better handling.

QUICKSILVER—Receipts the past week aggregate 497 flasks. The home demand is only fair, as it is shipping. Prices are nominally unchanged.

LIME—Receipts the past week aggregate only 2814 barrels. The home demand continues free, but for shipping it is light.

BORAX—Receipts are increasing, aggregating the past week 2,062 ctls. The exports the past week aggregate as follows, via C. P. R. R., 227 ctls. to Chicago and 196 ctls. to Pittsburg. The market continues steady with a firm tone reported at the East under a good demand and light stocks.

TIN—The imports the past week aggeegate 3437 ingots from Australia. The market for pigs is in buyers' favor for both spot, to arrive and shipment. The same remarks apply to tinplate. The consumption on this coast this year shows quite a falling off in comparison with 1888, due to a lessened pack of both fruits and salmon. Many packers, it is claimed, will probably carry over quite a liberal stock. On July 5th the London market was quoted as follows: Spot, £88 17s 6d, and three months' futures £89 12s 6d.

COPPER—The market is essentially unchanged. A report is current that the recent combination to sustain prices in this country has been broken, owing to the Tamarack Company not agreeing to lessen their output. The latter company's superior contract with the late French copper syndicate gives it a decided advantage as far as prices are concerned. In London, Chili bars and G. M. B. were quoted July 5th as follows: Spot £41 12s 6d; futures, £41.

LEAD.—The market is barely steady. The consumption is reported to be fully up, if not larger than in this month, 1888. The weak and lower market at the East is the delay of the Treasury in deciding the duty on Mexican ore, which will probably be several weeks before rendered. It is thought that the decision will be against the last ruling and in favor of former rates of duty.

ANTIMONY—The market is strong at an advance.

IRON—The local market is unchanged. The higher advancing freights for outward wheat cargoes here, it is claimed, will cause more to be shipped from England to this port. European mail advices are still of a very hopeful character, notwithstanding the market had a setback, owing to an increase in the output. At the East the market appears to be doing better with large orders hard to place, except at an advance.

COAL—Imports the past week were as follows: From Tacoma, 7495 tons; Nanaimo, 5566; Australia, 2547; Departure bay, 2725; Seattle, 1900; Comox, 4000. Total, 24,233 tons. The market for both house and steam is firm, but no higher. The feeling appears to be decidedly mixed, but as reported the general tenor is bearish, that is, while the impression is that prices for the immediate future will not go lower, yet the largest consumers will not anticipate their wants to any great extent, and with more vessels coming for wheat free shipments of coal to this port will be in order. The tonnage on berth at Newcastle, N. S. W., and Sydney, for this and neighboring ports is steadily increasing. Australian for shipment is offering at $7, while lower bids are submitted by cable.

Eastern Metal Markets.

By Telegraph.

NEW YORK, July 11, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	—	—	$—	$—	$—
Friday	42½	92	11 75	4 00	19 75
Saturday	42 3-16	92	11 75	3 95	19 80
Monday	42 3-16	92	11 75	3 90	19 75
Tuesday	42 3 16	92	11 75	3 92½	19 50
Wednesday	42 3-16	92½	11 75	3 90	19 50

NEW YORK, July 9.—Borax is firm at the late advance. The arrival of the ship Charmer with 8000 packages helps pressing wants. Quicksilver is unchanged. There have been enlarged deliveries of Lake copper, rumored at 11¾@12c. Baltimore and other casting brands are no dearer. Pig lead is quiet and weak at $3.90@3.92½. Refined petroleum in barrels, $7.20; plain cases, $9.10.

San Francisco Metal Market.

	WHOLESALE. THURSDAY, July 11, 1889.	
ANTIMONY—	15 @	16
BORAX—Refined	7¼@	7¾
Powdered	7¾@	7¾
Concentrated	— @	6¾
COPPER—		
Bolt	21 @	22
Sheathing	22 @	24
Ingot, jobbing	15 @	16
do, wholesale	12 @	13
Fire Box Sheets	22 @	24
LEAD—Pig	4½@	—
Bar	5 @	—
Sheet	8 @	—
Pipe	7 @	—
Shot, discount 10% on 500 bags Drop, ₩ bag.	1 45 @	—
Buck, ₩ bag	1 65 @	—
Chilled, do	1 85 @	—
STEEL—English, lb	16 @	20
Canton tool	9¼@	—
Black Diamond tool	10 @	16
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4½@	—
TINPLATE—B. V., steel grade, 14x20, P. S.	4 60 @	4 65
B. V., steel grade, 14x20, spot	4 80 @	4 90
Charcoal, 14x20	6 25 @	6 75
do roofing, 14x20	5 12½@	5 25
Pig tin, spot, ₩ lb	21 @	21½
do, do, prompt shipment	— @	—
QUICKSILVER—By the flask	45 00 @	47 50
Flasks, new	— @	—
Flasks, old	35 @	—
COKE—Eng., ton, spot, in blk & sks, resptvly	20 00 @	—
Do, do, to load	13 00 @	13 25

	Spot.	To Load.
IRON—Glengarnock ton	27 00 @—	27½@ —
Eglinton, ton	26 00 @—	26½@ —
American Soft, No. 1, ton	— @31 00	31½@ —
Oregon Pig, ton	— @30 00	— @ —
Clay Lane White	— @24 50	25 @ —
Shotts, No. 1	28 50 @29 00	— @ —
Bar Iron (base price) ₩ lb	2¾@ 3	— @ —
Chrome iron ore, ₩ ton	— @10 00	— @ —

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$19 00	$16 00
41 to 50 ft	20 00	17 00
51 to 60 ft	22 00	19 00
61 to 70 ft	26 00	22 00
1x3, fencing	21 00	18 00
1x4, "	20 00	17 00
1x3, 1x4 and 1x6, odd lengths	18 00	16 00
Second quality	16 00	14 00
Selected	23 00	21 00
Clear, except for flooring	30 00	27 00
Clear for flooring	1 00	.....
Clear V. G. No. 1 flooring	5 00	.....
Firewood	13 00	9 00
Dressed Pine, flooring, No. 1, 1x6	31 00	28 00
No. 1, 1x4	33 00	29 00
No. 1, 1¼x4, 1¼x6, and odd sizes	36 00	32 00
All sizes, No. 2	26 00	23 00
Stepping, No. 1	43 00	34 00
Stepping, No. 2	33 00	24 00
Ship timber and plank, rough	26 00	17 00
Selected, planed 1 side, av'ge 40 ft	28 00	23 00
" " 2 " " "	30 00	25 00
" " 3 " " "	32 00	27 00
" " 4 " " "	34 00	29 00
Deck plank, rough, average 35 ft	34 00	31 00
Dressed, average 35 feet	39 00	34 50
Pickets, rough, B. M	19 00	15 00
½x1½, 4 ft long, ₩ M	5 50	4 00

A HUGE shovel-nose shark was caught at Catalina island, last Thursday, by a young lady who was fishing for barracuta. The ugly brute weighed 850 pounds.

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Baltimore M Co	Nevada	5	25	July 2	Aug 5	Aug 24	A R Grim, 401 Montgomery St
Baker Divide M Co	California	17	25	July 8	Aug 10	Aug 28	D M Kent, 330 Pine St
Bella Union Quicksilver M Co	Cal.	7	20	May 21	June 24	July 15	A Halsey, 328 Montgomery St
Best & Belcher M Co	Nevada	43	25	June 6	July 11	Aug 1	L Osborn, 309 Montgomery St
Crocker M Co	Arizona	7	10	Jun 14	July 19	Aug 13	A Waterman, 309 Montgomery St
Crown Point M Co	Nevada	51	50	July 9	Aug 12	Sept 3	J Newlands, 329 Pine St
Equitable Tunnel & M Co	Utah	34	5	May 14	June 20	July 15	C J Collins, 1018 Market St
Eureka Con M Co	Nevada	12	50	Jun 12	July 15	Aug 7	H P Bush, 306 Pine St
Frue Con M Co	California	6	1½	June 11	July 18	Aug 10	J C Bates, 434 California St
Gray Eagle M Co	California	13	05	May 15	July 2	July 23	Q H Bogart, 327 Pine St
Gold Point Con M Co	California	17	14	June 25	July 27	Aug 17	A B Brady, Grass Valley
Golden Fleece G'v'l M Co	California	17	00	May 21	July 20	Sept 16	W J Gleason, 806 Market St
Inyo Marble Co	California	6	5	May 14	Jun 24	July 24	G W Luce, 205 Front St
Mexican M Co	Nevada	38	25	July 9	Aug 13	Sept 3	C E Elliott, 309 Montgomery St
North Belle Isle M Co	Nevada	15	30	June 17	Aug 1	Aug 22	J W Pew, 310 Pine St
Nevada Queen M Co	Nevada	5	50	June 3	July 9	July 30	H Deas, 309 Montgomery St
Original Gold Hill M Co	Nevada	12	25	June 17	July 25	Aug 14	A W Barrows, 303 California St
Platt & Gilson G M Co	California	1	3 00	June 20	July 22	Aug 7	C Herrman, 326 Kearny St
Quartz Mountain M Co	California	21	40	Jun 17	July 22	Aug 15	E Restres, 217 Sansome St
Seg Belcher & Mides Con M Co	Nev.	3	25	June 4	July 8	July 29	E B Holmes, 309 Montgomery St
Sierra Nevada M Co	Nevada	95	25	June 7	July 11	July 31	E L Parker, 309 Montgomery St
Teirakoff M Co	California	2	10	May 18	Jun 18	July 31	W J Gurnett, 308 Pine St
Utah Con M Co	Nevada	7	25	July 9	Aug 13	Aug 30	A H Fish, 309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING	DATE
Del Monte M Co	Nevada	J W Pew	310 Pine St	Special	July 17
Live Oak Drift Gravel M Co	California	J Morizio	328 Montgomery St	Annual	Aug 20
Savage M Co	Nevada	E P Holmes	309 Montgomery St	Annual	July 18
Utah Con M Co	Utah	J M Bennington	303 California St	Annual	July 15
Yellow Jacket S M Co	Nevada	W H Blauvelt	Gold Hill	Annual	July 15

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Benton Con M Co	California	V B Allen	330 Pine St	Annual	July 31
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	May 10
Caledonia M Co	Nevada	J S Cheminant	328 Montgomery St	08	Apr 26
North Star M Co	California	D A Jennings	401 California St	50	Dec 31
Navajo M Co	California	J W Pew	310 Pine St	10	Apr 1
Idaho M Co	California		Grass Valley	7.50	Mar 5
Pacific Borax, Salt & Soda Co	California	A H Clough	230 Montgomery St	1.00	Mar 11

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	$ 6 75 @ 7 00	Cardiff	9 50@10 00
Liverpool St'm	7 25 @ 7 50	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	8 00 @ 8 50	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Gilman	6 00
Scotch Splint	8 00	Seattle	6 00
West Hartley	9 50	Coos Bay	5 00
Greta	8 00	Cannel	10 00
Westminster Brymbo	8 00	Egg, hard	17 50
Nanaimo	9 00	Cumberland, in sacks	19 00
Sydney	$ 8 00	do, bulk	18 00

Mining Share Market.

The bears here, like Sullivan at the East, have had things their own way, and each time the bulls came "to time" it has only been to be again knocked out. The bulls claim that the prices for Comstock shares are getting so low they offer inducements to those cash buyers who hold until they get a good profit, even if they have to pay two or more assessments before realizing. The bears still claim that it will take time to get the mines into position so as to make much of an upward move in stocks, and until the situation in the mines is more promising there can not be more than from 50 to 100 per cent, if that, in sight for buyers, and that in risking money in the venture those buying run chances of having to submit to still lower prices.

The bulls claim that never before has so much work been done at any one time than is now being done in the leading mines, and as much of the work is being done in promising quarters, ore is liable to be run into at any time and an upheaval in values follow. They also claim that the bear raids have been engineered by the pool to get in more stock, and in this op nion they think they are confirmed by the large number of assessments that are being levied. They contend that the talk is now all down and no ore, while a few months ago it was all up and plenty of ore in sight and water for motor-power. The decline in the values of the Comstock shares the past week has been from 20 to 30 per cent, with a weak tone ru ing to-day at yesterday's slight advance. Occidental is the only strong stock on the list. Its strength is due to a report that the mill will soon be ready to start up. It is a question whether the ore can be milled yet, for it is quite rebellious. In outside stocks the Tuscaroras are very strong. The move, it is claimed, is being engineered so as to work off stock at a slightly higher range of values, for so far there is nothing in the mines to justify much of a move. Eureka Con. is weak, doubtless owing to the loss of the mill, etc., by fire, and also that a 50-cent assessment is about delinquent. The Quijatoas have been barely steady. There are fewer points out on these stocks, but then trading in them is light. There are bear points still on the Bodies. Doubtless this is one cause of Bodie and Mono going down in sympathy with the Comstocks, but now the low prices put out on the street are about reached.

The news from the mines is about as follows: From the Comstocks, it is reported that the Nevada mill has shut down owing to scarcity of water, as have the other mills that are depending on water-power. The California Pan Mill, Brunswick, and Eureka, are being run by steam. The first and last named are running on Con. Virginia ore, while the other is running on Yellow Jacket ore. On the 1950-foot level, to the extreme west in Con. Virginia, near the Ophir line, a rich vein of ore was struck. It was followed for a distance of about 50 feet when it showed a width of three feet. At this distance a winze was sunk on it to a depth of 12 feet, when the ledge showed a width of seven feet of very rich ore. Further than this we are not advised. In Crown Point more men have been put to work, which probably means the taking out of ore or else more interesting prospecting work. The work going on in Confidence, Challenge, Belcher, and two or three more of the Gold Hill mines is being closely watched. As far as that is concerned, the work going on in all the mines is being closely watched. From the Quijatoa district better news is looked for at an early day, while from the Tuscarora district there is always good news, yet only the inside is supposed to benefit by it. From the Bodies we are unable to obtain thoroughly reliable news. There is a rumor on the street, which we give for what it is worth, that the bulkhead in Bodie is completed, and the water referred to by Superintendent Kelly in his annual report, will soon be, if it is not already, under control. It is also rumored that the work going on in the mine is of a very promising character. So far as that is concerned, nearly everything now-a-days appears to be promise(ing).

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, term of subscription, and give it their own patronage, and as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING June 19.		WEEK ENDING June 26.		WEEK ENDING July 2.		WEEK ENDING July 10.	
Alpha	1.10	1.45	1.10	1.25	1.15	1.25	1.00	1.20
Alta	1.25	1.35	1.30	1.60	1.40	1.45	1.20	1.30
Andes	.30	.55	.35	.50	.45	.55	.40	.40
Argenta	....	....	....	....	....	....	....	....
Belcher	2.60	3.50	2.75	3.40	2.80	3.40	2.65	3.15
Best & Belcher	2.50	3.25	2.50	3.20	2.90	3.60	2.85	3.40
Bullion	.60	.70	.60	.70	.65	.70	.60	.65
Baltimore	....	....	....	....	....	....	....	....
Belle Isle	....	.20	....	.20	....	.20	....	....
Bodie Con	1.20	1.35	1.25	1.40	1.30	1.35	1.10	1.20
Benton	....	3.85	4.00	4.50	....	....	4.00	....
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	....	.30	....	.30	.30	.35	.30	.35
Commonwealth	4.25	4.50	4.00	4.30	4.05	4.20	3.85	4.10
Con. Va. & Cal	6⅝	7⅜	6⅝	7¼	7⅜	7⅝	7¼	7⅝
Challenge	1.75	2.20	1.80	2.35	1.85	2.30	1.75	....
Cholla	1.50	2.00	1.50	1.75	1.60	1.80	1.45	1.60
Confidence	.5	6	5⅛	6	....	6.00	5⅛	5⅛
Con. Imperial	.35	.40	.35	.45	.40	.45	.40	.45
Caledonia	.20	.25	.20	....	....	....	.20	....
Con. Pacific	....	....	....	....	....	....	....	....
Crown Point	2.25	3.10	2.25	2.75	2.40	2.75	2.00	2.55
Crocker	....	.30	.20	.30	.25	.30	.25	.30
Central	....	....	....	....	....	....	....	....
Dudley	....	....	....	....	....	....	....	....
East B. & B	....	....	....	....	....	....	....	....
Eureka Con	....	....	....	....	....	....	....	....
Exchequer	.60	.70	.50	.70	.60	.70	.60	.65
Grand Prize	.70	.80	.70	.75	.65	.75	....	.70
Gould & Curry	1.75	2.35	1.75	2.30	2.05	2.40	1.80	2.10
Hale & Norcross	3.50	3.70	3.00	3.45	3.30	3.45	2.90	3.10
Holmes	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Iowa	....	....	....	....	....	....	....	....
Julia	....	.20	.20	....	.25	.30	.25	.30
Justice	1.15	1.25	1.10	1.45	....	1.40	1.15	1.35
Kentuck	1.05	1.15	1.05	1.30	1.15	1.20	1.00	1.25
Lady Wash	....	.35	.35	.40	....	.40	....	....
Locomotive	....	....	....	....	....	....	....	....
Martin White	....	....	....	....	....	....	....	....
Mexico	.95	1.10	1.00	1.05	1.00	1.10	.75	....
Mexican	2.70	3.40	2.70	3.25	3.00	3.90	2.75	3.40
Mt. Diablo	....	....	....	....	....	....	....	....
Navajo	....	....	....	....	....	....	....	....
North Belle Isle	1.00	1.10	.95	1.10	.80	.95	1.05	1.25
Niagara	....	....	....	....	....	....	....	....
Nev. Queen	.80	.90	.55	1.10	.80	.95	1.30	1.45
North G. & O	....	....	....	....	....	....	....	....
Occidental	1.25	1.40	1.35	1.50	1.40	1.60	1.50	1.70
Ophir	4.00	4.75	4.05	4.75	4.35	5⅛	4.30	5⅛
Overman	.95	1.35	1.05	1.15	1.10	1.15	1.00	1.05
Potosi	1.50	1.95	1.45	1.70	1.50	1.70	1.45	1.65
Peerless	.25	.40	.25	.45	.35	.40	.40	....
Peer	.15	.20	.15	.25	.20	.25	....	....
P. Sheridan	....	....	....	....	....	....	....	....
Silver Star	....	....	....	....	....	....	....	....
Savage	1.80	2.30	1.80	2.15	1.90	2.15	1.65	1.85
S. B. & M	1.50	2.60	1.50	1.95	1.70	1.90	1.95	2.15
Sierra Nevada	1.75	2.35	1.75	2.25	2.95	2.45	2.15	2.55
Silver Hill	.40	.45	.40	.45	.40	.45	.40	....
Silver King	....	....	....	....	....	....	....	....
Scorpion	.15	.20	.15	.20	.20	.25	.20	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	....	....	....	....
Union Con	2.75	3.40	2.75	3.15	2.90	3.5	2.80	3.25
Sierra Nevada	.80	.95	.80	1.00	.90	1.05	.70	.90
Yellow Jacket	2.70	3.15	2.70	3.15	2.85	3.25	2.75	3.00
	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

TUESDAY, July 3, 9:30 A. M.

100	Alpha	1.20	
120	Andes	40c	
300	Baltimore	10c	
100	Belcher	2.80	
50	B. & Belcher	3.05	
50	Benton	3.00	
220	Chollar	1.60	
130	Confidence	5.50	
100	Crocker	25c	
50	Crown Point	2.20	
100	Con. Imperial	40c	
110	Con Va & Cal	7.50	
300	Gould & Curry	1.95	
100	Hale & Nor	3.00	
100	Lady Wash	30c	
280	Mexican	2.95	
100	N. Belle Is	1.05	
300	Occident	1.75	
130	Overman	95c	
720	Ophir	4 55	
100	Peerless	35c	
450	Savage	1.70	
100	Sierra Nevada	2.35	
200	Scorpion	20c	
400	Silver King	85c	
10	Union	2.95	
150	W Comstock	35c	
150	Yellow Jacket	2.90	

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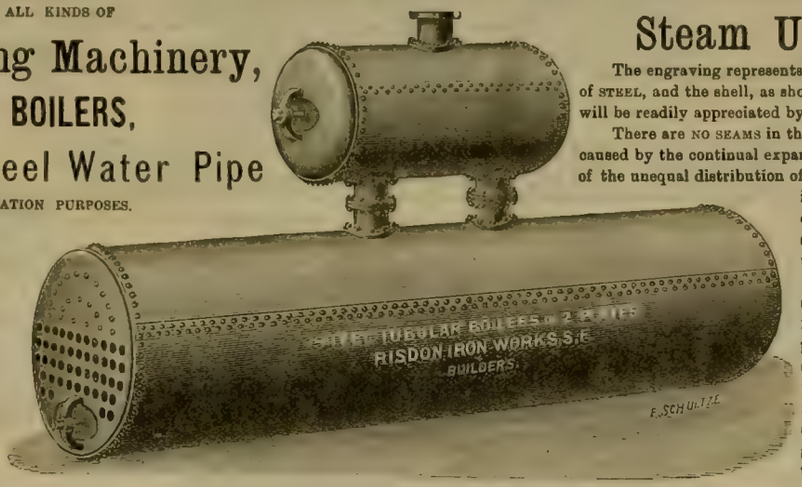
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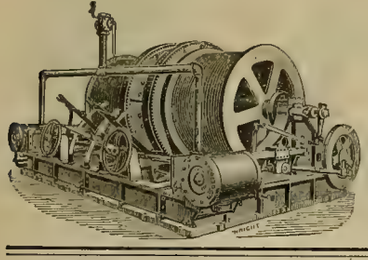
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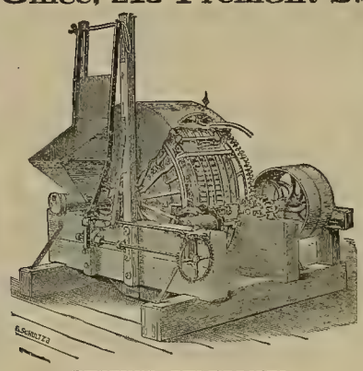
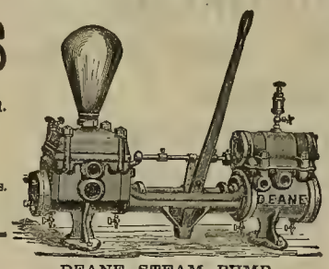
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WORKS ORE WET OR DRY.
ENGINES AND BOILERS
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Either for use on Steamboats or for use on Land.
Water Pipe, Pump or Air Columns, Fish Tanks for Salmon Canneries
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Agents and Manufacturers of the Llewellyn Feed Water Purifier and Heater.

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Of Different Strengths as Required.
NOBEL'S EXPLOSIVE GELATINE," which contains **94 per cent of Nitro-Glycerine,** and **GELATINE-DYNAMITE, Stronger than Dynamite** and even Safer in Handling.
JUDSON POWDER IMPROVED.
FOR RAILROADS AND LAND CLEARING. Is from three to four times stronger than ordinary Blasting Powder, and is used by all the Railroads and Gravel Claims, as it breaks more ground, pulverizes better and saves time and money. It is as dry as the ordinary Blasting Powder and runs as freely.
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Zinc, Copper or Brass Screens for all purposes. California Perforating Screen Co., 145 & 147 Beale St., S. F.

COAL MINES OF THE WESTERN COAST.
A few copies of this work, the only one ever published treating of Pacific Coast Coal Mining, have been obtained, and are for sale at this office for $2.50 per copy. It was written by W. A. Goodyear, Mining and Civil Engineer, formerly of the California State Geological Survey.

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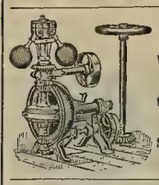
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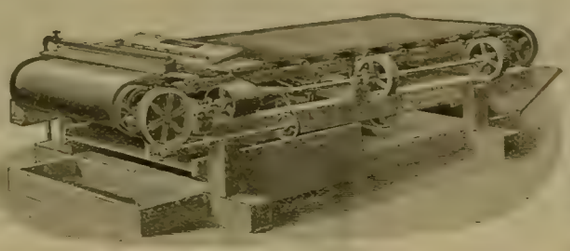
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IMPROVED BELT FRUE ORE CONCENTRATOR,

The Best Ore Concentrator in the market, having double the Capacity and doing its work as close as the plain Belt machine, while its concentrations are clean. It is used in a number of Mills, the most notable of which is the Alaska M. & M. Co's Mill, where 24 Improved Belt Frues are taking the Pulp from 120 Stamps, crushing 350 tons per day, and is giving entire satisfaction as against 48 plain Belt Machines, taking the Pulp from the other 120 Stamps.

Price of Improved Belt Frue Vanner, $900, f. o. b.
Price of Plain Belt Frue Vanner, $575, f. o. b.

For Pamphlets, Testimonials and further information, apply at office.



Protected by Patents December 22, 1874; September 2, 1879; April 27, 1880; March 22, 1881; February 20, 1883; September 18, 1883; July 24, 1888. Patents applied for.

There are Over 2200 Plain Belt Machines now in Use.

THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., Room 15, No. 132 Market Street, San Francisco, Cal.

"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

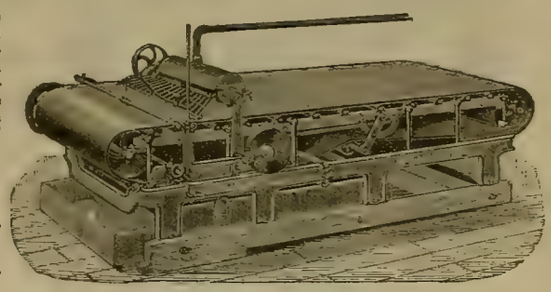
The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

—o—

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - - $650 f. o. b.
Price "Triumph" Concentrators, with Plain Belt - - - - - - - $550 f. o. b.

—o—

We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need be.
Circulars and testimonial letters furnished on application.



JOSHUA HENDY MACHINE WORKS,
39 to 51 Fremont Street, San Francisco, Cal.

(PATENTED.)

Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

—o—

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vann or concentrating devices. DAVID McKAY, JR.,
[Signed] Sup't North Star and Original Empire Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

PACIFIC IRON WORKS

1850. 1888.

—BUILDERS OF—

MINING MACHINERY.

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We are also prepared to CONSTRUCT and DELIVER in COMPLETE RUNNING ORDER, in any locality, MILLS, CONCENTRATION WORKS, WATER JACKET SMELTING FURNACES, HOISTING WORKS, PUMPING MACHINERY, ETC., ETC., of any DESIRED CAPACITY.

THE GATES CRUSHER

Is beyond all question the most important improvement that has ever been made in this class of mining machinery. It will do more than twice the work with a given amount of wear than any other Crusher made, besides crushing so much finer that for mining uses, the capacity of the mill is greatly increased. It has the same relative superiority for macadamizing purposes, affording the cheapest and most reliable machine for this use.

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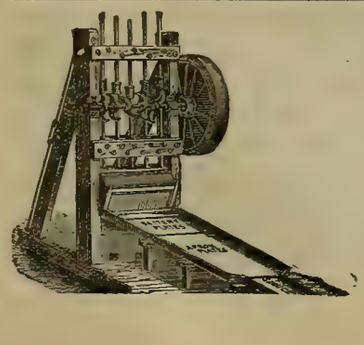
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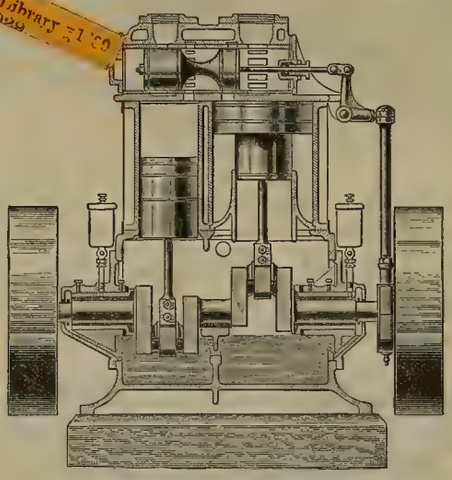
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GREATEST CAPACITY
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One Machine Taking Pulp from 10 Stamps.



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SALES DURING LAST FOUR MONTHS:

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Grand Total, 309 Engines, Aggregating 13,975 Horse Power.

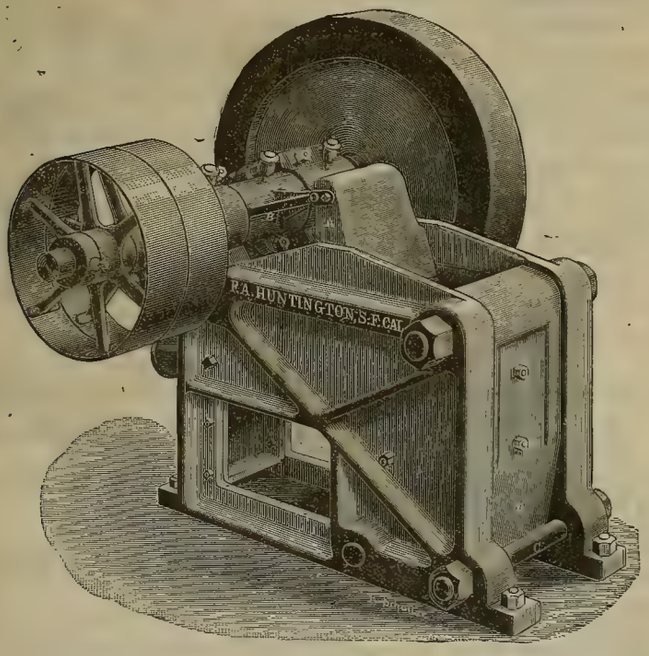
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STEAM ENGINES AND MINING MACHINERY OF EVERY DESCRIPTION.

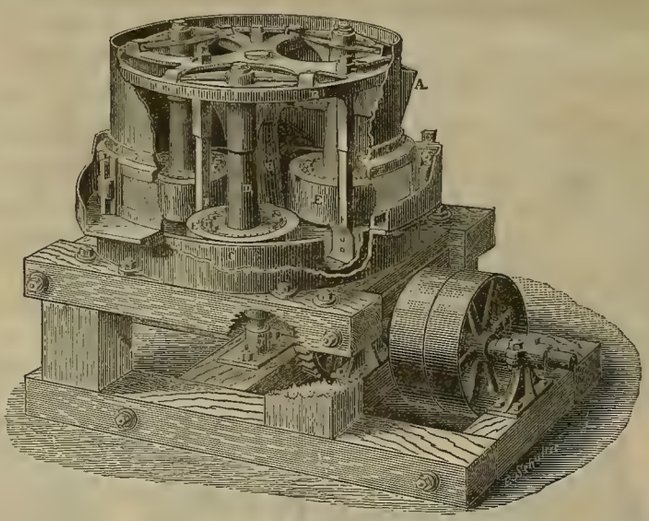
PRINCIPAL OFFICE, 45 FREMONT STREET, SAN FRANCISCO.



Huntington's Improved Rock-Breaker.

The main features of this machine are strength, ease of adjustment and simplicity of construction.

The movable jaw *A* is worked by the eccentric *B* and is pivoted at the bottom. The stationary jaw *D* is secured at the top by a bolt running through it, and at the bottom bears against the heavy bolt *C*. The main wear is, of course, at the bottom of a breaker of this form, and the wear is easily taken up by inserting a plate between the bolt *C* and the jaw *D*. The jaw is thus swung in at the bottom, and the opening where the ore passes through is made correspondingly smaller. As will be seen by the cut, this machine is of very simple construction and is strong and durable.



F. A. HUNTINGTON'S Centrifugal Roller Quartz Mill.

The following will explain the above cut:

The ore and water being fed into the mill at the hopper *A*, the rotating rollers and scrapers throw the ore against the ring die, where it is crushed to any desired fineness by the centrifugal force of the rollers as they roll over it.

The water and pulverized ore are thrown against and through the screens when fine enough. The discharge is so perfect that it makes little or no slimes, and leaves the pulp in good condition for concentration. The rollers are suspended, leaving a space of one inch between them and the bottom of the mill, thus allowing them to pass freely over the quicksilver and amalgam without grinding it or throwing it from the mill, while it agitates it sufficiently to make amalgamation perfect. For wet crushing and gold saving it has no equal.

I claim especial merit in that feature of this system *which prevents* ALL FLOURING of gold and quicksilver, and the consequent loss of gold that attends stamp milling.

For the economical working of ore that contains sulphurets, I particularly claim the adaption of this mill. The rotary method of crushing the ore so granulates the pulp (which is discharged the moment it is crushed) that a complete concentration of sulphurets is rendered most easy.

Sargeant Rock Drills For Sale.

The undersigned, having seven new 3-inch Sargeant Drills, complete with clamps and columns and three extra tripods, more than they can make use of, will sell all or any one, delivered in San Francisco at much below cost, the price depending on the number ordered.

ILEX GOLD MINING CO., Limited.
R. W. Petre, Agent.

Rich Gulch, April 27, 1889.

CITY HOTEL.

Sonora, - - - - - - Tuolumne Co., Cal.

HEADQUARTERS FOR MINING AND TRAVELING MEN.

Office of all Stage Lines leading out of Sonora. Fine Bar, Billiard, Reading and Sample Rooms. Everything first-class. Terms reasonable. C. S. FITCH, Proprietor.

Smelter For Sale or Exchange.

One 50-ton, wrought iron, water-jacket Smelting Furnace (36"x60" at the tuyeres) of the latest design, with Crusher, Blower, Boiler, Pumps, Engines, Tools, and everything complete for immediate delivery, and only used about six months. Cheap for cash, or will exchange for interest in a Lead-Silver Mine, or erect in any mining camp that will guarantee a certain output. For further particulars address Box 28, Elkhorn, Montana.

MINING AND SCIENTIFIC PRESS.

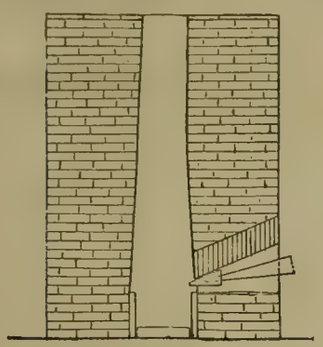
An Illustrated Journal of Mining, Popular Science and General News.

TWENTY-PAGE EDITION.

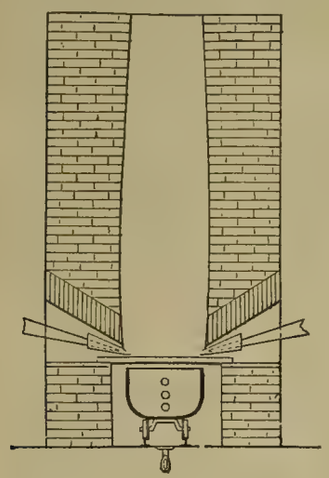
VOL. LIX.—Number 3.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, JULY 20, 1889.

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Single Copies, 10 Cts.



OLD BLOOMARY, USED BEFORE 1875.



HUSGAFVEL FURNACE OF 1875.

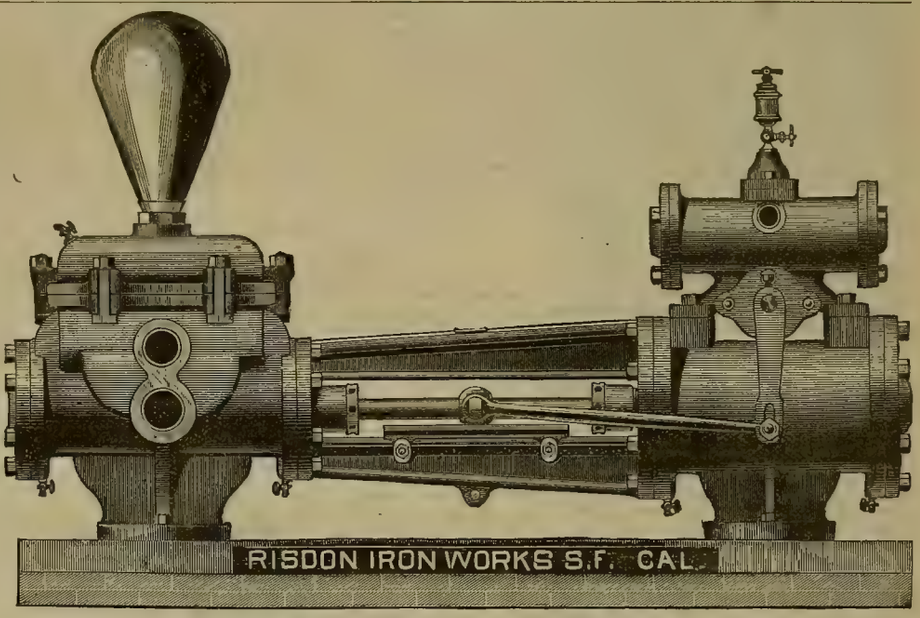
(See page 48)

Slime Concentrator.

Miles B. Dodge of this city has just patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, a machine for concentrating slimes, which is shown in an engraving on this page. The slimes from sizing-boxes are taken on to the machine through the trough *a*, into the settling-box *b*. At the bottom of the settling-box is a small pipe to take all the slimes that will settle with just the required amount of water for the good working of the machine. The surplus water flows over the top of the settling-box at each side into a second settling-box *c*, where any slimes that might be still held in suspension will settle and flow out of the small pipe *e*, the water still remaining flowing out through the rubber hose *f*, into the tailing sluice *p*.

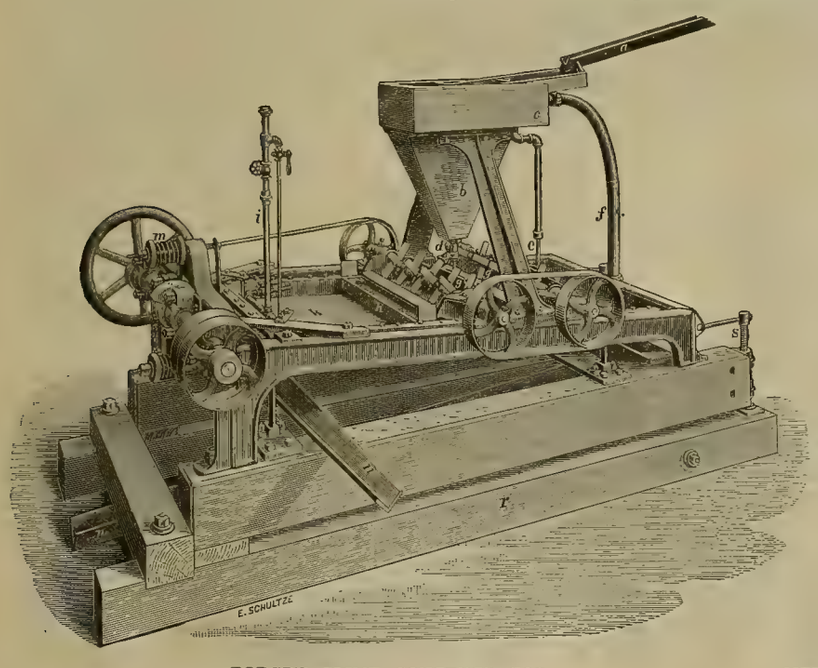
It will be seen by this operation that all matter in suspension will settle and leave the surplus water to flow off without coming on to the bed of the machine. In fact, this represents in action the old German rapping tub for settling slimes.

The slimes after being settled out of the surplus water into the spreaders *gg*, from the settling-boxes, are spread evenly across the concentrating bed *k*. The revolving shaft with cam *o*, moves the concentrating bed gently forward, the springs *mm* bringing it suddenly back, striking on buffers which send the gangue and mineral toward the upper end of the machine, where water is turned on in just the most delicate proportion to separate the gangue from the mineral through pipe *i*, having cross pipes with small holes. The water striking the head of the machine, flows gently down the table, separating the gangue from the mineral and carrying the gangue over and off the lower end into the tailing sluice *p*. The mineral passes up toward the head of the machine into a depression which has a raised pipe in it, through which the mineral escapes with water enough to carry it down the small spout *n*, into any kind of receptacle that may be provided. The finest slimes that will not travel against a current of water will settle in a depression at the lower end of the concentrating table, to be removed when it fills up. The machine is regulated by the inclination given with the hand-screws *ss*, and by the amount of water turned on through pipe *i*, and the tension of the springs *mm*. This slime concentrator is sold by Parke & Lacy Co., 21 and 23 Fremont street.

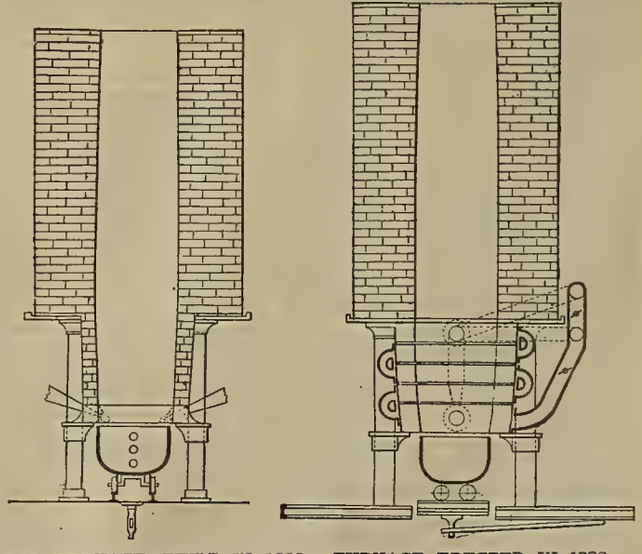


THE DAVIDSON STEAM PUMP.—(See page 53.)

THE Santa Cruz *Sentinel* of Sunday says: Chief Engineer Schussler of the Spring Valley Water Works will to-morrow commence the survey of a route from Laguna creek to this city for the line on which will be laid the main pipe for conducting the waters to the storage reservoirs to be built in Santa Cruz.



DODGE'S SLIME CONCENTRATOR.



MPROVED FURNACE, BUILT IN 1880. FURNACE ERECTED IN 1882.

See page 48.)

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

The Northern Counties of California.

[NUMBER 6.]

Gold Bluff Beach Mines.

[Written for the PRESS by JAMES H. CROSSMAN.]

Still another evidence of the magnitude and importance of this ancient river system can be seen at Gold Bluff, Humboldt county, latitude 41 north, and longitude 124 west from Greenwich. Here a dead river 6½ miles wide from bank to bank has discharged its contents into the Pacific ocean. This river of the system previously described must have taken a circuitous route to find the great "father of waters." In the absence of a geological survey and accurate maps, it is difficult to trace its true course, though to all appearances it flowed from a northwesterly direction, as gravel can be traced on the surface for 15 miles or more southeasterly from its mouth in the direction of the confluence of the Trinity river with the Klamath at the big bend of the latter. In all probability this dead river formed at some remote period in the earth's history the bed of what is now known as the Klamath river, diverging from it at a point near "the big bend."

The Klamath, though now but an insignificant torrential stream, if we can judge from the numerous side dead river channels that rise from the present river-bed in terrace form on its bank, must have been at some time an immense river, quite large enough to move and carry the enormous amount of alluvions found at Gold Bluff; but this is hypothetical and requires a skilled engineer with a trained corps of assistants to determine. Whatever the course or origin of this ancient river may have been, there can be no question as to its character.

A Cross-Section of its Channel,

Exposed by the erosive action of the elements and wave power of the Pacific ocean, shows a well-defined trough of a river-bed measuring from rim to rim 34,320 feet. The rocky banks on either side rise from the ocean level with a gradual and regular slope to a considerable elevation, the northerly the most abrupt, the southerly at a lesser angle of inclination. Both are overlaid on their slopes by alternate strata of alluvions gravel, pipe clay, gravel, sandstone, gravel, cement, etc., in regular order and of varying thickness, dipping into the basin-shape depression until reaching a point near the center, where the upper strata assumes a horizontal position for a considerable distance. This denotes the former existence of a strong current and deep water in the channel's center. The rim rocks of the channel have, from denudation and atmospheric influences, been more rapidly degraded than the gravelly contents of the channel. The latter at one point shows an elevation of 926 feet of solid gravel and river wash (above the ocean level), with nearly vertical cliffs or escarpments varying from 40 to 618 feet in hight, cut and exposed longitudinally for considerable distances by water-courses. This stratum, as it lays on and above the rim rock, if projected on the same angle of inclination downward below the ocean level, would indicate a depth of gravel of 2700 feet, to which add the fluviatile material seen above, and we have 3636 feet of auriferous material—the strata are composed of the same material and are of the same character as that found in the pliocene channels of the most noted hydraulic mines of our State. The metallic and mineralized products are the same, and fossil and carbonized woods are not wanting; gold osmioridium, precious stones, etc., are also found. The undoubted evidence of the existence of river wash at so great a depth

Below the Ocean Level

Indicates a gradual but slow subsidence of the earth's crust through long periods of time.

There are also indications that the mouth of this Amazonian river at one time extended much farther out into what is now the ocean than at present, as evidenced by the sharp, rocky projections that once formed the rim of the channel appearing in their appropriate places above the ocean level. The present headlands and crescent-shape formation of the bluffs represents the mouth of the river that was.

The enormous mass of fluviatile material that filled the frontage of this channel has, in process of time, been degraded by atmospheric influences and hydraulic agencies which are and ever have been at work tearing down and building up. In this instance the waves of the ocean, assisted by atmospheric influences, have been the destroying element. The erosive power of water in motion is great; its impact, as it impinges on any obstruction, rocky bluff, or gravelly bank, equals in a moderate swell 611 pounds to the square foot; in an ordinary storm, 2,086 pounds; and when lashed into fury by a severe gale or hurricane the blow equals 6000 pounds; hence the result.

During the Periodical Storms

Of the winter months volumes of water are dashed against these beetling, gravelly cliffs, with an irresistible force accompanied by a deafening report, undermining and shattering the mass until the projecting and overhanging cliffs can no longer sustain their weight. Their cohesive power exhausted, thousands of tons are detached, cave and fall and seek the ocean level. The incoming wave destroys its integrity and further pulverizes the mass; the receding wave, with its undertow, carries the earthy and lighter material seaward, leaving but a small portion of its metallic contents on the gently sloping sandy beach, gilding its surface with a golden sheen.

This has been the result of the operations of Dame Nature's Big Giant and hydraulic apparatus. It is this that has given pith and moment to that industry known as the

Gold Bluff Beach Washings,

Inaugurated in 1851 by General James Wilson, and worked successfully with a primitive process by him and his successors in interest to date with an output in excess of $1,000,000 in gold values, which has contributed to the circulating medium of the world. Recently a new element has appeared to destroy the integrity of this mountain of auriferous gravel—man with his "Little Giant," using water under a powerful pressure head, has also commenced the work of destruction.

A son of Edson Adams (deceased) is now working the property known as the Pioneer claim—a portion of Gold Bluff—by the hydraulic process with marked success. The gravels of this channel have proved to be remarkably rich. With the Pacific ocean for a dumping-ground, and no disgruntled or belligerent anti-debrisities to object, no federal or State court to enjoin, and gravel enough in sight to build and ballast a railroad to China, with a sufficiency of the precious metal in the gravel to pay the national debts of the world, his success seems to be assured.

The Bluff proper, which comprises the mouth of this dead river, contains in its frontage on the Pacific ocean two claims, known as the "Pioneer" and the "Union"; the former is owned by the estate of Edson Adams; the latter by Chapman & Co. of Arcata, Humboldt Co.

The Tuolumne County Mines.

Soulsbyville.

EDITORS PRESS:—Soulsbyville is one of the most prosperous mining districts in the State, and contains more paying mines for its area than any other camp I know of, although the formation is granite (gray) and gneiss or foliated granite. The old Soulsby mine has produced its millions of dollars during the past 35 years, and I have good reason to believe, and know, that with capital to develop the rich chutes to further depths, and to explore the unopened portions of the old mine, millions may yet be extracted. The old mine has not been allowed to decay, but is kept in working order. Powerful pumps are kept running under water-power, and everything done by Mr. Wm. Sharwood, the owner, to preserve the property. Although the ground is hard, it is a cheap mine to work, notwithstanding the contrary being said, for the mine requires little or no *timber* to keep it open. This is the main cost in all mining operations, the latter having to be so often renewed from decay and pressure. Lastly, the risk of fire getting into old mines, that are closely timbered, is a fearful cost when necessity demands its use and renewal. In the case of the old Soulsby, timber is not needed to any extent except for platforms, stations and the like.

The mine is opened to a vertical depth of over 600 feet, and eight levels with almost miles of drifts, crosscuts and tunnels. The vein is not large, but of high grade; value, from $20 to $60 per ton. In places the lode has produced several hundreds per ton, and, as I said before, capital is only needed to make this once-famous mine boom again.

Next to this mine is the Platt and Gibson mine south. They have expended considerable money in hoisting works and mill. The owners are perfectly satisfied with their outlook and are slowly and surely developing their property to the best advantage, with a safe result in the future of a dividend-paying mine. It is the south extension of the Soulsbyville vein.

Proceeding back north on the west side of the Soulsby mine we find the Wheal Perrin. This is an exceedingly rich mine, so far as opened. The south shaft, 128 feet in depth, sunk on the vein (which is nearly vertical 80° slightly dipping to east strikes nearly north and south it parallels the Soulsby) is opened by drift and stope (north). Gold can be seen along the entire workings. The ore has paid in mill $64 to $70 per ton. But the great richness is found in the base metals, which consist of galena, zinc, blende and chalcopyrite. The richest base is a peculiar pyrite, of green color, in uniform masses of acicular crystals. No gold can be seen in them, as extracted from the mine, but I have worked several pounds of this class of sulphurets up to $2000 per ton (or at the rate of); these are facts. The vein is small in places and pinches when the walls make a bend or turn, but will average eight inches in places at the bottom of south shaft. The rock will work 50 cents a pound in free gold. The whole of the soft, decomposed vein to 30 feet from grass paid $30 per ton. At that depth the vein enters the hard granite and is pinched from 2 feet to 8 to 18 inches in width; in places on a turn of the walls to 4 inches. The chute is 200 feet long, as developments show. The vein is seated in gneiss, and gold can be seen in this black granite, the quartz being frozen to the slating in places. The value or what is asked for the property is in sight, and can be easily extracted. This is a very safe computation; 200 feet from No. 1 or south shaft is No. 2 north sunk only 30 feet, and the interim space between the two shafts yielded $30 per ton. Hence the distance of the length of chute was determined, viz., 200 feet.

The mine is held under United States mineral patent, title perfect. I may here state, there is no mine in this section that I would rather own than the Wheal Perrin, for a safe and sure investment. At first sight it does not impress the stranger. A man must be almost educated to the knowledge of this very peculiar ore. I will guarantee the oftener the expert tries, assays, and works the rock, the more he will be satisfied with its great value. It is a cheap mine to work, with the right kind of men at its head. He or they must have a good sound metallurgical and mineralogical knowledge to successfully treat its ore. There is no great difficulty in the way to such a man; his success will be triumphant. It is like the Soulsby mine in this respect, but little timber is required. Of course, the granite is hard to drill, but blasts kindly. A small stope is only needed to extract the vein, and being nearly *vertical*, a small stope can be easily worked with a few stull pieces to carry staging.

Next south to the W. P. is the Churchill, also a mine of merit, but which has been neglected of late. Here is a good chance for anyone desiring a cheap mine on this line, being on the same vein as Wheal Perrin, also a parallel to the Soulsby vein.

Still further south, on the same line, are found the Black Oak, Carrie, and Live Oak. The Black Oak is steadily working with a large force of men, and their ten-stamp mill pounding away on 30 to 40 dollar rock, besides their concentrates from their Frue vanners, running up into the hundreds per ton. The vein averages two feet and in places five feet. They are working most systematically, and own a magnificent property. The Carrie mine shows the same high-grade ore, as well as the Live Oak adjoining. Time will surely develop these other mines, equal to their neighbor, the Black Oak.

Still further to the west another parallel is found in a vein known as the Drapery mine. It has been stoped from water level to the surface. The rock averaged $70 per ton. It is now bonded, awaiting new owners, who will energetically open up its riches. A great amount of money was taken out of this mine, and its future is assured, for the last rock milled paid handsomely. Litigation caused its closing down. ARGUS.

In the Blue Mountains, Oregon.

EDITORS PRESS:—Thinking some mining items might interest the readers of the PRESS, I thought I would send you a few. This place is situated on a tributary stream to the middle fork of the John Day river, in one of the best mining regions of the Blue mountains. The ore of the camp is all free-milling, but after depth is attained and the water level is struck the ore becomes sulphureted. After the depth of 75 or 80 feet the free gold disappears. The sulphurets are immensely rich. Out of four assays at the U. S. assay office at Boise City, Idaho, the net returns were 27 ounces in gold and 15 ounces in silver per ton. The ledges are large and well defined. The formation is talc-slate. The country is finely situated for a mining region, but if they do not start in pretty soon and commence to take out some money, I am afraid the community will commence to lose confidence in the Blue Mountain range as a mineral-producing country. PHIL. REILLY.

Susville, Grant, Oregon.

The Montezuma Wells.

Probably one of the most interesting relics of the prehistoric race that densely populated central Arizona is the Montezuma wells, on Beaver creek, 13 miles northeast of Camp Verde. The buried cities and ruins of the Salt River valley are of more interest to the historian and day-dreamer, but they scarcely equal, in testimony, the large quantities of broken pottery that mark the sites of our populous districts on the mesas 10 or 15 miles beyond the water carried by the most advanced of our modern irrigating ditches. But the Montezuma wells call for less exertion of imagination. An almost circular hill that would not cover a 40-acre field rises to the hight of about 100 feet on the north bank of Beaver creek. At the top is a perfectly round hole, probably 300 feet in diameter, with perpendicular walls of about 50 feet that descend to a body of clear water that assumes a black hue as you look down into its unfathomable depths—absolutely unfathomable, because bubbles come up for an hour from descending stones that visitors throw into its depths. An opening, whether artificial or natural is unknown, permits the surplus water to run out under a natural bridge 40 feet wide into the creek or a modern irrigating ditch which a utilitarian has led over a lovely little homestead, thus securing an unvarying water supply. In the perpendicular walls are houses of stone built by that mysterious people of whose history we know nothing, that prehistoric race that has left no posterity. On the top of the bridge between the wells and the crater are remains of demolished forts or houses of more massive structure than those that indent the walls. The wells are of volcanic origin and the water is a trifle warm. There are probably hundreds—perhaps thousands—of square miles in a body in Arizona in the great unknown region beyond the grand canyon upon which no white man has set foot. What are its mysteries?—*Phœnix Herald.*

Mineral Products of the United States.

The sixth report on "The Mineral Resources of the United States," by David T. Day, Chief of the Division of Mining Statistics and Technology, United States Geological Survey, is to be issued shortly. This report is for the calendar year 1888, and contains detailed statistics for this period, and also for preceding years, together with much descriptive and technical matter. The following are the totals of the production of the more important mineral substances in 1888:

Metals.

Iron and Steel.—The principal statistics for 1888 were: Domestic iron ore consumed, about 12,060,000 long tons; value at mines, $28,944,000. This is an increase over 1887 in quantity of 760,000 tons, but a decrease in value of $4,956,000. Imported iron ore consumed, 587,470 long tons; total iron ore consumed in 1888, about 12,650,000 long tons, or 150,000 tons more than in 1887. Pig iron made in 1888, 6,489,738 long tons; value at furnace, $107,000,000. This is an increase over 1887 of 72,590 tons in quantity, but a decrease of $14,925,800 in value. Steel of all kinds produced in 1888, 2,899,440 long tons; value at works, $89,000,000. This is a decrease from 1887 of 439,631 tons in quantity and of $14,811,000 in value. Total spot value of all iron and steel made in 1888, in the first stage of manufacture, excluding all duplications, $145,000,000, a decrease of $26,103,000 as compared with 1887. Limestone used as a flux in the manufacture of pig iron in 1888, about 5,438,000 long tons; value at quarry, about $2,719,000.

Gold and Silver.—According to the Director of the Mint, the gold product was 1,604,927 fine ounces, valued at $33,175,000. This is about the same as in 1887, being an excess of only $75,000. The silver product was 45,783,632 fine ounces, of the commercial value of about $43,000,000, and of the coining value of $59,195,000. This is an increase of 4,515,327 ounces over the product in 1887. In addition to the product of our own mines some 10,000,000 ounces of silver were extracted in the United States from foreign ores and bullion.

Copper.—The total product, including the yield of imported ores, increased to 231,270,622 pounds, or 115,635 short tons, during 1888, which is 46,053,291 pounds more than the product of 1887. During the first quarter of 1889 the production was increasing at even a more rapid rate. The prices received by American producers averaged 15½ cents per pound for Lake copper, 14½ for Arizona, and 14 for other districts, making the total value $33,833,954. Montana led in the production, making 97,897,968 pounds. Consumption was somewhat reduced by the high prices.

Lead.—The product increased to 180,555 short tons from 160,700 tons in 1887. The increase was due principally to the heavier receipts of lead in Mexican silver-lead ores from 15,000 tons in 1887 to over 27,000 tons in 1888. The average price in New York was 4 41 cents per pound. The production of white lead, chiefly from pig lead, was 89,000 short tons, valued at $10,680,000.

Zinc.—The erection of new works and the extension of old ones led to a further notable increase in the production of zinc in 1888. The additions to capacity were fairly uniformly distributed in the West, East and South. Production in 1888, 55,903 short tons, with a total value of $5,500,855; in 1887, 50,340 tons, worth $4,782,300. The production of zinc white in 1888, directly from ores, was 20,000 short tons, worth $1,600,000.

Quicksilver.—The product was 33,250 flasks (of 76½ pounds each) from California, a decline in that State of 510 flasks from 1887 in spite of a very satisfactory price, which averaged $42.50 per flask, making the total value $1,413,125. No new valuable deposits were discovered in 1888, and without them it is not probable that the yield of quicksilver will increase.

Nickel.—The industry remains unchanged except for indications of further developments at Lovelock in Nevada and Riddle, Oregon. The product includes 190,637 pounds of metallic nickel, valued at $114,382 at 60 cents per pound, and 4545 pounds, worth $1136, exported in ores and matte. Total value, $115,518. The corresponding value in 1887 was $133,200.

Cobalt Oxide.—The total product, including the contents of the exported ore and matte, was 12,266 pounds, worth $18 441. In 1887 the total was 18,340 pounds, worth $18,774, the lower rate of value in that year resulting from a larger proportion of exported nickel in matte and ore. The price of cobalt oxide remained at $2 per pound.

Chromium.—The product declined from 3000 tons in 1887 to 1500 tons in 1888. The average price in San Francisco remained $15 per ton. Increased operations are probable in 1889.

Manganese.—The product of manganese and manganiferous iron ores in the United States in 1888 was 239,460 tons, valued at $876,215. Of this amount some 25,500 tons would be classed as manganese ores; the remainder as manganiferous iron ores. Of the manganiferous iron ores 11,462 tons, averaging 11 per cent of manganese, and 189,544 tons, averaging four per cent of manganese, were from the Colby mine, Michigan. In addition to the above, some 60,000 tons of argentiferous manganese ores, valved at $10 a ton, chiefly for the silver contained in them, were produced in the Rocky mountain region.

Aluminum.—The past year was more promising than ever before for the production of

cheap aluminum. The production of metallic aluminum as an industry distinct from the production of alloys began toward the close of the year, and 500 pounds had been made up to December 31; the production of 3000 pounds since then indicates that the industry may continue. The exact amount of alloys produced by the Cowles process has not been furnished, but was not markedly different from the product of 1887, when 18,000 pounds of aluminum contained in bronze and ferro aluminum were produced. The price for metallic aluminum declined to as low as $4.50 per pound for less favored brands.

Platinum. — Including the platinum and ridium separated from gold by the assay offices and that saved in placer gold mining, the product was about 500 ounces, valued at $2000.

Fuels.

Coal.—The total production of all kinds of commercial coal in 1888 was 142,037,735 short tons (increase over 1887, 18,022,480 tons), valued at the mines at $204,221,990 (increase, $30,625,994). This may be divided into Pennsylvania anthracite 43,922,897 short tons (increase, 4,416,642 short tons), or 39,216,872 long tons, including 38,145,718 long tons shipped by the railroads and canals and reported by their statistician, Mr. John H. Jones, and 1,071,154 long tons sold to the local trade at the mines (increase, 3,943,430 long tons), valued at $85,649,649 (increase, $6,284,405); all other coals, including bituminous, brown coal, lignite, small lots of anthracite produced in Colorado and Arkansas, and 4,000 tons of graphitic coal mined in Rhode Island, amounting in the aggregate to 98,114,838 short tons (increase, 13,605,838), valued at $118,572,341 (increase, $24,241,589).

The colliery consumption at the individual mines varies from nothing to eight per cent of the total output of the mines, being greatest at special Pennsylvania anthracite mines and lowest at those bituminous mines where the coal bed lies nearly horizontal, and where no steam-power or ventilating furnaces are used. The averages for the different States vary from 2 to 6.4 per cent, the minimum average being in the Pennsylvania bituminous and the maximum average being in the Pennsylvania anthracite region.

The total output of the mines, including colliery consumption, was: Pennsylvania anthracite 41,624,610 long tons (increase over 1887, 4,045,863 long tons), or 46,619,564 short tons (increase 4,531,367 shorts); all other coals, 102,039,838 short tons (increase 14,152,478 tons), making the total output of all coals from mines in the United States, exclusive of slack coal thrown on the dumps, 148,659,402 short tons (increase, 18,683,845 tons), valued as follows: Anthracite $89,020,483 (increase, $4,468,302); bituminous, $122,497,341 (increase, $24,492,685); total value $211,517,824 (increase, $28,960,987). The above figures show a notable increase in 1888 over 1887 in the aggregate output and value of both anthracite and bituminous coal, although not as great an increase as occurred in 1887 over 1886 in the value of the anthracite, or in the total tonnage of the bituminous coal.

Coke.—The production of coke in the United States in 1888 was 8,527,560 tons, valued at about $14,000,000. Pennsylvania produced by far the largest amount, the Connellsville region alone producing 4,955,553 tons; West Virginia, 528,533 tons; Alabama, 518,511 tons; Tennessee, 385,693 tons, and Virginia, 149,099 tons.

Petroleum.—The product of petroleum in the United States in 1888 was 27,346,018 barrels (of 42 gallons each), valued at about $24,598,559. Of this amount Pennsylvania produced 16,491,083 barrels; Ohio, 10,010,868 barrels; West Virginia, 119,448 barrels; California, 704,619 barrels; and other States 20,000 barrels.

Natural Gas.—The amount of natural gas consumed is given in coal displacement; that is, the amount of coal displaced by the use of natural gas. It is estimated that the amount of coal displaced by natural gas in the United States in 1888 was 14,163,830 tons, valued at $22,662,128. Of this amount 12,543,830 tons were displaced in Pennsylvania; 750,000 tons in Ohio; and 660,000 tons in Indiana.

Structural Materials.

Building Stone.—Direct returns from producers of the various kinds of building stone show that there was but a small gain in value over the figures of 1887. The value of the stone produced in 1888 is $25,500,000, or $500,000 more than in the preceding year.

Brick and Tile.—Value, $48,213,000. This figure represents only a small gain over 1887. This is due rather to increase in the number of manufacturing plants than to increased production at the older and more important sources of supply; in fact, many of the latter show a falling off in production. Prices also were generally somewhat lower than in 1887.

Lime.—The production is estimated at 49,087,000 barrels, with an average value of 50 cents per barrel, making a total of $24,543,500 as the value of the year's product. These figures are not largely in advance of those for 1887, and the gains are not so much the results of increased production in the leading lime regions as in localities of minor importance.

Cement.—The amount of cement produced in 1888 is less than for 1887, being 6,253,295 barrels for 1888, valued at 72½ cents per barrel, making $4,533,639 as the value of the year's product.

Abrasive Materials.

Buhrstones.—The product which is used for grinding cement, plaster, paints, feed, etc., comes from New York, Pennsylvania and North Carolina, and is valued at $150,000.

Grindstones. — Ohio and Michigan furnish practically all the sandstone from which grindstones are made. The product in 1888 increased slightly, 41,000 long tons, worth $281,800, being produced, against 37,400, worth $224,400 in 1887. The price varied from $6 50 to $10 per ton at the quarries before being finished into grindstones.

Corundum.—Production is limited to the old mines in North Carolina and Georgia; 589 short tons, valued at $91,620, were produced in 1888, against 600 tons in 1887.

Oilstones and Whetstones.—The production of novaculite from Arkansas increased slightly, making the total, including Labrador oilstone, etc., 1,500,000 pounds, valued at $18,000 in the rough state.

Miscellaneous.

Precious Stones.—No systematic mining was carried on in search of gems in 1888, but in mining for other substances and in chance discoveries, gems worth $64,850 in the rough state, and gold quartz worth $75,000, were found.

Phosphate Rock.—The production declined to 433,705 long tons, but the total value increased slightly to $1,951,673 on account of better prices. The trade in manufactured fertilizers was very prosperous.

Marls.—The production in the Southern States, particularly in Virginia, North Carolina, Alabama, Mississippi and Florida, is increasing, while the product of New Jersey did not vary from 1887. About 600,000 tons, valued at $300,000, were produced.

Salt. — The industry shows only slight changes. In 1888 the production was 8,055,881 barrels of 280 pounds, valued at $4,377,204. In 1887 the product was 8,003,962 barrels, worth $4,093,846. Kansas became a commercial source of salt in 1888, producing 155,000 barrels, with a prospect of still greater increase in 1889.

Bromine.—The product was 307,386 pounds, worth $95,290, an increase from 199,087 pounds in 1887, worth $61,717. The price remained at 31 cents per pound.

Borax.—The production was restricted to 7,589,000 pounds, worth $455,340, at six cents per pound for the average quality. In 1887 the product was 11,000,000 pounds, worth five cents per pound.

Sulphur.—The sulphur refinery in Utah was partially burned. This and litigation over the property prevented any production in 1888. The supply came principally from Sicily, with small importations from Japan. It was practically all made into sulphuric acid.

Pyrites.—Production 54,331 long tons, valued at the mines at $167,658—a slight increase in quantity over the previous year.

Barytes.—The production from Missouri, Virginia and New York increased to 20,000 long tons, worth at the mines $110,000; in 1887 the product was 15,000 long tons, worth $75,000.

Gypsum.—The domestic supply comes principally from Ohio and Michigan, with smaller amounts from New York, Virginia, Kansas, Colorado, California, Dakota and Utah. The product in 1888 was 96,000 short tons of crude gypsum, valued at $430,000. A large portion of the supply is imported from Nova Scotia, where 126,118 tons, worth $121,579, were produced in 1888.

Ozocerite.—From the region of Soldier's Summit, Utah, about 20,000 pounds of crude mineral wax were produced, worth $1000 in New York, where the material was sold. An increase is probable in 1889.

Soapstone. — Production about 15,000 tons, worth $50,000 before shipment.

Asphaltum.—The product of 1888 includes 700 tons of gilsonite mined in Utah; 3100 tons of ordinary asphaltum, principally from California, and 50,000 tons of bituminous rock quarried in California for pavements in competition with asphaltum; total value, $331,500.

Feldspar.—The consumption for potters' use declined to 8700 long tons, worth, in Trenton, New Jersey, $50,000. In 1887, 10,200 long tons were produced, worth $56,100.

Flint.—For potters' use the consumption was 16,250 long tons. Including that for sandpaper and for glass, the consumption was about 30,000 tons, worth, unground, $175,000.

Potters' Clay.—The consumption included 18,000 long tons of kaolin or china clay, 5250 tons of ball clay, and 13,500 tons of fireclay, worth altogether $300,000.

Mica. — Owing principally to the use of smaller sizes in stoves, the production of sheet mica decreased from 70,500 pounds in 1887 to 48,000 in 1888, valued at $70,000. There is increased demand for mica waste.

Mineral Paints.—The product, including ocher, metallic paints and small amounts of umber and sienna, increased to 24,000 long tons, valued at $380,000.

Graphite.—The production of pure graphite was limited to Ticonderoga, New York, and is reported as unchanged. The total production of pure material was 400,000 pounds, worth $33,000. Small amounts of less pure material for foundry facings, etc., were produced in North Carolina and at Cranston, Rhode Island.

Fluorspar.—The production, limited to the neighborhood of Rosedare, Illinois, and Evansville, Indiana, is reported at 6000 tons, worth $30,000, an increase of 1000 tons over 1887.

Infusorial Earth.—The product came principally from Maryland, and amounted to 2500 short tons, worth, before shipment, $12,500.

Zircon.—During 1887 and 1888, 25 tons of zircon were mined, principally in Henderson county, North Carolina, and sold for $10,000 for the manufacture of incandescent gas-burners. About four tons of monazite, one ton of allanite, 600 pounds of samarskite, and $500 worth of yttrium minerals were produced for the same use. About six tons of monazite and five tons of cerite were also imported.

Mineral Waters.—Amount sold in 1888, 9,628,568 gallons, valued at $1,709,302. In 1887 the product was 8,259,609 gallons, worth $1,261,473.

Totals.—The total value of the minerals produced in 1888 was $591,659,931. It is recognized that this is the sum of the values of substances taken in various stages of manufacture, and hence not strictly comparable with each other; still it is the most valuable means for comparing the total products of different years. The result is an increase of nearly $50,000,000 beyond the value of the product in 1887. In that year nearly every mineral industry showed an increase, and hence an increased total was evident. But the fact that the increase was so very large was due to rather exceptional conditions in a few important industries, and it could not reasonably be expected that a similar combination of circumstances would result in even a larger total value for 1888. Nevertheless the unprecedented stimulus given to the production of copper by an artificial price increased the total value of that product $13,000,000, or nearly enough to offset the decline in the total value of pig iron. The other important factors in the increase were coal and the other fuels which followed the increased quantity of metals. With the anticipated decline of copper to the normal demand, a decline in the total value of the product in 1889 will not be inconsistent with the natural development of our mineral resources.



THE GREAT EIFFEL TOWER AT THE PARIS EXPOSITION OF 1889.

The Eiffel Tower.

The most conspicuous object at the Paris World's Fair, which is now in progress, is the Eiffel tower, shown in the engraving on this page, for which we are indebted to the California *Architect.* The tower rises to a hight of 984 feet, and above that is the lightning conductor, so that the air is pierced by the structure to a hight of a round thousand feet. This is one of the most wonderful constructions the world has ever seen, and the altitude attained by such a network shows what great progress has been made in modern times concerning the strength of materials.

The tower rests on four independent foundations, each standing at one angle of a square about 330 feet on a side. The foundations reach to a depth of about 50 feet below the surface. As the engraving shows, the tower essentially consists of four great curved columns, independent of each other, and connected together only by belts of girders at the different stories, until the columns unite toward the top of the tower, where they are connected by ordinary bracing. Iron, and not steel, was used in the construction of the tower throughout. The total weight of the wrought and cast iron that has been used in this unique tower is 7300 tons, not including that used in foundations or machinery. The number of pieces of iron of different forms is 12,000. The tower is painted a rich chocolate color, the tone of which is lightened toward the summit.

The tower is a marvel to one who gazes from below at its sky-penetrating altitude, or views it from afar rising above the exposition buildings and adjacent structures, or catches by night the gleam of its electric lantern. Provision is made by which visitors are lifted to the top by elevators to view the vast landscape which is commanded from such a hight.

The tower is a credit to its designer and builder, M. Eiffel, and to the French people.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

PLYMOUTH CONSOLIDATED.—*Ledger*, July 13: Forty stamps only of the Pacific mill are kept running, and there do not appear any prospects of any more being started at present. There is something inexplicable about the working of this great mine since the fire, and numerous conjectures are indulged in to account for the methods adopted. At the time of the fire, or immediately thereafter, reports were afloat that the disaster was being used by insiders for stock-jobbing purposes to depreciate stock in the New York market. The stock fell from $20 to $8 and $9. When the property was reopened it was thought that the stock would soon mount to something like the old-time figures. With 40 stamps in operation the output for the three months ending May 1st, amounted to nearly $48,000, an average of $16,000 per month, which is at least $8000 per month over running expenses. This is certainly very satisfactory as far as it goes. Still the stock does not rally, as it ought to, if the outlook was favorable for the gold production to approach to ante-fire days. The impression is still strong with outside stockholders in New York that the stock manipulators are still at work for some object not well understood except by those who are in the scheme. That the ore is of good average grade is evident from the product of the 40 stamps. It is not so rich as in the best days of the property when $80,000 to $90,000 per month was the output of the 160 stamps. An agreement has been placed on record by which Eli Gardner and wife give immediate possession of the old Paugh mine to Robert Stevenson, for mining purposes, upon the deposit of $2000 with Wells, Fargo & Co. in San Francisco, for the practical working and development of said mine.

DRYTOWN CON.—*Dispatch*, July 12: The shaft on this property has been sunk 25 feet on the proposed 200 feet. They started sinking about three weeks ago, and have been doing good work for four men. Considering the time lost by breakages of water wheel, ditch and other delays, it is expected that they can sink 12½ feet per week in the future. The ore body is swelling into the shaft, has come in two feet in the 25 feet sunk. A piece of the ledge was broken off a few days ago that showed free gold. It is the intention to cut the ledge at the 400 and see what kind of ore they have and how large a body it is.

COSMOPOLITAN.—The shaft is down 600 feet and are still sinking; the raise from the 300-foot level was broken through to the 200 level last week; the tunnels north on the 300 and 400 are being pushed with all possible speed. The lumber for their mill will be delivered as fast as possible now, by Allen & Culbert; the first load was unloaded on Monday; it is all sawed and ready for hauling from the sawmill. In 90 days they expect to be crushing ore.

HENRY CLAY.—The Crocker tunnel is in 250 feet and is looking very well; they passed through some very good ore and a large body of ledge formation.

NORTH CALIFORNIA.—It is reported that a party of miners are about to lease this property for one year.

Calaveras.

CENTRAL HILL MINES.—Cor. Angels *Prospect*, July 13: A few days ago I visited Central hill, going first to the Benson claim. They have a good mine and do the work themselves. Five young men full of vim and push have driven a tunnel into a hill 700 feet where they have found a large body of pay dirt. The dirt is hard and they will soon erect a three-stamp mill to crush it. These parties are deserving of a good claim and they now have it. From the Benson's claim I went to that of J. Jackson & Co.'s. Here I found Mr. Hertzig erecting hoisting works. This claim has an engine of 30-horse power now in place, and a shaft 55 feet deep. These parties mean business and are prepared to thoroughly prospect their claim. I next visited Mullen's claim, which years ago was very rich and will be again under the careful management of T. Goodwin. I confidently expect to hear before long of good pay in these mines, as they are worked by miners of brains, experience and muscle, and are men, if successful, who can smile, and if unsuccessful, can meet defeat.

BENSON.—Amador *Dispatch*, July 12: This gravel mine, which is situated in Calaveras county, about seven miles below Mokelumne hill, is working steadily along. We made mention of this property a short time ago when they had just struck the pay dirt. Since then they have taken out about 500 tons, and have found the channel to be 60 feet wide; no timbering is required, as the dirt is hard enough to hold itself up the same as hard rock. A couple of pieces of the gravel were left at Kelly's last Tuesday, which show free gold in considerable quantities. D. Donnelly of Sutter creek will erect a ten-stamp mill on the property.

RICH QUARTZ.—Angels *Monitor*, July 13: Quite a rich deposit of ore has recently been unearthed in Peet or Whittle mine, near Albany Flat. The discovery was made at the 200-foot level. The quartz is of a cream color and contains little if any sulphurets. We were shown some specimens of the rock which, we feel confident, will yield at least $200 a ton, but simply that shown to us.

Del Norte.

QUARTZ DISCOVERY.—Del Norte *Record*, July 12: Judge Murphy on Wednesday showed us some very fine specimens of quartz from a newly discovered ledge on his property at the Bald hills, 11 miles east of this city. The rock is of a low-grade ore and easily milled, and if it will assay $6 per ton it will pay to work it, as there is an abundance of ore in sight to justify putting up a small mill. Mr. Murphy sent below, on the steamer Crescent City yesterday, several hundred pounds of ore which he will have assayed, and it is his intention on the returns to put a crew of men to work the ledge.

Los Angeles.

THE PUENTE OIL WELLS.—Los Angeles *Herald*, July 13: Great developments are being made at the Puente oil wells. Number 12 promises to run from 45 to 50 barrels a day after the "head" is worked off and it settles down to a steady business. Number 14, the last well on the list, is now down 190 feet. It will have to be bored to between 800 and 1000 feet to find oil, if the stratum dips as it is supposed to at the point where the hole is being made. Number 9 has been an excellent well, giving up a good quantity of oil each day since the pumps were set at work in it many months ago. It is down to a depth of 930 feet, and, from its situation in the canyon, it looks as if a better flow might be had at 1100 or 1200 feet. The drills are now at work, sinking the hole to a lower level.

Mono.

BODIE CONS.—*Miner*, July 15: During the past week west crosscut No. 2 from north drift, 1200 level, was advanced 12 feet. East crosscut from north drift, same level, was driven 10 feet. There were employed nine miners, one foreman. Jointly with Mono winze from south drift, 1000 level, was extended nine feet.

MONO.—During the past week west crosscut from south drift, 1200 level, was advanced 19 feet. There were employed six miners, one foreman. Upraise from south drift 1200 level was driven 35 feet.

Nevada.

GOLD POINT MINE.—Grass Valley *Union*, July 11: A shaft is being raised in the Gold Point mine from the level of the tunnel 1500 feet from its mouth. The raise to surface will be 136 feet, and the shaft in two compartments for ladder-way and for hoisting by whim. After this is completed, the shaft will be sunk below the level of the tunnel, and for the present the ore will be raised by whim, the company using one of the steel whims made at the Risdon Iron Works, S. F., which is the best whim in use, light and durable, and capable of working a mine to the depth of 300 feet. The shaft in the Gold Point will be raised through in about ten days. The ledge in the tunnel is now seven feet in thickness, and of good appearance as to quality, and the outlook is favorable for the development of a valuable mine, as with a ledge of this size low-grade ore will yield a handsome profit. The Gold Point location is to the southeast of the Idaho near the south branch of Wolf creek. The work of driving for the ledge was commenced several years ago, but work was suspended for some time until recently, when operations were resumed. The work of development will now be prosecuted diligently, as there is every encouragement to do so. Jas. Bennallack, one of the principal owners, is superintending the work.

UP-COUNTRY MINES.—*Tidings*, July 16: The permanency of the quartz industry in Washington district is established beyond all cavil. The Yuba mine is yielding from $7000 to $10,000 a month over expenses, which aggregate only $3500 per month. Ledge improving in size and quality with depth. The Eagle Bird is looking better than ever before; the Washington mine is paying, and a dozen promising prospects are being put in shape for systematic working.

DELHI QUARTZ MINE.—Grass Valley *Union*, July 16: The Delhi quartz mine, in which Robert McMurray is the principal owner, continues to yield with its customary profitable results. The ledge is very strong, in places 14 feet in thickness. The mine is worked by tunnels, no pumping or hoisting to be done, and the quartz can be milled and mined at $3 per ton.

NORTH BANNER.—Grass Valley *Union*, July 14: Gordon Morgan is down from the North Banner mine and he reports that all the miners of that mine have been laid off except some contractors who are sinking the shaft.

Placer.

DAMASCUS.—Placer *Argus*, July 13: At Damascus they have made an upraise from an east branch of the main channel of Mountain Gate, and are working on the Damascus side with good results. A tunnel has been started at the Gray Eagle. The tunnel will be run from Owl creek to the present shaft, a distance of about 2600 feet. The tunnel is to be 7x7 feet, and run on a grade of one inch to the hundred feet.

RED POINT.—At Red Point the main tunnel is 2100 feet to where they made their upraise and struck the channel. They have suspended present work in the gravel, and are putting in an east branch to the main tunnel, starting from the 1800-foot point, which will extend 800 feet. They are using Burleighs, and are in extremely hard rock at present. They stopped working the gravel June 14th, and cleaned up for the 14 days' run in June about 600 ounces, the gold being worth $18.90 per ounce. From one-half the floor of its dump, taken up last week, over 20 ounces were washed. They get their water supply through a seven-inch pipe-line, 6400 feet in length, from Humbug canyon. During Mr. Hoffman's visit to Paris the mine was paying finely, and Mr. Snyder, the foreman, sent daily cable dispatches reporting the yield, which was something over 50 ounces per day. J. B. Hobson showed us some rich specimens of cement from the Morning Star mine. He says that in two years' time four dividends of 50 cents per share have been paid, and an indebtedness of $10,000 has been canceled; 2000 feet of bedrock tunnels and gangways have been opened; $55,000 cleaned up, and their present tunnel, when completed, will place the mine in a first-class condition for advantageous work. Hon. C. F. Reed has purchased the Drummond mine at Cottage Home, and intends putting up a mill directly. This promises to be one of the richest quartz mines in the State, as specimens Mr. Hobson showed us indicate. The old Linn mine, now the Pioneer, under the control of Fair & Davis, is being well worked and is paying well. The Horman mine near Wisconsin Hill, under the new management, with new mill and appliances, may be expected to be in first-class condition shortly. The Washington mine has been paying at the rate of about $2000 per month for some time.

Plumas.

GOLD QUARTZ.—Plumas *National*, July 13: We were shown some beautiful gold quartz last week from the Moore & Owens mine at Rush creek, near Greenville. Mr. Owens tells us that he has a fine ledge six or seven feet wide, and it will pay $20 to $30 per ton. The ledge is admirably situated for working, as a tunnel can be put in so as to tap it 700 feet below the surface. Greenville district offers a splendid opportunity for capitalists. There are good mines in that great ridge, but it will take capital to develop them. The Megoyn quartz ledge is looking more and more promising. Will Richard tells us that the indications are that it is one of the richest and most extensive mines in the county.

Sierra.

FREE GOLD.—*Mountain Messenger*, July 14: C. C. Smith, J. L. Jones and others, who relocated the Mexican ledge above Downieville about one year ago, have struck a four-foot ledge that prospects plenty of free gold. Goodell has found good paying drift diggings about 1½ miles above Poker Flat, on Cold canyon. After settling with his men, he pockets a weekly dividend of $100.

Siskiyou.

GREENHORN CREEK.—Yreka *Journal*, July 10: We were shown on the 4th of July a number of exceedingly rich specimens of gold quartz from the ledge of the Heckathorn & Wademan, at Greenhorn creek, a couple of miles south of Yreka. The specimens contained more gold than quartz, taken from a rich pocket in the center of the two-foot ledge. This quartz ledge has been paying handsomely by pounding the rock out in a mortar all winter, but the owners soon intend hauling some quartz to the mill on Yreka Flats for crushing. John F. Boyle & Co. of the North Star ledge at the head of Humbug creek, realized $120 a ton from ten tons of quartz crushed just before the 4th of July, and have 50 tons more in the mill to be crushed as soon as the steam engine from below is received to run the mill, the water in Humbug creek being too small a body to run the mill at present. Messrs. O'Dea & Maurer, two enterprising miners from the Calico district of Southern California, have located the old Knapp ledge on the head of Humbug, from which a big haul was made many years ago, and work suspended on account of ledge pinching out. The hands at work in sinking a well for Vance, Churchill & Autenreith, at Yreka creek, to supply water for their places in town, are anxiously watching for prospects in reaching the bedrock, as many sections of Yreka town site have paid as high as a dollar to the pan, if not more.

San Bernardino.

VICTOR.—*Press and Horticulturist*, July 13: S. S. Nowlin, who has been for several weeks inspecting the new mines in which he is interested near Victor in this county, returned Tuesday. He is very enthusiastic over the prospects. Mr. Nowlin says that at the Victor placers they have five men at work, and they have dug to a depth of 50 feet. The first 26 feet down they found gold in every foot of dirt; and a stratum of volcanic ashes was found for the next 14 feet bearing more or less of wire silver. At the depth of 40 feet bones were found in quantities, which Mr. Nowlin says are unlike any bones that he has ever before seen. They are larger than the bones of an ox, and about half an inch thick from the outside to the marrow. The marrow is petrified. Below this they again found a stratum bearing gold, which still continues. He states that they have their sluice-boxes all completed and have begun to work them. There is plenty of pine growing in that section, some of the trees being very large. Mr. Nowlin thinks that the prospects at the Victor mine are that the company has something valuable.

San Diego.

THE STONEWALL MINE.—Cor. *Times*, July 12: The Stonewall is a mining camp only. It has an elevation of 4700 feet, being 200 feet higher than Julian. At present it has a greater appearance of business and activity than any point I have visited, there being about 70 men employed. The nearest to a reliable estimate of the grade of the ore obtainable would put it at about $20 per ton, with an average crushing of about 25 tons per day, or a return of $500 per day. The expenses of the institution are near that amount, and it is safe to say that the net returns just at present are small. There seems to be a feeling of uneasiness on the part of the management from unseen causes, but probably attributable to the uncertainty about the result of the late reported sale of the property. Excavations for the new 20-stamp mill which was to have been put in have ceased and it is uncertain when work will be renewed. Visitors are refused entrance to the mine. The road from Julian to Stonewall is quite rough, but there is some fine scenery among the Cuyamacas and on the desert in the distance, making the trip well worth taking.

PINACATE.—Riverside *Press and Horticulturist*, July 12: D. A. Wheeler returned last Monday from Pinacate, where with several others he has engaged in mining operations. The following persons have formed a company for the purpose of mining in that section: W. S. Sweatt and D. A. Wheeler of Riverside, Dan Johnson, Geo. Hubbard and Jerry Shay of Colton. They have had dug into the mountain a tunnel 125 feet long in order to get rid of the surplus water that they may prospect to better advantage. A very good ledge 2½ feet wide has already developed, and they are of the opinion that the prospects for a rich mine are very flattering. They have bonded the Virginia and three other mines at that point until December 25th, and will work them steadily until then, unless discouraging features previously arise; but if the mines prove to be valuable, the purchase price has been agreed upon and the company will complete the purchase. Mr. Wheeler will go East this week and investigate the different kinds of mining machinery. When he returns it will be decided just what will be used for reducing quartz.

WASHINGTON.—Julian *Sentinel*, July 13: Work on the Washington mine was commenced in earnest Monday morning. The old shaft is to be cleaned out and retimbered, and the work pushed as rapidly as possible to the depth of 150 feet, when crosscutting will commence. Messers. Keener and Dilks have the contract.

THE Helvetia mine is running night and day. The owners are pushing things for all there is in it.

JUST as we go to press we hear that a very rich strike has been made in the Owens mine.

GOLD KING.—We visited the Gold King mine this week and found the boys hard at work developing their fine property. We were shown some very fine ore, which will have to be hauled some eight miles to be milled. They have a group of six mines, which promise to be very rich.

Tuolumne.

MOFFIT'S MINE.—Tuolumne *Independent*, July 13: Work is being pushed on Mr. Moffit's mine in the Tuolumne river, below the bridge. He expects to be able to get to mining about the 1st of Augus., or 15 days earlier than last year. A force of 22 men is now engaged, working on the dam, putting in machinery and pumps. The flume will be ready as soon as the dam is finished, and by that time will carry all the water, as the river is falling fast. Partly new ground will be operated on. The prospects are very favorable for a good season.

NEVADA.

Washoe District.

YELLOW JACKET.—Virginia *Enterprise*, July 13: Shipping to Brunswick mill 100 tons of ore from the levels above the 1200. Everything about the mine is in tip top shape and there is a great deal of prospecting going on all through the mine.

SAVAGE.—On the 400 level the joint west crosscut has revealed the west clay wall of the vein and has been discontinued. Have resumed work in the face of the main west drift from the station, and advanced the same 26 feet. On the 500 level the prospecting drift north from the upraise is advanced 57 feet; the face continues in quartz carrying some good ore. The joint west crosscut on the south boundary has been advanced 20 feet. There is no change to report in the character of the ground. Have discontinued the shipment of ore on account of the stoppage of the mill. Have shipped in bullion on June account $21,855.

BELCHER.—Have stopped the 1100 raise as it arrived at the 1100 level. The 1100 winze is down 36 feet, the bottom showing quartz assaying from $5 to $18 per ton. The 1100 south drift is out 188 feet. Can hear soundings plainly from the 1100 raise in it. The 1200 south drift is out 164 feet. The face is all in quartz, showing spots of ore, but low grade on an average. The 200 west crosscut is out 83 feet in hard rock.

JUSTICE.—The 490 winze is down 67 feet; the bottom shows four feet in width of good ore. The shaft is down 95 feet below the 490 station and is still in very hard rock. No change to note in the stope. Have shipped to the mill during the week 189 tons of ore, average battery assay of which was $23 65.

HALE & NORCROSS.—On account of the stoppage of the mill have had to discontinue taking out ore. Have men on repairs in all parts of the mine where needed; also in retimbering the main working shaft and running prospecting drifts. Have shipped $73,881 in bullion on June account.

OVERMAN.—Have run the mine five days during the week, and extracted 75 tons of ore. Shipped to the Vivian mill 72 tons. At south end of No. 3 stope, at a point 50 feet above the track floor, have extended an incline upraise to the west 20 feet. Material, porphyry and quartz.

CON. IMPERIAL.—The joint Confidence-Challenge-Imperial north drift on the 500 level, corresponding with the 700 level of Imperial, is now in 749 feet from the Yellow Jacket shaft, 21 feet having been added during the same time. The face is in quartz giving low assays.

CHALLENGE CON.—The joint Challenge-Confidence and Imperial north drift on the 500 level is now in a distance of 749 feet from the Yellow Jacket shaft, 21 feet having been added since last report. The face shows quartz giving low assays.

POTOSI.—South lateral drift, 750 level, is out 532 feet; face in porphyry. South lateral drift, 850 level, is out 510 feet; face in quartz and porphyry. West crosscut, 480 feet south of Chollar shaft, 930 level, is out 50 feet; face in porphyry.

CONFIDENCE.—The letter from this mine is the same as that from the Challenge, which is doing work jointly with the Confidence. There is considerable prospecting work going on in both the Challenge and Confidence.

CROWN POINT.—The northwest drift on the 350 level is out 38 feet in soft porphyry, showing stringers of quartz. Have started up the main south drift on the 700 level, which is now out 198 feet from the shaft.

ALPHA.—On the 500 level the west crosscut, 60 feet south of the shaft, is out 50 feet; face in low-grade quartz. The east crosscut south of the line on the 500 level is out 530 feet; face in quartz and porphyry.

NEW YORK.—North lateral drift from the northeast crosscut, 800 level, is out 250 feet. The drift is following the east side of the ledge, where there is a reported improvement in the material encountered.

SEG. BELCHER.—The 1100 raise is now up 170 feet, having advanced 15 feet since last report. Have started an east drift from it on the seventh floor, which is out 18 feet in soft porphyry.

EXCHEQUER.—On the 382 level the west crosscut, 150 feet south of the north line, is out 70 feet; face in quartz of no value. East crosscut, 150 feet south of north line, is out 50 feet; face in porphyry.

CHOLLAR.—The north lateral drift on the 750 level is out 325 feet; face in porphyry with streaks of quartz. North lateral drift 850 level is out 510 feet; face in porphyry.

EAST SIERRA NEVADA.—On the 520 level the east drift from the Sierra Nevada shaft is advanced 734 feet; face in porphyry, with some water coming in.

SCORPION.—On the 520 level the new east drift from the Sierra Nevada shaft is out 734 feet; face in porphyry, with some water.

ANDES.—Sinking winze in quartz of no particular value below the 350 level. Repairing the north lateral drift on the 350 level.

SILVER HILL.—The raise in the southeast drift, 670 feet from the shaft, is up 90 feet; formation porphyry.

BALTIMORE.—Continue to extract ore of good grade from the crosscuts on the 225 and 338 levels.

BULLION.—Running north on the ledge on the 760 level. Now distant from the shaft 175 feet.

ALTA.—Are running the mill steadily, and the mine is yielding the usual quantity of ore.

Ely District.

PURCHASE.—Pioche *Record*, July 12: W. S. Godbe and John Claflin of New York City have concluded the purchase from C. H. Patchen of the Gold, Silver, Currency and Greenback mining claims, paying $8000 therefor. The four claims are situated on Spring mountain, in town here, and include the mines formerly known as the Washington and Creole, the Mazeppa and the Unknown. There is no pay ore in sight in the claims now, but the bodies of ore re-

cently struck on the 1200-foot level of the Yuba lead to the westward and it is thought they will continue through the claims purchased to the Raymond & Ely ground, the black ledge there being of similar quality.

THE YUBA.—The Yuba Mining and Reduction Co. last Wednesday purchased from W. J. Shivers his mining interests on Spring mountain here. The claims are the Deerfoot, Alpha, Idria and Columbia, and join the Yuba mine on the west. They are regarded as good prospects. The amount paid was $2500.

Eureka District.

NEW RATE FOR ORES.—*Sentinel*, July 13: Supt. Gilman informs us that a new rate for the transportation of ores over the E. & P. railroad is in contemplation, and will most probably be adopted at an early day. It is to be based on the grade of the ores shipped. The exact figures have not been determined upon, but the new schedule is likely to run something like this: On exceedingly high-grade ores the present price of $5 per ton; on ores running in the neighborhood of $100 per ton, $4 per ton; on ores of the value of $50 per ton, $3 per ton, and on ores working say $30 per ton, $1 per ton—or the absolute cost of handling them. Of course these figures may be varied a little, but the above illustrates the idea fairly well. The concession is an important one, and is about the best move that has been inaugurated for this camp in its history. We are assured of corresponding reductions by the big roads on ores to Salt Lake. The smelting trust here has ruined all business. It has starved the miners out and the little railroad as well. The community is to be congratulated on the fact that our railroad has determined to make this new departure. It is going to make a strong effort to build up a business in spite of the trust. That it will succeed we have not the slightest doubt. There are millions of tons of ore in this district that will be mined and shipped under the new order of things. It is a pity that this liberal policy had not been inaugurated two years ago before so many good miners were driven out of the camp by the outrageous combination of our local smelters. But the change is better now than never.

THE EUREKA CON.—*Sentinel*, July 13: Pres. Fries of the Eureka Con., accompanied by an insurance adjuster, came up on Thursday's train. Mr. Fries is not certain what will be done until he looks over the ground. The best opinion is that the company must rebuild. There is no other way out of the present difficulties. The company is behind, and there is no way for the shareholders to get out with a dollar except to keep things moving. It is generally believed here that the insurance money will not be pocketed. In self-defense the company must rebuild.

Campbell District.

ORE. — Reese River *Reveille*, July 10: James Campbell returned to Lee Vaughan's ranch to-day and will by horseback return to his mine to-morrow. Bob Crawford hauled the ore from the mine to the Sampling Works for $11 per ton, and though it was low-grade, yet it worked up to the expectations of Mr. Campbell. In a few weeks he will send in another load by Crawford's wagon.

Golconda District.

ADELAIDE COPPER MINE.—*Silver State*, July 13: Three shifts of men are now at work sinking the shaft on the Adelaide copper mine near Golconda. There are steam hoisting works at the shaft, which is now down about 100 feet. When a depth of 30 feet more is attained levels will be opened. The shaft is six feet wide and is all in ore, which assays well in silver as well as copper, and also carries gold.

Tuscarora District.

NORTH COMMONWEALTH.—*Times-Review*, July 12: East crosscut on the 100-foot level extended 18 feet; total length 130 feet; the face shows seams of spar carrying high-grade ore.

NORTH BELLE ISLE.—From the north drift from the bottom of the winze below the 400-foot level, a crosscut has been run to the vein cutting into it four feet, two feet of which is high-grade ore; work has been temporarily suspended at this point to enable the Queen to drive a crosscut, the windlass being unable to handle the dirt from both places at the same time with the water.

GRAND PRIZE.—The stopes show an improvement in both quantity and quality of ore produced during the past week. The concentrator was started up yesterday, is running smoothly and doing good work. Pump for the mine is now in Elko, will arrive here this week and be set up and put in operation as soon as possible.

NEVADA QUEEN.—No. 1 crosscut, 550-foot level, has been advanced 17 feet, cutting into two feet of good ore, assaying from $46 to $360 per ton; have not reached any hanging-wall. Winze from 450-foot level has been sunk eight feet; total 62 feet. The ore has been continuous; assay from the bottom $309 per ton.

BELLE ISLE.—West crosscut from the end of the north drift, 250-foot level, extended 15 feet, passing through a vein nine feet wide giving low assays. North drift, 150-foot level, extended nine feet, showing some vein matter with a little water.

COMMONWEALTH.—The stopes continue to look well; 219 tons of ore have been sent to the mill, average battery assay $119.34 per ton. Bullion shipped on the 8th $12,822 and about $12,500 to ship to-day.

DEL MONTE.—North drift, 100-foot level, extended 10 feet, showing seams of spar carrying iron. East crosscut, No. 1, same level, extended 18 feet; face still in vein.

NAVAJO.—Upraise on the east vein at the south end, 350-foot level, extended eight feet, continuing to show high-grade ore.

Tybo District.

FINE GRADE ORE.—Belmont *Courier*, July 13: There are large quantities of ore in sight in the Dimick mine and the output is of the usual fine grade. Things are looking favorable in this mine for a good summer's work.

ARIZONA.

NOTES. — Mohave *Miner*, July 13: The Flores Consolidated Mining Company have a carload of concentrates at the depot awaiting shipment. Frank L. Smith shipped two carloads of ore to the Rio Grande Smelter at Socorro this week; one car for M. P. Delhanty and the other of small lots from various miners. John Jamison, who is now working the Jamison mine at Layne Springs, says that the chloriders in that district are doing well, and that the Nighthawk is still taking out high-grade ore in quantities. The Moss mine is being worked with a small force of men. About 100 tons of ore has been hauled to the mill at Hardyville and run through the mill. The result is reported as being satisfactory to the manager, Captain C. B. Dahlgren. F. H. Taylor, a Yavapai county miner, who has been here about three months prospecting, has made a rich strike near Wallapai Springs, in the same neighborhood as the Cummings mine, and the Fyntelle is said to be as promising as the Cummings mine. John Hughes and J. Mitchell have made a strike in the Dolphin, located about three miles south of Stockton Hill, which is said to be the richest strike yet made in that district. The ore is black sulphurets, and the pay streak is from two to four inches wide and assays 2600 ounces per ton. M. D. Howell, the manager of the C. O. D. mine, is well pleased with the new bodies of ore recently uncovered in that mine, and believes that they will prove even richer than any former discoveries. A number of additional miners have been added to the force and others will be put at work as soon as the ground is opened and room is made for them. The Sampling Works have been running but two days during the week, and the following lots were run through: C. O. D. mine, 32 tons of higher grade than has been lately shipped. Harvey & Co., lessees on portion of C. O. D., three tons of high-grade ore. Wm. Grant, one and a half tons from vicinity of Hackburry, and several small lots. The assay office is kept busy, and several carloads of ore are on the way to the works from the mines.

DIFFERENT CAMPS.—Prescott *Journal-Miner*, July 3: Work on the Harqua Hala mines has been suspended pending a sale to San Francisco parties. Two of Culver's big teams arrived last night bringing in a little over 40,000 pounds of ore from the Congress mine. Robeson & Foster of Big Bug had worked a 20-ton lot of ore at the sampling works to-day. F. E. Murray, in connection with J. J. Williams of Copper basin, are engaged in developing the Boggs and Hackberry mine on Big Bug, and have 40 men engaged in developing those properties. Work is being pushed day and night. They are at work on three shafts, one of which is 110 feet deep, another 50 feet and the third 25 feet, all of them being in good ore. The Dixie mill on Lynx creek was started up on Saturday, and worked to the satisfaction of its owners. Well-informed mining men are all of the opinion that the outlook is good for increased activity in the mining industry of this county this fall. Much capital is now looking in this direction for investment. The Congress mine will shortly add an electric light to its many other conveniences for mining.

VEKOL.—Florence *Enterprise*, July 13: Mr. Robert Bowen, who was foreman of the Silver King mine continuously from its first workings up to the time the Bonanza Company obtained control of it, several months ago, is one of the most competent and conservative mining men in Arizona. Mr. Bowen recently visited the Vekol camp and inspected the ore bodies of the Vekol and other mines in that vicinity. He says the Vekol is the finest property he has yet seen for poor men to start with upon a sure road to fortune. The irregular ore shoots are in lime, in bunches or chambers more or less connected with small stringers that guide the prospecting unerringly from one body to another. The dip is very irregular, sometimes almost horizontal and sometimes pitching down at a considerable angle. It presents many new features in ore bodies, and the ore heretofore extracted has been taken out cheaply and without the necessity of timbering. The belt in which the ore is found has been opened 300 feet in width and its extreme width has not yet been determined. The Argosy, an adjoining claim, shows the same character of ore and formation, but carries a larger percentage of lead and is therefore not free milling in character. It is one of the most promising properties in that camp.

THE SILVER KING.—When questioned about the present condition of the Silver King mine, Mr. Bowen unhesitatingly expressed his full faith in the ultimate outcome of that favorite property, and thinks that good ore bodies will be developed below the present workings. For the first 250 feet from the surface the ore was badly broken up and was almost worthless; the quartz, spar and porphyry were all mixed up and of little value. Then the ore chambers were encountered and continued down below the 800 level, the huge masses of ore being very wide at the bottom and narrow at the top; in fact, pear-shaped. The deepest winze was in the same broken formation as that found near the surface, and he believes it will again open out fully as rich as above. The valuable ore so far found has been confined to an area of about 125 by 300 feet.

A BIG MINING SECTION.—Mr. Bowen regards the mineral belt that embraces the Mineral Hill and Mineral Creek sections as the greatest and most extensive of any in the Territory. A great deal of the ore is low-grade and its character so varied that large works capable of treating in quantity every class of ore will be required. Rail transportation will be indispensable, and a north and south railroad that will skirt the foothills along Mineral Hill and the river by way of Riverside will speedily develop several great mining camps.

THE GREAT EASTERN is another fine mine, with very good appearing ore. Considerable work has been done upon this property. The ore is of a character similar to that in the Argosy and Vekol.

BRITISH COLUMBIA.

OKANAGAN CAMP.—Kamloops *Sentinel*, July 9: This camp is situated about 16 miles from Osoyoos lake and about 18 miles north of the boundary line. From Mr. M. McMillan, who has just returned from the camp, we learn there are about 30 men at work, but matters are rather slow at present. There are 13 claims in the camp on which development work is being done, and all show well and promise good returns when the veins are properly opened. The owners of the Wide West claim recently refused $75,000 for the property. The latest and best strike in the camp is on the Brown Bear claim, owned by Geo. Wilkinson and others. It shows more free gold than any other claim in the camp, and will doubtless be the means of drawing the attention of capitalists to these claims. The camp is easy of access, a good pack trail now being open to it, and an excellent wagon-road can be opened up with little expense, it being necessary to build only about 1½ miles of road, with very few obstacles to overcome. The camp is distant from Pendicton, at the foot of Okanagan lake, about 20 miles. Mr. McMillan also visited the new diggings on Siwash creek near Vernon. He reports about 70 men on the creek, and great excitement. The gold taken out is coarse, and all the miners report good pay. There is considerable excitement owing to the action of the Indians, who have pulled up the claim stakes and destroyed the notices posted on the reservation by the whites, and have driven the whites off altogether. The Indians are working the creek themselves, where it runs through the reserve, and are taking out good pay, according to the report of Mr. McMillan, who was standing by while a clean-up was made. He gives it as his opinion that the creek is rich, and as it is easy to work, a large amount of pay will be taken out. It is reported that John Merritt has struck it rich on Cherry creek. No definite information is to hand, however.

COLORADO.

STOPING.—Georgetown *Courier*, July 11: Stoping is going on in the Atlantis, an extension of the Johnson, and good ore is coming out. The Mohawk Tunnel and Mining Co. of Clear creek county is the name of a recent incorporation. Mr. J. B. Johnson has leased the entire available ground in the Paymaster for a year. About 22 men are employed. Another adit has been started on the Independence farther up the mountain. Adits 1 and 2 are also being extended. O. E. Clark has started up work on the Peruvian. As soon as work is fairly under way the output will probably average ten tons a day. The work of putting in large pipes and an exhaust to more readily clear the Hall tunnel of smoke and gas was completed last week, and work at driving the tunnel resumed on Monday. It is now in nearly 1400 feet. Adits 3 and 5 on the Johnson are being cleaned out preparatory for work. A crosscut is to be driven on No. 5, as it is believed the adit is off the pay vein. Other portions of the mine are turning out an excellent grade of ore. George Mills has found that the material he is pitching over the dump in his Banner district mining, contains numerous particles of free gold. A larger engine is to be placed in the Colorado Central mine, and the shaft sunk another hundred feet this summer, which will make its depth 850 feet. The 750-foot level has been driven through nearly 800 feet of mineral, and the stopes run from 10 to 25 feet in width. It is reported that the purchasers of the Pelican Dives will put up a working capital as soon as they get the final deed to the property, which will be the latter part of this month. At the present nine men are employed, nearly all of whom have been in the mine for the past 12 years, and couldn't be driven out.

DAKOTA.

DIVIDENDS.—Deadwood *Pioneer*, July 12: For the six months ending June 30th the Homestake paid in dividends $112,500, or 90 cents per share. During the same period the Caledonia paid $48,000, or 48 cents per share. Total paid by both companies, $160,500, or $16,050 per month.

CLARK'S PROCESS.—The perfected roasters, to superintend building which R. D. Clark went to New York last March, arrived at Whitewood a day or two ago. Harry Clark, who came in yesterday, will supervise their erection, probably at the Buxton, where they are to be thoroughly and it is hoped successfully tested. Mr. Clark's confidence in applicability of his process to treatment of Black Hills refractory ores is not shaken one jot. He claims that the catastrophe of March 1st by which reduction works were destroyed alone prevented his demonstrating it a brilliant success. This confidence is shared by a large number in the community. Mr. Clark, so it is stated, proposes to carry out and prove the process if to that end he is compelled to put up a plant here at his own expense.

IDAHO.

FAY TEMPLETON.—Wardner *News*, July 14: About a month ago the Fay Templeton mill and mine were leased to the employes to whom the company was indebted about $1900 when work was stopped in May. They placed one of their own number, Alfred Lamson, in charge of the mill, and began running it on 12-hour shifts. Mr. Lamson is a practical miner, but has had very little experience in milling and knew nothing about a Huntington plant until he took charge of the Fay Templeton. Up to June 27th, the mill was run 264 hours, crushing one ton per hour. Four cleanups were made, the total yield of which was in round numbers $2400. The first cleanup after a run of 60 hours, yielded $713; the second, 84 hours, brought $800; the third, $515; and the fourth, the remainder. There were 14 men on the pay-roll until the last run, when the number was reduced to ten. All were paid regular wages, and $600 were applied on back pay; this, too, in spite of many disadvantages under the circumstances. It would certainly seem that under the management of practical and economical men, the Fay Templeton property should pay a good margin of profit.

BONDED.—Dan O'Brien, the old-timer of the north side, who has been in Wardner during the week, has bonded the Bismarck group of mines near Murray for an Eastern syndicate through the interest of Major Hopkins. The Bismarck is considered a valuable property, and much development work has been done upon it during the last three years. It is said that the consideration of the bond is $100,000. It is hoped the sale will be consummated, as we know of no men who could bear good fortune better than Messrs. Horn, Meyerenthol & O'Brien.

NEW MEXICO.

PINOS ALTOS.—Silver City *Enterprise*, July 13: The First Luck, belonging to Peter Kness, is showing up well. The new find on the El Dorado, No. 2, is developing handsomely. The pay streak is 15 inches in width, and is improving in depth. The arastras just completed will soon be set in motion and the ore thoroughly tested on the ground. Recently seven pounds of ore from the Mountain View mine, on being reduced, gave a return of $28. At this writing the vein carrying the rich tellurides shows no signs of diminution, and it is now a demonstrable proposition that the mine in question has more than enough in sight to pay for the mine twice over. The Casson bids fair to become one of the prominent mines of the district. The shaft is 75 feet in depth and furnishes a model which others would do well to follow. The timbers are mathematically correct in their alignment, and the work from the surface to the bottom is indicative that a master hand is in charge. The ores at the bottom of the shaft are improving with depth, and the manager, Mr. Morehead, confidently believes that the next 20 feet will develop into a fine vein of paying ore. There are several sales on the tapis, which in their order will be consummated within the next 20 days. The continuation of the Pacific crosscut tunnel has been let on contract. Billy Davis and Geo. Husband, two well-known and popular miners, were the lucky bidders. Editor Christman of the *Miner* has leased the old Ohio lode and is in a fair way of making some money.

MONTANA.

THE MOUNTAIN LION.—*New North West*, July 12: The strike on the Mountain Lion, in the Oro Fino district, is significant in the fact that the ore is very rich in ruby silver, even impregnating the porphyry seams with which it is stratified. The strike of high-grade ore at 200 feet depth shows that in the Lion, as in the Champion, and presumably in all true fissure veins of the camp, the rich ores are deep. This is what makes a good camp.

THE MINNIE PALMER.—Sam Ritchey, General Manager, came up Monday, bringing some good ore that is now being taken from an upraise on the mine. After sinking the shaft to a depth of 165 feet the water came in faster than it could be handled with the present facilities, and further sinking had to be abandoned for the present, although the vein was widening. The three shifts that were working on the shaft were, therefore, knocked off, and the water raised 35 feet in 24 hours.

THE CHAMPION.—The stopes at the 250 level are rich and productive as ever, but the output is being cut down to about six carloads per month. Last month's output left $11,000 net in the company treasury, and as it is not designed to stope out ore to haul by wagon to pay dividends, the output has been checked and work pushed westwardly on the 350 foot level. At last accounts this was getting better.

THE FRANKLIN.—Owing to the bad air, work was suspended on the Jumbo tunnel of the Franklin Co. four or five weeks ago, and an engine and blower ordered from Chicago. There has been a tedious delay in getting this machinery started.

GOSPEL MOUNTAIN CO.—The Gospel Mountain Co. is making good progress on its shaft, which was down 110 feet on Sunday.

OREGON.

WALLOWA COUNTY GOLD QUARTZ.—*Oregonian*, July 12: The Wallowa *Chieftain* says: Last week the Legore boys brought a very fine piece of gold-bearing rock down from their Pine Leaf ledge. Dr. Dean took the ore, crushed it, and with a common miner's pan got about $1 worth of gold from the specimen. It is estimated that rock equally as rich would be worth about $2000 per ton. We are told that the boys have been throwing similar ore over the dump because it appeared worthless. If one-half the noise were made about our mines that there is elsewhere on less reason, Joseph would be a pretty lively camp this summer. Plenty of work and a little time will bring the Wallowa mines out all right, and you want to remember it. The property spoken of at Joseph, Wallowa county, is considered by many experts, as far as developed, one of the best purchasable properties in the State. It is essentially a silver formation, but this gold rock discovery is nothing new. About a mile south of the Legore claims, the same vein, at 150 feet deep, in another claim, assays $170 in gold, besides silver and lead in paying quantities.

UTAH.

MAYFLOWER BONANZA.—*Record*, July 13: The leasers of the Mayflower No. 7 mine have developed their property into a veritable bonanza. Operations are being pushed with a vim, and since air connections were made with the Woodside, developments are made with greater facility. A large ore chute and ore bin have been built, and from now on the Mayflower will be one of the heavy producers of the district. Peter Boyce sold his one-fifth interest in the lease the other day for $6500 to John Judge.

CAMP CROSSCUTS.—The Kennedy group, between the Anchor and Alliance, is being worked through the 500-foot tunnel. A shaft from the tunnel level, to cut the vein, is being sunk. The water-pipe connections at the new custom concentrator (the Union) have been made, and the concentrator will begin operations Monday morning on Woodside second-class ore. Hughes & Bogan are developing their Woodbine group toward the head of Woodside gulch on the west by a tunnel which is in 140 feet. The prospects are encouraging, although they are working in a red shale formation.

OTHER LEASERS.—John Farish started a force of men to work on his Kerr group, near the Ontario, a few days ago. Two shifts are employed at the Wasatch leased property opening up the vein and prospecting new ground. The Uncle Harry leasers are working their property by tunnel and incline, now about 100 feet under the surface. The leasers shaft on the Nevada and Northland is down about 50 feet already, but they calculate to go down 200 feet before drifting.

ORE AND BULLION SHIPMENTS. — During the week the Crescent shipped 72,000 pounds of concentrates, but no first-class ore. For the week just ended the Mackintosh sampler received 607,950 pounds of Ontario ore; 157,930 of Daly; 76,320 of Mayflower No. 7 leasers'; 70,200 of Alliance; and 61,630 of Woodside ore; total, 974,030 pounds. The Ontario bullion shipment for the week was 42 bars, containing 21,465 fine ounces of silver.

ONTARIO.—The middle of the week sinking in No. 2 shaft of the Ontario from the 1260-foot point was resumed after a cessation of work for a few weeks. The steam pumps below the 1000-foot level are working satisfactorily and are capable of handling the big flow of water.

MECHANICAL PROGRESS.

Crude Petroleum for Manufacturing Purposes.

The Aerated Fuel Company of Springfield, Mass., says the *Scientific American*, have many forges, muffles, ovens and similar fires, using over 1500 burners, in operation, in which the fuel is crude Lima oil, burned by being atomized with a governed air pressure, very similar in quality to natural gas, and free from danger. The advantages claimed are, no increased rates of insurance, no odor, no chimney connection needed, no sulphur or other impurities, perfect combustion and regulation, and cheaper than any fuel, not excepting natural gas, unless the consumer owns his own wells. One pound of oil will do the work of from three to six pounds of the best hard coal in forges, and do it better, with less liability of overheating or burning stock.

The system can be adapted to nearly any forge now in use, but as it is necessary to use from 10 to 25 pounds air pressure per square inch, a compressor of some kind is necessary, as no fan blower will maintain this pressure. This process is already used for japanning, annealing, hardening, drop forging, shovel welding, heating blanks for bolts, riveting furnaces for boiler and bridge work, hoe, fork and rake work, cutlery works, mowing, reaping, harvesting, binding and hay-pressing machinery, scale work, railroad repair and locomotive works, glass and copper works, etc. At the repair shops of the Boston and Albany Railroad Company, at Springfield, Mass., where this system is generally employed, the superintendent states he regards the system as far superior to coal in every respect, particularly for work requiring a high degree of heat at short notice.

The literature of the subject of liquid-fuel burning is in one sense more extended than is suspected, and it would, perhaps, surprise some of our readers if they knew how thoroughly the ground had been traversed by inventors, and what a great number of devises for burning liquid fuel has been tried. There is really very little practical difficulty in burning this fuel. It is all a matter of expense, safety and conditions."

Growth of Marine Engineering.

The enormous size that modern marine engines have reached can hardly be believed by those who have not watched the growth of them during the last few years. The City of Rome's engines have six cylinders, three of which are over seven feet in diameter, and they indicate 11,890 horse-power. The Etruria and the Umbria each have three cylinders, two of which are nine feet in diameter, and the remaining one six. Thanks to these monsters, the Atlantic ocean has become a great ferryway, and the voyage that once required over a month has been made in 6½ days. None of the celebrated Alantic mail steamers have triple expansion engines, but two large vessels that are now building are to have triple engines with forced draft. They are to develop 18,000 horsepower, and are expected to eclipse all of the others in point of speed. Two vessels of the present navy of Italy develop 18,000-horse power, and two others, now building, are to develop 19,500. But the most wonderful marine engines yet designed are those of the Sardegna, which are to comprise 12 main cylinders, arranged triple expansively, and are to develop 22,800-horse power. This vessel, in all, is to contain 62 engines, comprising 90 cylinders.

In this connection it may be remarked that the growth of the steamship interest in Great Britain, and how it is displacing the tonnage of the United States in the carrying trade of the ocean, appears unpleasantly conspicuous from the report of the annual meeting of the Chamber of Shipping of the United Kingdom, just held in London. The president, in the customary address, said that the statistics of last year showed that 35 iron steamers were built or in process of construction, against 57 in 1886, and 256 of steel, against 137; as to sailing vessels, 12 of iron, against 39, and 18 of steel against 11. From these figures he concluded that steel as a material in the construction of vessels was rapidly superseding iron; that sailing vessels, even of larger type, were found unable to compete with the newest type of steamer, and that composite and wooden sailing vessels for mercantile purposes had ceased to be built.

HOW TO PRODUCE SKILLED MECHANICS is the subject of special inquiry by Pres. G. W. Atherton of the Pennsylvania State Agricultural Commission, recently appointed by the Governor, and who is about leaving for Europe in pursuit of information. Of his plans and purposes he says: "The object of the commission is to create public sentiment. Our work is divided under three heads—the need of manual training in the public schools; how this need has been supplied in other countries, and how far it would be feasible to go in combining in the public schools intellectual and industrial education, without the latter interfering with the former. The system has been introduced in the schools of Chicago, St. Louis, Philadelphia, New York and Boston. In England, and on the Continent, the plan has been in operation for a number of years. The result shows that the boys who have been trained in this way become more proficient than apprentices who have worked at a trade during the same length of time. The object is not to teach trades, but to educate the hand and eye in those mechanical processes that prepare the boy to become a better mechanic when he undertakes to learn a particular branch in any of the great industries of the world. When we meet again next fall to compare notes and the results of our information, we propose to present to the legislators a well-digested plan to guide them in framing a proper bill." The establishment of a university for artist artisans is proposed, so that a piece of brass shall not be looked upon altogether from a mercenary point of view, but be converted into an article of beauty, and the United States be enabled to vie with France in the development of artistic skill in the treatment of metals.

PROFITS OF IRON AND STEEL MANUFACTURERS.—A manufacturer of not less than 25 years' experience, who has been reasonably frugal, and who has acquired but a modest competence to represent that long term of hard work and risk of capital, recently sought to make a sale of iron to a consumer who, in less than half that time, had swollen his capital of $25,000 to over $2,000,000. He was not told that his prices were higher than those made by competitors, but that all prices of iron were still too high and would have to be reduced; iron manufacturers in this country were making entirely too much money and must cut down their profits. If they refused to do so willingly they would be obliged to do so against their wills. The immense fortune which had been accumulated by the consumer in question was evidence in itself that so far as the price of his own products was concerned he had taken good care to see that it was high enough. The view of the iron trade taken by this man it not exceptional, or it would not be worth stating. On the contrary, there are many consumers who express themselves in the same way, and, further than that, they endeavor to depress prices by various means, in order to force values down to the level which they insist should obtain.—*Iron Age.*

THE NEW GERMAN METAL, known as germanium, is described as having a great resemblance to antimony, though distinguished by certain well-marked reactions. It is found that if the sulphide is heated in the absence of air, that is, in a current of hydrogen, it forms a blackish crystalline sublimate, which, at a higher temperature, melts to brownish-red drops; this sulphide dissolves in ammonium hydrosulphide, and is again precipitated with a white color by hydrochloric acid, and is again redissolved by ammonia. If arsenic or antimony is present, the color is yellow; if heated in air, or treated with hot nitric acid, white germanium oxide is formed which is not volatile at a red heat. The oxide dissolves in potassium hydroxide. If this solution is slightly acidified, it gives a white precipitate on treatment of hydrogen sulphide. The oxide is easily reduced by hydrogen, the sulphide less easily. The metal is gray, volatile at a full red heat, though less readily than antimony; the vapor deposits small crystals, resembling those of iodine, which do not melt; in a current of chlorine the metal yields a white chloride, which is more volatile than antimony chloride. Such are some of the characteristics of this curious new metal.

AMERICAN IRON-WORK ABROAD.—The London *Iron and Steel Trades Journal* states that "the United States are serious competitors of Great Britain in the matter of the iron-goods importation in the Philippine islands. Germany, Belgium, and also France, make strenuous exertions to secure a due proportion of such trade, and consequently there is a good deal of competition going on." Great Britain, however, it adds, "still maintains her pre-eminence over all others in one class of iron goods—corrugated iron—that material being supplied by our exporters at prices with which foreigners can hardly hope to compete. A great many carriage axles and springs are used in Manilla, and the supply of those is derived from Great Britain and United States, no other country competing."

AMERICAN MACHINERY ABROAD.—It is a remarkable fact, observes the *Iron and Steel Trade Journal*, London, that in the manufacture of different kinds of machinery the Americans can beat us in price. Wages in the United States are about 50 per cent higher than in this country; materials are from 25 to 50 per cent dearer; yet the finished machinery can be put on the market cheaper. It is true that the Americans cannot send out machines to neutral markets any cheaper than is done by our manufacturers; but it is surprising that they can at least meet us in price. This fact is undoubtedly due to the superior methods in the shops of this country, and particularly to the more general substitution of machinery for hand-power.

MALLEABILITY IN IRON is of great use in many ways, and this gave charcoal iron peculiar value; puddling iron is a process to make it malleable without its being taken directly from the ore. In 1882, out of 4,200,000 tons produced in the United States, 2,500,000 were puddled. But puddling is rapidly declining since the introduction and use of soft steel.

WELDING VS. RIVETING.—The use of rivets for seams in boiler-making will soon very generally give way to the cheaper and more effective method of welding by electricity.

SCIENTIFIC PROGRESS.

The Nature of Electricity.

The question, What is electricity? appears to have been satisfactorily answered by Herr H. Hertz, who, it will be remembered, last year succeeded in experimentally demonstrating the undulatory transmission of electrical inductive action through the air and in conduits. Herr Hertz has since made some further experiments, the results of which he has communicated in a paper to the Berlin Academy of Sciences. The rays of electricity are created by a special arrangement, and their presence and effects are shown by a resonator, the latter of which it is Hertz's special merit to have invented. Concave mirrors of zinc plate, which he employs, act on the electric rays as they would on rays of light, and by manipulating these rays all the elementary experiments usually made with rays of light can be repeated. The electric ray shows itself capable of being rectilineally polarized; it is diffused in a rectilinear direction, is reflected regularly like a ray of light, and undergoes, in passing through a prism of so-called hard pitch, a refraction which gives for the material an index of refraction of 1.69. This agrees most singularly with the optical refraction exponent, ranging between 1.5 and 1.6, as given for bodies belonging to the resin family. Herr Hertz, therefore, thinks himself justified in describing electrical rays as rays of light of very great undulatory length, and he concludes his paper as follows: "The experiments described appear to me to be greatly instrumental in removing doubts as to the identity of light, radiant heat, and electro-dynamic undulatory motion. I believe that in future we may confidently utilize the advantages arising from the acceptance of this identity, both to the domain of optics and to electrical science."

Dr. O. J. Lodge has also been making investigations on a similar direction. He holds that light, is an electrical vibration of ether, and has been endeavoring to produce these waves by direct electric action without the intervention of heat. The means adopted was the oscillating discharge of a Leyden jar, with a rate of vibration as high as 1,000,000 per second. The waves thus obtained were about three yards long, but, according to Dr. Lodge, were light in every particular except wave length. To reach the wave length of light, they would require to be shortened from three yards to the hundredth thousandth of an inch. The electric waves of Dr. Lodge travel through space at the same speed as light, and are refracted and absorbed by material substances according to the same laws. Hence Dr. Lodge concludes that if we can generate electric waves sufficiently small we may entirely revolutionize our present modes of obtaining artificial light.

CURIOUS SUPPOSED EFFECT OF THE EIFFEL TOWER.—A Paris correspondent of the New York *Tribune* says: "The Eiffel tower is said to have changed the climate of Paris. As a matter of fact there has been coincident with its existence a marked climatic alteration. We have an amount of sultriness, followed by heavy rainfalls and thunder-storms, which is, to say the least, abnormal. Nights are hotter than I ever felt them before, and New Yorkers find them quite as hot as any they remembered in their own city. It is true that, apart from the sprightly crowd at the Champ de Mars, there is something peculiarly exhilarating in the atmosphere there. Is this because the tower is, like Jupiter, a collector of clouds charged with electricity and productive of thunderbolts? Scientists have not yet said their say. But it stands to reason that when the key at the end of Franklin's kite-string was able to draw down a thunderbolt, the vast mass of iron which springs to the hight of 380 yards into the sky, rather in form of a steeple than a tower, ought to attract to it electricity in proportionate quantities and from great distances. I have been a good deal to the Champ de Mars and never lost an opportunity to mount the tower. I have noticed from it that it is the rendezvous—to speak in a figure—of storm spirits, and, indeed, a kind of vortex into which they rush. When they do this they get unruly, and behave like mad things. As the witches say in "Macbeth," they meet in "thunder, lightning and in rain." Nevertheless, there has not been a single electrical accident on or about the tower.

TWO NEW COLORS are described in various recent technical journals. The first is apparently a reproduction of a color known to the ancients and made by them with sand and lime heated with roasted copper. The pigment, on analysis, appears to be a compound silicate of lime and copper. It is now made with exact proportions of the materials, so that the product is uniform, and the process seems likely to furnish us with a material of great value. The color is a bright greenish-blue so that it will be more available for decoration than French blue or cobalt blue, both of which are of a purplish cast and do not mix well with other colors, while it appears to be as permanent as either of them.

The other color is a black which has been made by treating camphor with sulphuric acid. By steeping camphor in strong sulphuric acid a jelly-like mass is formed of a reddish color. When this is heated it boils, giving off fumes of sulphurous acid, and turns intensely black. By evaporation the unconverted excess of acid and camphor is driven off and a black mass remains, which seems to have the qualities of India ink. Like India ink, it can be apparently dissolved in water, and remains suspended for a long time. We hope that some one will pursue the subject of this camphor-black. A pure liquid black is one of the things that science has searched for in vain for many years, and even so near an approach to it as good India ink would be a most useful substance.—*American Architect.*

NEWLY INVENTED MASTIC.—A French engineer recently discovered a new kind of mastic, which is already largely employed throughout France, and which has even begun to be exported in considerable quantites, especially to Eastern countries. The product, which, it is asserted, is indestructible, is composed of linseed oil, mixed with 93 parts of powdered brick, and 7 parts of litharge, the brick and the litharge being pulverized separately, then well mixed, and reduced to a paste by means of the oil. The object to which the mastic has to be applied should first be dampened with a sponge. After application, in say about three or four days, the coating becomes perfectly hard, and will effectually prevent the filtration of water in terraces, basins and masonry in general.

ENCOURAGING SCIENCE.—The Vermont Microscopical Association has just announced that a prize of $250, given by the Wells & Richardson Co., the well-known chemists, will be paid to the first discoverer of a new disease germ. The wonderful discovery by Prof. Koch of the cholera germ, as the cause of cholera, stimulated great research throughout the world, and it is believed that this liberal prize, offered by a house of such standing, will greatly assist in the detection of micro-organisms that are the direct cause of disease and death. All who are interested in the subject and the conditions of this prize should write to C. Smith Boynton, M. D., secretary of the association, Burlington, Vt.

ARTIFICIAL SUGAR.—A feat of much scientific interest, if not of immediate commercial value, is the recent production of chemical sugar by Fischer and Tafel, in the laboratory of the University of Wurzburg. Glycerine was used as the starting point in the experiments. After decomposition and treatment with various re-agents, a colorless syrup was obtained, which, unlike saccharine, appears to be a genuine sugar, acting in every respect like ordinary natural sugar, except in being incapable of rotating a beam of polarized light. The discoverers expect soon to give even the lacking optical activity to the new product, which is provisionally named acrose.

A SENSITIVE FLOWER.—A lovely flower, called the rice lily, grows thickly in part of southwestern Georgia. It is extremely sensitive to the light. The blossoms fold up at night, but open in the morning. At night, while the lovely white blossoms are closely enfolded in their purple covering and the flowers are asleep, if a lamp is placed near them they will gradually open and turn toward it. If a strong light is placed on one side of the vase containing them, the half of the bouquet that faces the lamp will be unfolded, while the other half that is in the shadow will remain tightly closed.

GLACIAL MOVEMENT AT MOUNT LYELL.—The Virginia *Chronicle* says: The great glacier on the northern flank of Mount Lyell in Mono county, near Lundy, has moved at least ten feet within a year. Last May parties built two monuments of rocks five feet high, one being placed at the edge of the ice, the other at a distance of 15 feet. The upper monument has disappeared and the lower one is but five feet from the ice. Accurate measurements from several permanent points show conclusively that the glacial movement northward has been considerable all along the line.

TIME.—One advantage of living in a small country like England is that one standard time serves for the whole country, namely, that of Greenwich. English time is therefore fixed by that of a point east of which very little of England extends, for the bulk of the British Isles lies to the west of Greenwich. In Ireland the standard time is that of Dublin, which is 25 minutes later than Greenwich, but Ireland is separated by sea from England, and no inconvenience results from the difference of time.

FROMENTINE.—A French chemist named Beaumetz exhibited at a recent meeting of the Paris Academy of Medicine a new alimentary substance which he names fromentine. It is obtained from wheat by the aid of special millstones, and is really the embryo of the wheat reduced to flour. It contains three times more nitrogenous substance than meat, and a large proportion of sugar. It is thought that it may advantageously replace powdered meat as a concentrated food. It may be employed for making soups, and even for making biscuits.

MODIFICATION OF CLIMATE IN DAKOTA.—Cultivation of the soil, planting of trees and the general improvement of civilization have already had a marked influence in modifying the climate of the southern section of Dakota. Old settlers on the east side of the Missouri say that within a few years the changes have been very decided, and that seeding is now begun a month earlier than formerly.

GOOD HEALTH.

How to Keep Cool.

As a matter of fact, says the Atlanta *Constitution*, common-sense persons need no advice on the subject. They are cool under all circumstances and conditions, unless it is when they run to catch a street car that has been sent off by a timekeeper who has no watch.

The way to keep cool is to keep good humored. There is no doubt that good-humored men are sometimes warm, owing to the fact that they are jolly and fat, but no one ever heard them complaining about the weather to any extent, unless it is when they get caught out in a shower without an umbrella.

The Washington *Post*, however, says that the way to keep cool is to eat sparingly of meat, but this is nonsense. The coolest and most agreeable person on earth is the meat-eater, and the most irritable and unhappy is the person whose digestion will not permit him to eat meat.

Eat lean meat—tender steak and chicken—with your vegetables, and you will have no trouble with the heat. Pork should be avoided, of course, but veal, mutton, and all the vegetables, pot liquor and dumplings, buttermilk and corn-bread, go to make up a dinner to be enjoyed.

Above all things, let ice alone. It is a most deceptive affair. It is not only the nidus of microbes and bacteria, but it is unhealthy even when it is pure. It paralyzes the stomach, ruins the digestion and leads to Bright's disease.

If you will drink, as you ought to, drink water fresh from the spring. If you want it seasoned, give it a touch of lemon and sugar, but let ice alone! Ice is much colder in the summer than it is in the winter, and is no more healthy at one season than at another.

We are giving some famous advice here; but the best thing, after all, is to keep in good humor. The good-humored man may get too hot occasionally, but it doesn't worry him—and the man who isn't worried cares little for the heat.

LADY DOCTORS IN INDIA.—In India lady doctors are now familiar to us, and although at first they may have been somewhat ridiculed by those who could not appreciate their value, they are fast making their presence felt for good in almost every corner of the land, says the *Englishmen's Overland Mail*. So far as the native women of this country are concerned, it is gratifying to note that their success in all branches of college education is progressing to the entire satisfaction of their professors. Not only have they proved themselves to be generally well fitted for the arduous duties attendant on medical studies, but they have in some cases succeeded beyond all ordinary expectation. Bombay, Madras, the northwest provinces and the Punjaub all return flattering reports on the subject, and when we say that a class of female students can average over 700 marks out of 1000 in a surgical examination, as we hear has recently been the case, little can be said against their power or skill or aptitude for gaining knowledge in one of the most important branches of the medical profession. Indeed it appears not unlikely that women in India may prove themselves by no means inferior to men in most branches of the practice of medicine, if the progress made by native females in hospital work may be taken as a criterion. In many cases they have proved themselves superior to male students in college examinations, and in no way behind them in application, power of reasoning and resource. The fact that much of their success is due to the great interest taken in their studies by their lecturers and professors is not without a certain special significance.

KEEPING WARM.—It may not be generally known that, when exposed to severe cold, a feeling of warmth is readily created by repeatedly filling the lungs to their utmost extent in the following manner: Throw the shoulders well back, and hold the head well up. Inflate the lungs slowly, the air entering entirely through the nose. When the lungs are completely filled, hold the breath for ten seconds or longer, and then expire it quickly through the mouth. After repeating this exercise while one is chilly, a feeling of warmth will be felt over the entire body, and even in the feet and hands. It is important to practice this exercise many times each day, and especially when in the open air. If the habit ever becomes universal, then consumption and many other diseases will rarely, if ever, be heard of. Not only while practicing the breathing exercise must the clothing be loose over the chest, but beginners will do well to remember, in having their clothing fitted, to allow for the permanent expansion of one, two, and even three inches, which will eventually follow.

THE THOUGHTS OF THE DYING.—At a meeting of the French Society of Biology, M. Fere affirmed that a dying person in his last moments thinks of the chief events of his life. Persons resuscitated from drowning, epileptics with grave attacks, persons dying and already unconscious, but momentarily brought back to consciousness by other injections to utter their last thoughts, all acknowledge that their last thoughts revert to momentous events of their life. Such an ether injection revives once more the normal disposition of cerebral activity, already nearly extinguished, and it might be possible at this moment to learn of certain important events of the past life. Brown-Sequard mentions the remarkable fact that persons who, in consequence of grave cerebral affections, have been paralyzed for years, get back at once when dying their sensibility, mobility and intelligence. All such facts clearly show that at the moment of dissolution important changes take place, reacting upon the composition of the blood and the functions of the organs.—*Wien Med. Zeitung.*

COLOR OF EYES AND HAIR.—M. Topinard has been making a statistical inquiry into the color of the eyes and hair in France, and from his 180,000 observations he deduces many interesting results, one of the most curious being that where the race is formed from a mixture of blondes and brunettes the hereditary blonde coloring comes out in the eyes and the brunette element reappears in the hair. To this tendency probably is to be attributed the rarity of a combination of light hair with dark eyes. Several observers have asserted that the American people, who are pre-eminently a mixed race, are becoming a dark-haired and blue-eyed nation, and if this be true, such a development must be owing to the working of the law formulated by M. Topinard.

DEATH FROM STREET CAR ACCIDENTS in this city from February 1, 1885, to May 1, 1889—four years and three months—aggregate 27, as follows: Sutter street line, 7; Union street, 6; Fourth street, 5; Market street, 2; Omnibus line, 2; Potrero cars, 1; Taylor street, 1; Ocean beach, 1. Of these, 16 are due to cable cars and 11 to horse cars. In addition to the above, 3 persons were killed in this city by Southern Pacific trains, 12 by street trucks, and 8 by wagons, making 54 in all.

TO REDUCE WEIGHT.—One of the easiest ways to reduce weight is to wear a short flannel sweater and ride on a brisk trot. If the horse trots roughly and the rider bounces up and down in the saddle, so much the better. Ten pounds a week can be lost by this process. The best kind of a sweater is made by taking four, six or eight thicknesses of flannel and wrapping them around the loins and lower part of the chest. The upper chest should be left free.

DEATH FROM MINING EXPLOSIONS in England for 1888 were only 43. This is the lowest record since 1851, when the number was first officially given. The lowest previous to 1888 was 65 deaths in 1884. The highest record in the past 33 years was in 1866, when 650 lives were lost by explosions, 360 of these being covered by one casualty at the Oaks colliery.

USEFUL INFORMATION.

ARTIFICIAL SILK.—It is said that Mr. Chardonnet has succeeded in preparing a new artificial silk—a silk which bears the same relation to the natural article as celluloid does to ivory. Its preparation is somewhat as follows: Cellulose (cotton or whatever may be available), after being treated with a mixture of nitric and sulphuric acids in equal proportions, as for the making of gun cotton, is dissolved in a mixture of alcohol and ether, to which is added some perchloride of iron or protochloride of tin and tannic acid. The solution thus obtained is placed in a vertical vessel terminating in a small tube or in a diaphragm pierced with fine holes, so that it can run out into a vessel full of water slightly acidulated with nitric acid. The fine fluid filament which comes out takes on immediately a more or less solid consistency, and forms a thread, which can be wound on a spool. The thread thus obtained resembles silk very closely, and is equally strong and elastic. It is not attacked by water, cold or warm, nor by the acids and alkalies moderately concentrated. By introducing into the solution coloring materials, one may obtain threads of any desired shade. This artificial silk is said to be extremely inflammable—an objection which it is hoped to overcome. It is probable that the nitric acid can be replaced by some other which will render it less combustible. When this progress has been realized, we shall have a new textile fabric of the greatest importance.—*N. Y. Mail.*

A NEW NON MAGNETIC ALLOY.—A new alloy has recently been brought out in Geneva, Switzerland, by Messrs. Osterman and Lacroix, to be used as a substitute for steel in the manufacture of different parts of watch mechanism, such as, for example, hair springs, and balance wheels which are apt to cause a good deal of annoyance through becoming magnetized. The alloy we need, therefore, perhaps scarcely say is claimed to be non-magnetic. It is made up from 30 to 40 parts of gold, from 30 to 40 parts of palladium, 0.1 to 5 parts of rhodium, 10 to 20 parts of copper, 0.1 to 5 parts of manganese, and the same proportion of silver and of platinum. The copper and manganese are first mixed, after which the other metals are added, or all the metals may be put into a crucible at the same time, the manganese being used for the bottom layer.

HOW TO BORE A HOLE IN A PIN.—Place a pin in the end of a cork, in each side of which a penknife has been inserted obliquely. The knives should be as nearly as possible of equal weight. By opening one or the other of them more or less, they can be made to balance. In order to bring them to the exact position required—that is, to bring the pin, the cork and the knives to a horizontal position—place the head of the pin on the end of your finger and ascertain if the two knives are on the same level. If not, adjust them until they are so. Then take the cork in your hand and lay the stem of the pin on the point of a needle, the head of which is fastened in the cork of a bottle. You must carefully change the point of support of the pin until you have found that position in which it remains perfectly horizontal when left to itself. Now blow upon one of the penknives, at first gently and then more strongly. You will thus cause the whole to rotate rapidly. After a time the needle, being the harder, will have worn a tiny hole in the pin, and if you continue the experiment will finally pierce it entirely. The experiment can also be made by placing the pin in a cork in the direction of its axis while the needle penetrates it perpendicularly. The equilibrium is then obtained by means of two forks, as in the experiment of the egg.—*N. Y. World.*

PRESERVATION OF MEAT BY SUGAR.—It results from a special report made to the French Minister of Agriculture that sugar is an excellent agent for preserving meat, and possesses some advantages over salt. In fact, salt absorbs a portion of the nutritive substances and of the flavor of meat. When an analysis is made of a solution of the salt dissolved by water contained in meat, we find albuminoid bodies, extractive substances, potassa and phosphoric acid. Salt deprives meat of these substances so much the more readily in proportion as it enters the tissues more deeply or acts for a longer time. It then results that the meat, when taken from the saline solution, has lost nutritive elements of genuine importance. Powdered sugar, on the contrary, being less soluble, produces less liquid. It forms around the meat a solid crust, which removes very little water from it and does not alter its taste. Thus preserved, it suffices to immerse the meat in water before using it. Although this treatment costs a little more than preservation by salt, account must be taken of the final result and of the loss prevented, which offsets the difference in cost between the two preservative agents. We think that navigators might profit by this.—*Marine Merchande.*

CELLULOID FOR SHEATHING SHIPS.—Among the various uses of celluloid, it would appear to be a suitable sheathing for ships, in place of copper. A French company now undertakes to supply the substance for this at nine francs per surface meter, and per millimeter of thickness. In experiments by M. Butaine, plates of celluloid applied to various vessels in January last were removed five or six months after, and found intact and free from marine vegetation, which was abundant on parts uncovered. The color of the substance is indestructible; the thickness may be reduced to 0 0003 meter; and the qualities of elasticity, solidity, impermeability, resistance to chemical action, etc., are all in favor of this use of celluloid.

RECIPE FOR PLASTERING OUTSIDE BRICKWALLS.—The following is a good recipe for plastering on the outside of a brickwall: Take of slacked lime 60 parts; sand, 35 parts; litharge, 3 parts; knead and work the ingredients into a stiff mass with 7 to 10 parts of linseed oil; use old oil or linseed oil varnish. It should be well worked to the consistency required and applied as other mortars, well troweled down. Or, sand, 90 parts; litharge, 5 parts; plaster of paris, 5 parts, moistened and worked together with a small proportion of linseed oil. Oil the brick three coats before applying the cement, and trowel down.

USEFUL CEMENTS.—For mending valuable glassware, use a cement made with five parts gelatine to one part of a solution of acid chromate of lime. Cover the broken edges with the cement, press the parts together and expose to sunlight. The light hardens the cement, which will then withstand boiling water. For sticking leather, paper or wood to metal, use glue to which has been added a little glycerine—say a teaspoonful of glycerine to a gill of glue. This is a good cement for fastening labels to cans.

CAR BUILDING is becoming an important industry in Stockton. Orders are received from all parts of the Pacific Coast. The work of the present summer embraces orders from Portland, Spokane Falls, Sacramento, Fresno, etc. The business is carried on at the Combined Harvester and Agricultural Works, under the immediate charge of S. W. Elliott. The style of wood turned out is of a superior kind. There is no need that our railroad builders should go East for their cars.

THE KANGAROO, it is said, is in danger of being exterminated. Its skin is so valuable that large numbers of young kangaroos are killed, and high authorities are of the opinion that, unless the process is stopped, Australians will soon have seen the last specimen of this interesting animal.

GLASS FURNITURE is manufactured especially for India, where the rajahs like glittering and showy rooms. Glass bedsteads and chairs, huge glass sideboards and other articles of domestic use are made to suit Oriental taste.

ENGINEERING NOTES.

Importance of the Florida Ship Canal.

A company has been incorporated to construct this canal with a capital of $60,000,000. It is claimed to be entirely feasible, its use saving from 800 to 900 miles in a passage from New Orleans to New York, and the same between all other Gulf and Atlantic ports. It would also save nearly as much on European voyages from the Gulf ports. It would also save the hazard of navigation around the keys of Florida, than which, it is asserted, there is no ocean route more dreaded. To give a pecuniary estimate of this hazard, it was shown in a Congressional investigation that, for the 11 years prior to 1872, the loss by wrecks in passage around the peninsula of Florida amounted to $22,000,000. The saving in cost of navigation, and in freights, as well as insurance, by the use of a canal, can be readily estimated by practical men. Whatever it might be to-day, it would not fail to grow from year to year with the expanding trade of the country.

The *American Economist* says: The importance of opening such a canal has been, from time to time, confirmed by foreign as well as American observers. A report of the Russian Government says: "By the construction of the Florida ship canal the cost of the transport of grain from the Mississippi valley to Liverpool will be diminished more than 50 per cent;" that "it will render the United States the absolute controller of the prices of grain in the British markets;" that Russia would be utterly unable to compete with her." British reports declare that "the Florida ship canal will establish direct trade between the Mississippi valley and Europe."

Evidences are frequent of late that the great West is looking more and more earnestly for available outlets by way of the Gulf ports. The sharp competition which is involved in the successful distribution of the immense and rapidly growing products of the Mississippi valley, will inevitably compel the utilization of all practicable water-ways to reach the coast, and thence the shortest and cheapest routes to foreign markets. An inspection of the map of the United States in relation to the commerce of the Mississippi valley, demonstrates the national importance of the proposed ship canal. It would cheapen the transportation between all Atlantic and European ports and the Gulf ports. It would also cheapen the transportation from Atlantic ports to the west coast of South America. It would be of but little less importance to the commerce of the Western world, than the Suez canal is to Europe and Asia, and the time is not far distant when its construction will be demanded by the people of the United States as an indispensable measure for the promotion of the prosperity of the whole country.

TRANSMISSION OF POWER BY VACUUM.—London *Industries* says that the company in Paris for the distribution of compressed air for working clocks, and also for motive-power purposes on a large scale, has a rival in a company which sells power by means of rarefied air. The works are situated in the Rue Beaubourg, and were established in 1885, and contain three steam-driven air-pumps, which produce in the network of distributing pipes converging at the station a vacuum of about 20 inches of mercury. The motors at the subscribers' premises are similar in construction to small steam engines, and work by reason of an excess of pressure of the atmosphere over that in the exhaust pipes. There are in all some 150 motors at work, varying in power from a half horse-power to 2½ horse-power, and the greatest distance from the station 2500 feet. One of the directors of the company has recently read a paper before the Paris Society of Civil Engineers, in which he gave the efficiency of these vacuum motors at 81 per cent, but the system is obviously only applicable over small areas, and can, therefore, not compete with the system of compressed-air distribution over large areas. An attempt to utilize rarefied air for working dynamos, and thus supply electricity from the station in the Rue Beaubourg, has failed, owing to the low efficiency of the system as a whole and the complications it entails. The company have, therefore, installed at their station dynamos and separate engines for the direct distribution of current, and this machinery is worked in the evening, while the vacuum pumps are worked during the day.

TO WHOM THE CREDIT IS DUE.—Whenever an ocean steamer succeeds in breaking the record, the daily press, and the public generally, says the Boston *Journal of Commerce*, heap their praises on the captain, who "modestly" receives them. But not a word is said about the engineer to whose vigilance more than that of the captain the result is due. The British Government looks at the matter in a different light, and is ready to give honor to whom honor is due. Engineer Burke of the British man-of-war Calliope, the only vessel which escaped from Apia harbor during the great storm there, has been promoted to be fleet engineer in recognition of his services in enabling the vessel to steam out of the harbor.

THE covered bridge at Pavia, over the Ticino, is 500 years old. The roof is held by 100 granite columns.

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W. B. EWER.....SENIOR EDITOR

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Roof Paint—Carbon Paint Co.
Two Steam Engines for Sale—Judson M'f'g Co.

☞ *See Advertising Columns.*

Passing Events.

The Commissioner of the General Land Office has made a very important decision affecting those foreign mining companies which acquired title through their managers. In the case referred to the manager of a foreign corporation applied for and secured a United States patent for a mine. The mine was jumped and the title was contested on the ground that he had obtained the patent for the company, and a foreign corporation cannot enter land. This view is upheld by the Commissioner, notwithstanding the patent had been issued for years.

A cloud-burst on the Klamath river has done great damage to the dams and wheels of the miners for a long distance down the river.

Secretary Windom has taken a middle course in the matter of imposing a duty on silver ores containing lead. He has not decided at all on the question of duty, but has issued instructions as to the method of sampling ores on the frontier.

Government surveyors are in camp at Donner lake, and will locate reservoirs and ditches and estimate construction of works for storing water in that vicinity.

It is expected that the U. S. Debris Commissioners will visit Nevada county very shortly with a corps of assistant engineers to make surveys for ascertaining the practicability of building restraining dams, estimate the auriferous gravel yet unworked, etc.

An Unsurpassed Record.

Every now and again the prediction is made that some newly discovered mine bids fair to eclipse the famous Comstock mine of Nevada. "The ore is just like it. The width is unknown. The characteristics are similar, and when depth is attained, it is expected to furnish better ore." This all sounds very well, but none of the predictions have been verified or ever come anywhere near verification. In the first place, the Comstock does not consist of a mine, but a big lode, on which there are numbers of mines, each with independent records. Some of these have never paid a cent to their owners; and others have paid out fortunes. There are mines on the lode which have been worked constantly for years and never yielded enough to pay expenses.

One mine alone has a record unsurpassed by any in this country. This is the Consolidated California and Virginia. This was originally one mine, was divided into two, and again consolidated as one. The last dividend was declared on the 3d instant, and was No. 28 of the consolidation. Of these, one declared in January, 1886, was 30 cents per share, and the balance 50 cents per share each, beginning January 3, 1887, making a total of $3,024,000 paid since the ore discovery in October, 1886, and $3,088,800 since the consolidation of the California and Consolidated Virginia mines under the present title.

Prior to the consolidation those mines paid nearly $102,000,000 in dividends to shareholders, making a total of $105,088,800 paid in dividends from bullion realized from ore extracted within the boundaries of the Consolidated California and Virginia mine. Of that vast sum $100,000,000 was disbursed to shareholders in less than four years.

The dividends paid since 1886 by the company aggregate a total of $13.85 per share—nearly double what the stock is now quoted at.

This is only the record of one mine on the Comstock lode, and there are many others which have disbursed millions in dividends. This record is of dividends, not production. During all this time the expenses have been enormous. Magnificent machinery has been purchased and the mine fully equipped in every way.

In some of the newer camps, particularly those in the Northwest, when a mine has paid a few hundred thousand dollars in dividends, it is held up to public inspection as a second Consolidated California and Virginia. But all of these have got a great deal to do yet to show a record one-quarter as good. Of course it may be said that these new mines have yet to pay their profits, while those of the Comstock mine have been paid. This argument would be better if the Cons. Cal. and Va. had stopped dividends, but it has not by any means.

Thus far no "second Comstock" has been discovered in this country, nor has there been a second Consolidated California and Virginia.

SUTRO TUNNEL.—On last Monday the right for redemption of the Sutro tunnel, Virginia City, Nevada, expired, and consequently the mortgagees intend taking action in court to secure possession of the property. When they come legally into possession of the tunnel, they will form or reorganize a new company and formulate plans for the future. It is generally understood that no new work can be or will be commenced by them previous to October of this year.

THE MINT CLOSED.—The transfer and counting of between two and three millions of gold coin from the Sub-Treasury to the Mint will delay the opening of the latter institution under General Dimond's administration until August 1st. No new appointments will be made or business transacted before that date.

IF the Puyallup reservation can be sold at the present value of land, each Indian will receive $20,000 in cash.

American Mineral Products.

On pages 42 and 43 of this number of the PRESS is given an abstract of the result of the work of American miners last year. The showing is a magnificent one and exhibits clearly the progress made in this branch of industry. The statistics have been carefully gathered under the superintendence of Mr. David T. Day, who has proven himself well adapted to his task, taking great personal interest in the work and carrying it out skillfully. The following figures show in condensed form the production of mineral substances in the United States last year:

METALLIC PRODUCTS OF THE UNITED STATES IN 1888.

	Quantity.	Value.
Pig iron, spot value, long tons ...	6,489,733	$107,000,000
Silver, coining value, troy ozs...	45,783,632	59,196,000
Gold, " " " " ...	1,604,927	33,176,000
Copper, value at N. Y. City, lbs.	231,270,622	32,333,954
Lead, val. at N. Y. Cy, short tons,	180,555	15,924,951
Zinc, val. at N. Y. Cy, short tons,	55,903	5,506,855
Quicksilver, val. at S. F., flasks..	33,250	1,413,125
Nickel, val. at Philadelphia, lbs,	195,182	115,518
Aluminum, val. at Phila., lbs...	19,000	65,000
Antimony, val. at S. F., sh. tons,	100	20,000
Platinum, value (crude) at N. Y. City, troy ounces.....	500	2,000
Total.....		$256,245,403

NON-METALLIC MINERAL PRODUCTS OF THE UNITED STATES IN 1888 (SPOT VALUES).

	Quantity.	Value.
Bituminous coal, long tons.....	91,106,998	$122 497,341
Penn. anthracite, " "	41,624,610	89,020,488
Building stone.....	.....	25,500,000
Lime, barrels.....	49,087,000	24 543,500
Petroleum, barrels.....	27,346,018	24,598,559
Natural gas.....	.....	22,662,128
Cement, barrels	6,253,295	4,533,639
Salt, barrels	8,056,381	4,377,204
Limestone for iron flux, long tons,	5,438,000	2,719,000
S. C phosphate rock, long tons..	433,705	1,951,673
Zinc-white, short tons.....	20,000	1,600,000
Mineral waters, gallons sold	9,628,568	1,709,302
Borax, pounds.....	7.589,000	455,340
Gypsum, short tons	96,000	480,0 0
Manganese ore, long tons.....	25.500	255,000
Mineral paints, long tons	24,000	380,0.0
New Jersey marls, short t ns....	600,000	300,000
Pyrites, long tons.....	54,331	167,653
Flint, long tons	30,000	175,000
Mica, pounds.....	48,000	70,000
Corundum, short tons.....	589	91,620
Sulphur, short tons	.....	.....
Precious stones.....	.....	64,850
Gold quartz, souvenirs, jewelry, etc	.....	75,000
Crude barytes, long tons.....	20,000	110 000
Bromine, pounds.....	307,386	95,290
Feldspar, long tons.....	8,700	50,000
Chrome iron ore, long tons	1,500	20,000
Graphite, pounds.....	400,000	32,000
Fluorspar, short tons	6,000	30,000
Slate ground as pigment, l'ng tons	2,500	25,000
Cobalt oxide, pounds.....	12 266	18,441
Novaculite, pounds	1,500,000	18,000
Asphaltum, short tons	53,300	331.500
Asbestos, short to s.....	100	3,000
Rutile, pounds	1,000	3,000
Total.....	.....	$328,914,528

RESUME OF THE VALUES OF THE METALLIC AND NON-METALLIC MINERAL SUBSTANCES PRODUCED IN THE UNITED STATES IN 1888.

Metals	$256,245,403
Mineral substances named in foregoing table..	328 914,528
Total.....	$585,159,931
Estimated value of min l products unspecified,	6,500,000
Grand total.....	$591,659,931

Astronomical Society of the Pacific.

The next regular meeting of the Astronomical Society of the Pacific will be held in the library of the Lick Observatory, Mt. Hamilton, on Saturday, July 27th. Papers will probably be read on "The Eclipse of Jan. 1, 1889," by various members; "On the Eclipse of Dec. 21, 1889," by E. S. Holden; on "Observations of Jupiter," by E. E. Barnard.

The program for the journey is as follows: Members may take the earliest trains (broad gauge) from foot of Market street (via Niles), or from Third and Townsend streets, arriving at San Jose shortly before 10 o'clock on Saturday morning. They will be met at the station by stages. The start from San Jose will be made very promptly at 10 o'clock, in order to arrive at Smith Creek about 1:30. Here dinner can be had, and by starting promptly the summit can be reached about 4 o'clock. A meeting of the Board of Directors will be held in the library immediately on arrival, and as soon thereafter as may be, the meeting of the society will be called to order. The observing-rooms are not opened till 7 P. M., and the time after adjournment until then can be well utilized by taking a short walk to one of the neighboring summits, from which magnificent views of the valley can be had.

At 7 P. M. the domes of the 12-inch and 36-inch equatorials are opened, and all visitors take their turns in looking at the most interesting celestial objects which are in convenient situation. About 10 P. M. the visitors leave, and the members of the society will then have a further opportunity of seeing other heavenly bodies. As many of the members as can be accommodated by the astronomers resident at Mt. Hamilton will be personally invited to spend the night on the summit. The others must return to Smith Creek hotel in the stages, which will leave the summit about 11:30 P. M. At the hotel, rooms will be ready for members. The stages returning to San Jose leave Smith Creek about 8 A. M. and 1 P. M., in time to connect with the various trains to San Francisco. The expense of the journey to each person need not exceed $8.

Immediately on arrival at the observatory, each member should register his name in the visitors' book, and those who are to remain on the mountain over night should find their quarters and leave their luggage there. A list of the guests assigned to rooms at Mt. Hamilton is always posted on the blackboard in the library room.

Furnace Development.

Except in the old Catalan forge or its modifications, attempts to make iron and steel directly from ore in a practical and economical manner have failed so frequently that such schemes are looked upon with justifiable distrust. All have failed from one cause or another, although in some instances every indication of a practical success was at first manifest. Not long since, F. Lynwood Garrison of Philadelphia made a visit to Russia, and after observing the practical success of the furnace in the iron works of Count Stroganoff at Dobriansky, in the Government of Perm, he investigated the history of similar furnaces in Finland and Russia. His observations were read before the American Institute of Mining Engineers, and descriptions of the furnaces were given in the MINING AND SCIENTIFIC PRESS of Feb. 23d and March 2, 1889. The cuts given herewith on page 41 show the forms which led to the development of the Dobriansky and Wartrilia furnaces. One of the cuts shows the old type of furnace which has been in use in Northern Europe since pagan times. It should, perhaps, more properly be called a high-bloomary furnace or forge. It was with this type of furnace that M. Husgafvel began his experiments at Porsaskoske in 1875, but attempts to obtain better results with larger ones of the same type were failures.

A movable hearth of three-eighths-inch iron, lined with a mixture of clay, quartz and lime, was next tried, but was rejected for one of cast iron without any lining. By means of this movable hearth a continuous operation of the furnace was obtained. Two tuyeres instead of one were used, and the size of the furnace increased as shown in the cut, having been made in 1875. The productive capacity and economical results were thereby improved, but the product was not homogeneous.

To avoid certain difficulties and decrease temperature of the blast, the walls were made thinner and tuyeres cooled with water were inserted. The furnace thus altered was built at Pankakoske, Finland, in 1880, and is shown in one of the cuts. The results were superior to any previous ones, but irregularities in its operation could not be avoided.

In 1882 a furnace such as is shown in the figure was erected at the Porsaskoske Iron Works. The lower part was made of hollow cast-iron segments, so arranged that each segment formed a separate closed apartment, connected with its neighbor by a bent tube. The blast entered at the highest and made its exit from the lowest segment to the tuyeres, which were, as in the previous furnaces, inserted through the lowest segment. Observation holes, covered with glass, were arranged in the outer cast-iron wall, so that the degree to which the inner wall became heated could be observed. The furnace having been blown out a number of times, the condition of its interior could easily be determined, and it was found that the corroding action of the process affected but slightly the inner cast-iron walls, which had no lining. The greatest improvement in this furnace over the previous ones was, that the iron never stuck to the walls, and although the temperature in the lower part of the furnace was comparatively low (scarcely dark-red), a good welding heat was nevertheless predominant in the hearth. It worked, however, with only fair regularity.

The principles of this furnace were in 1884 applied to a larger one at the Wartrilia Iron Works, Finland. This furnace was illustrated and described in the PRESS of February 23d last.

MANY wells in the Big Bend country, Washington Territory, have gone dry recently.

Steam Schooners.

An industry which has of late years grown to large proportions in this city is that of building steam schooners or steamers intended for the coastwise trade. Last summer there were built in this city nearly 20 steam schooners for the Alaska trade alone, besides those for lumber ports. We give an illustration on this page of a type of steam vessel such as those for the Alaska fisheries and canneries. This was built by J. B. Jardine of the Atlas Iron Works. These schooners are supplied with ample sailing power so that they can make as good time under sail as ordinary vessels of that rig; and their auxiliary steam-power permits them to make good headway against the strong northwest winds which prevail on this coast in summer. They can also make their landings easily and handily and get in and out of harbor without loss of time or having to depend on wind or tide.

Should we ever get a canal through the Nicaragua route, we will in this city be in a position from the experience we are now gaining to get up such a "boom" in steamer building as the Clyde had after the Suez canal was completed. The whole Atlantic Coast wants our redwood, and we will need steam vessels with modern triple and quadruple expansion engines to carry our wine, wheat, fruit and other products to the more populous centers of the world.

While it is true that the majority of the vessels thus far built here have been comparatively small, larger ones can be built just as readily. The demand for the type most in use on this coast was very readily met, and when there is need of larger vessels for further development of distant trade it can be met as well. The steam schooners built in San Francisco are as good as any in the world. The Pacific is by no means pacific in these latitudes or farther north, and heavy seas with strong gales have to be overcome. It is conceded by all seafaring men that our local vessels are the best carriers possible, and they make good passages with great economy of fuel. Our builders have shown themselves masters of their business. Vessels built in this city are running alongside the steamers turned out from the crack Eastern yards and doing the same work for 25 per cent less expense.

The firm that built the steamer shown in our illustration is now at work on its thirteenth vessel and more are to come. Mr. Jardine has had good success with his steamers, having turned out from his shops some fine specimens of marine engineering. He is about to enlarge his business facilities so as to be able to build and fully equip steam vessels without outside assistance. Mr. Jardine's patent keel-condenser has attracted the attention of mechanics elsewhere, and some from the East and Australia have been negotiating with him for its use.

The Atlas Iron Works have also given a great deal of attention to mining machinery, and they are about putting on the market an iron-frame stamp-mill which we shall illustrate and describe shortly, as it seems to possess many good points. The works also do a general business in building all kinds of machinery.

FOR the month of June the output of the Drumlummon mine, Montana, was $126,200; working expenses, $53,000.

Vulcanized Rubber Belting—Butt-Splicing.

The testimony of the many who have used the vulcanized rubber belting manufactured by the New York Belting & Packing Company stamps it as unequaled in strength, durability and traction-power. Vulcanized rubber belting was first introduced by this firm some 40 odd years ago. In the matter of tensile strength, the superiority of belts made of this material has long been conceded, and is due to a webbing of cotton duck, through the meshes of which the rubber is driven by powerful machinery.

This duck is made expressly for the company by Brinckerhoff, Turner & Co., New York, and possesses more than double the strength of that used for ship sails. The rubber itself is prepared by an elaborate process. The sulphur used to vulcanize it is weighed with the greatest care and mixed with metallic oxides, making a semi-metallic compound that gives to the rubber a very considerable degree of firmness, and enables it to resist high degrees of heat, and at the same time does not reduce its elasticity too much. The different thicknesses of rubber used in the manufacture of a belt are laid over one another, so that by folding over the outside strip at the edges, a perfect, even and rounded edge is secured. In this form the thicknesses are passed between powerful heated rollers and afterward finished in a steam press.

Steam is let into the bed and platen of the press in a way that enables the engineers to control the temperature perfectly, and the pressure and heat are applied simultaneously to the rubber, while it is under the heaviest strain that it is designed to subject it to when working machinery. The fibers are thus pressed together as compactly as if steel instead of rubber and duck. The company makes this belting in any size desired, uniform in width and thickness. It will endure great heat and cold without injury, and is especially well adapted for service in wet or damp places, or where exposed to the action of steam. In addition to these advantages, the first cost of vulcanized rubber belting, especially for wide belts, is far below that of leather. This, with their greater ability for service and long endurance, makes them cheaper to the consumer than other belts.

In Fig. 1 we illustrate the manner of butt-splicing vulcanized rubber belting. The belt to be adjusted to the pulley (depending on the thickness of the belt) should be cut shorter than the distance around the pulleys by one-eighth to one-fourth of an inch for every foot when measured with a tape or string drawn tight. For narrow belts, make two rows of holes in each end, thus obtaining a double hold; butt the ends together and lace with lacing leather. For wide, heavy belts, the company recommend a riveted lap-splice, which is fully illustrated in Figs. 2 and 3. In Fig. 4 is shown a back-splice intended for wide belts, where the riveted lap-splice is not used. To make this splice, butt the ends, and, in addition, sew or rivet a piece of rubber belting on the back to strengthen the joint, equal in length to about one-half the width of the belt.

The principal factory of the New York Belting & Packing Co., and the oldest one engaged in the rubber business, is at Newtown, Conn. They also have another at Passaic, N. J. This company is the oldest and largest manufacturers of vulcanized rubber goods for mechanical

FIG. 1.



FIG. 2.



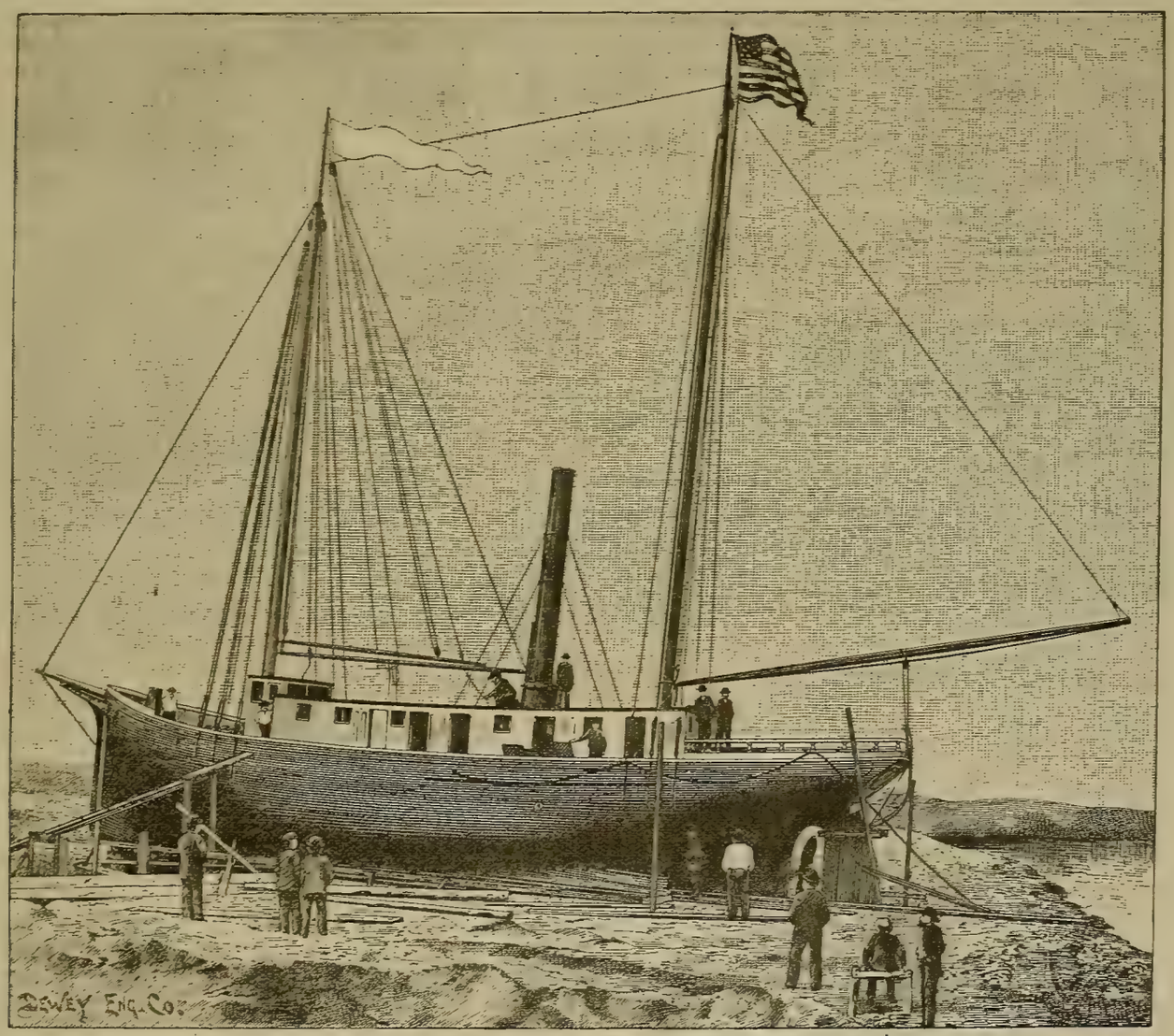
FIG. 3.



FIG. 4.



BUIT-SPLICING RUBBER BELTING.



TYPE OF STEAM SCHOONER FOR THE ALASKA TRADE.

purposes in the United States. Its office, salesrooms and warehouse are at No. 15 Park Row, New York City, directly opposite the Astor House. The firm has branches in all the principal cities of the country, and also representatives abroad. Mr. John H. Cheever is the treasurer of the company and general manager of the business.

STEAM BOILER NOTES

Why "Black Paste" Accumulates on Steam Chests and Cylinders.

Professor James E. Denton of the Stevens Institute, Hoboken, N. J., has been investigating this subject at the request of a number of dealers in lubricating oils, to discover whether it was attributable to the oil. The results of the investigation warrant the conclusion that the deposits are not attributable to any particular quality of the lubricant used, but arises from the admixture of solid matter with the lubricant, the solid matter being brought into the engine cylinder from the boiler by the steam, and precipitated from the latter by cylinder condensation.

Samples of deposits collected from locomotives and stationary engines in various parts of the country, and from marine engines, all showed the same average composition, viz., oil, combined with lime, lead, manganese, etc., 40 per cent; iron, 20 per cent; lime, magnesia, lead, zinc, copper, etc., 40 per cent. From these it was concluded that the oil and iron might be accounted for by the use of the lubricant and possible wear of cylinders, but that 40 per cent of foreign matter must come from the boilers.

A large compound blowing engine at an iron works broke its piston ring through the accumulation of a hard, black deposit under the rings. The same deposit was found throughout the cylinder passages and in the receiver. The oil used was the purest petroleum, yet the analysis of the deposit showed considerable animal oil. Upon investigation, it was found that the boilers took water from a stream just under a grating where there was always an abundant accumulation of all sorts of animal grease. The grease could only have reached the engine cylinders through the boilers.

The engine had not had its cylinders open for a long period, and the boilers were seldom cleaned, as the works ran night and day, and the plant was overloaded. The hypothesis that the boilers sent over foreign matter to the cylinder which contaminated the lubricant, was, therefore, further supported by this instance. Specific knowledge was accordingly sought of the condition of the interior of the boilers in the case of some engine making a deposit.

For this purpose the boilers of an Atlantic steamship were the best, and tests were made over a series of voyages. The highest grade of petroleum was used and the paste gathered showed about the same composition as above, and a change to a mixture of petroleum and a large percentage of the finest neatsfoot oil showed no marked change in the composition of the deposits. All evidence, therefore, was still consistent with the hypothesis that the miscellaneous matter in the cylinder deposits had their source in the boiler. Such matter must then go over with the steam, notwithstanding that by distillation water is ordinarily supposed to rid itself of impurities.

To settle the matter, condensed steam was collected in bottles and it was found contained 10 grains of solid matter to the United States gallon. The evidence tended to prove that the dirt in the cylinder originated in the lack of cleanliness of the boiler. This 10 grains per gallon would account for a much larger percentage of dirt than is actually found in the cylinder, and tests with a sectional boiler using very pure water were made and in seven months' use produced no deposit of any kind.

The general conclusion, therefore, is that deposits of "black gum," etc., in engine cylinders are not caused by absence of any proper quality in the cylinder lubricant but by the contamination of the latter with dirt, which may be furnished by the boiler if the latter in any way accumulates foreign matter upon its interior surfaces.

HOW STEAM-POWER IS WASTED.—The Westinghouse Machine Company recently sent experts equipped with the necessary instruments to visit a number of prominent manufacturing establishments in various parts of the country to test the consumption of power by each machine. As a rule, permission was readily obtained from the owners, they seeming much interested in the results, which are amusingly indicative of the carelessness shown in such matters. Nearly all were found to be wasting one-half their engine's power in doing other than useful work. One prominent establishment was wasting 65 per cent of its fuel and power; another was wasting 73 per cent, thus leaving only 27 per cent of the engine's power to earn money with. Another celebrated firm (known all over the West) was using a 60-horse power engine, of which 55-horse power was being consumed in dead work; thus leaving just 5-horse power with which to produce goods for sale.

TEMPORARY ENGINES.—When an accident to an engine takes place that makes a long shut-down probable, says a cotemporary, the substitute is usually of a peculiar type. A recent case came to our notice, an old slide-valve engine being hastily set up to drive a portion of the mill. The engine was set on beams resting on the ground. To render it firm and steady a heavy stick of timber was placed against the cylinder head and the wall, another to the cylinder and ceiling. The engine trembled and at each stroke shook as though it could not stand another, yet that engine has run a week and is expected to run another. It was overloaded, of course, and the belt slapping about clearly showed the excessive load, but what was also noticeable was the unison of the movement of the belt and engine. The belt would increase its slapping tendency with each stroke, and then gradually decrease for a few strokes and commence when again in unison with the beat of the engine.

SAFETY OF BOILERS.—A boiler may be inspected to-day and found to be safe under a working pressure of 100, and be weakened tonight by low water so as to be dangerous to-morrow with 50 pounds pressure. It may explode a month hence with 60 pounds pressure and plenty of water, but the cause is as certainly low water as if it had exploded when the water was low. There is but one sure remedy, and it is a simple one. Put on a safety water column, not some complicated device which is pretty in theory and worse than worthless in practice, or some untried and perhaps inoperative low-water detector, or a fusible plug which becomes coated with scale and fails to fuse, but a real safeguard, something simple, which has been tried and proven to be trustworthy by steam-users whose judgment can be relied upon.

THE USE OF MUD DRUMS.—Recently a mud drum in a boiler at the works of the Mahoning Iron Company, Youngstown, Ohio, gave way, causing the boiler to explode and wrecking four others in the battery. One man was killed and several others were severely injured. Why a mud drum is used in these times is hard to understand. They are put in as a place to deposit sediment, but it is very poor practice that will not say sediment should not be allowed to accumulate anywhere in a boiler. A two-inch blow-off properly set and used every few days will keep a boiler pretty clear of sediment. It weakens the boiler and is very liable to give out, causing an explosion as in above case. Mud drums should be abolished.—*Cotton, Wool and Iron.*

THE USE of crude petroleum for fuel under boilers seems to be somewhat on the increase. The last steam plant to be fitted up for that purpose belongs to the Boston & Albany Railroad, which generally investigates thoroughly the merits of an article before going to the expense of adopting it. Three burners are used under each of the 80-horse power boilers, the oil being forced up to the feeders and kept at a steady flow. It is said that it makes a steadier heat than it is possible to obtain from coal, but it is feared by many, and with good reason, that the life of a boiler using this fuel will be very short; besides, it is rather dangerous as yet.

THE FIRST CORLISS CUT-OFF.—In 1848, on the 17th of February, Geo. H. Corliss started his first engine with variable cut-off valves. The engine was the first of its kind wherein the regulation of speed is effected by the time of closing the induction valves, and was the beginning of a type now made the world over. The engine was of 260 H. P., and constructed throughout with reference to this method of working. The cylinder was twenty-two inches in diameter, and the stroke six feet.

REPAIRING A STEAM PIPE BREAK.—An ingenious means of repairing a break in a steam pipe consists in binding the break with wood strips, laid close together, and well served around with stout cord or rope, endwise separation being prevented by more rope crossing the break diagonally, and tied so as to draw the broken parts together. On the wood and the cord getting wet with steam, the joints become tighter than before, as the wood swells and the cords tighten.

WHEN an exhaust injector fails to work, look to the temperature of the exhaust steam for the cause. An exhaust injector will not work unless the steam has a temperature of 212 degrees. In many cases, the vapor reaches the injector at a temperature considerably less and is unable to do any work. Steam is supposed to become water when its temperature is less than 212 degrees, but put a thermometer in the exhaust pipe near the injector, and note the temperature.

TO DETERMINE THE SAFETY PRESSURE OF A BOILER.—If you ascertain the thickness of a boiler shell in decimals of an inch, and shift the decimal point three places to the right, and then divide the number thus found by the diameter of the boiler in feet, the quotient obtained will be the safe working pressure in pounds for that boiler.—*Safety Valve.*

REMEMBER that the improper management of a boiler when in operation, and the neglect of proper inspection, are the causes that operate most frequently to produce explosions.—*Safety Valve.*

SAWMILL NOTES.

The Working of Circular Saws.

For the benefit of our readers who are desirous to become acquainted technically with the physical laws governing the working of circular saws while they are cutting their way through timber, we make a few quotations from a Western contemporary that has of late been considering this matter:

Take, for example, a large circular saw. As running ordinarily, the precise point around which radiates the metal may be considered the true center of the saw, but, as all must know, the moment a substance comes in contact with the surface this center is removed. If we place an obstruction, as in the place of a log to be sawn in twain, against the outer edge of one of the teeth, this center is removed to a point directly opposite this point of contact. Supposing, for instance, that the saw is precisely 3 feet 6 inches from the true center when in motion without any obstruction to the outer point of the tooth, then the saw would, of course, be 7 feet in diameter, so from the point where it first meets the obstruction to the center would be a leverage of 3 feet 6 inches, and an obstruction requiring a force of 15 pounds to force through would remove the center .036, less .015, in the opposite direction, or, in other words, about one-half an inch from where it originally existed, and as a perfectly round saw—an utter impossibility—will touch at but one point at once as it revolves, it is plain to be seen that the true center is constantly changing position, it being backward, forward, above and below, according to the variety of timber, regularity of feed, etc.

In addition to this change, we have another influence to overcome which also causes another change, and an important one, viz., when the saw meets this obstruction there is not a wheel or pulley in the entire building, from the saw to the drive-wheel, but feels and responds to the change of center. We have first, pulley on the arbor which propels the saw—its center changes with every motion of the saw's center, and so on to the end. Right here is the primary source of the loss or misapplication of power, and if any one can devise means by which these reverse forces may be overcome, we can run our machinery at about 100th the power now required.

But leaving this point for the present, we will return to the saw and note the changes going on there, while these forces in juxtaposition are being equalized sufficient to realize the little we do from the power at hand. The saw, then, being composed of a material susceptible of withstanding immense tension, or else with this unequal leverage spoken of in the foregoing, would tear it asunder. The particles of iron—called technically the molecules—constituting the saw as held together by two recognized forces, the one molecular cohesion is apparent in all metals, the other the mechanical amalgamation of these particles, enables the material composing the best make of saws to withstand these unequal pressures for some time, but after a time, unless sooner worn out and filed away, the results of these will become apparent and are manifested in various ways, such as getting out of true, a constant tendency to move in a wabbling shape, and the like, all or any of which indications culminate in a break. It must be borne in mind that the tension is always in the same direction, namely, from the cutting edge backward, and if by any means it could be arranged that the saw in passing backward could be subjected to the same tension as in passing through the log, it would stand just twice as long as it now does. It really appears that a saw could be made that would do work each way, thus not only getting more wear out of it, but an immense amount of now lost motion would be utilized and a reverse action and influence being brought to bear on all the machinery, these two forces would neutralize each other and the pulleys, wheels, shafting and everything last nearly if not quite twice as long.

Commenting upon the above, the Boston *Journal of Commerce* says: All users of saws are invited to participate in the search for the new center, and if possible confine it within the limits of the saw bench. How one resistance can neutralize another, or the amount of power to drive a saw can be lessened a hundredfold by bringing as much load on the opposite half, is difficult to comprehend. This additional resistance may remove a portion of the strain upon the saw-arbor boxes, but when the truth is known it will be found that every additional resistance will call for a corresponding increase in the power transmitted. This technical principle of the physical laws governing the action of saws must be very inviting to those interested in the art of gearing, as it would only need the power to be applied by gear wheels to be connected with the driving wheel by means of two driven pinions diametrically opposite on each side of the driver. We will leave the subject for the comments of those of our mechanical readers interested in this matter, whom we expect soon to hear from.

A LATE INVENTION for the use of sawmills, called the rosser, or log-siding machine, removes the bark and the outer slab from a log, forming a cant of the required dimension without the use of a circular, and is regarded by those who have used it as a valuable device. The log is passed through a set of revolving wheels with a series of knives which grind off the outer slab upon the log, and it passes thence directly to the gang or circular, to be cut as required. It leaves no slabs, as the entire amount which would, in the old process, form slabs and thin boards, is ground up by these knives. The principal advantage claimed for it is the great saving of time. One is now being put into the Sawyer-Goodman Co.'s mill at Menominee, Mich.—*Saginaw Herald.*

How to Manage a Saw.

The first step in the successful management of a circular-mill saw, says the *Sawmill Gazette*, is to buy a good one fully warranted—one adapted to its work and to the man who runs it. A thin saw requires a greater number of teeth and a more expert man than a thick one. It should be of stiff temper. It is more easily broken, more susceptible to misuse and negligence. Care should be taken that the arbor does not heat, that the track is in line, that the saw fits the arbor easily, and that it is hung true. Hardly any two saws hang alike on an arbor. A slight difference in the finish of a saw about the hole, or in the turning of the collars, makes a perceptible difference on the edge; and this should be remedied by rings of paper. A saw should be jointed carefully on the mandrel on which it runs, which can be done by pushing a piece of emery-wheel squarely across the teeth while the saw is in motion.

Any good mechanic can take a buckle out of a saw by using as an anvil a block of hardwood set in the ground, with the top slightly rounded. Never use a steel or iron anvil, as it changes the tension. If the saw becomes rimbound or snakes, it must go to the sawmaker. A circular-mill saw, to work freely, should be properly gummed, and set enough to clear the saw nicely; the teeth should be from 1½ to 2 inches deep, with a gullet, and the backs of the teeth should be kept low enough to avoid striking the timber and rub. An emery-wheel is the best saw gummer, but great care should be taken not to blue the teeth, and to keep them in uniform space and depth. The pitch of the teeth should be regulated somewhat by the work a saw is doing. From one-fifth to one-sixth of the diameter, measured from the edge, will give the proper circle. A sawyer who does not know his speed can tell whether his saw needs expanding in the center or on the edge by warming it in the different places with a narrow board while running, and watching results. Always avoid sharp corners, and always warm saws up in winter before putting them into the timber.

THE SAW VS. THE AX.—In California the saw has largely supplanted the ax in bringing down redwoods, but the change is severe upon the woodsmen. After being sawed partly through, a tree is forced over by inserting a number of steel wedges in the kerf, which are driven in with steel sledges. They are set in as close together as possible, and the driving of the wedges frequently takes three hours or more. The constant contact of the steel sledges with the steel wedges results in chipping off fragments which fly with great force, and in numerous instances become imbedded in the flesh of the workmen, requiring a surgical operation to remove them. Many eyes have been lost in this way, while arm and shoulder wounds are frequent. Some means of protection against the sharp missile is needed, but a man swinging a hammer cannot be muzzled up to any great extent.—*Northwestern Lumberman.*

A PLANK was recently caught on the pony saw of Hobbs, Wall & Co.'s mill at Crescent City, and thrown through the air a distance of 100 feet. No one was injured.

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The Academy of Sciences Building.

Laying the Corner-Stone.

On Friday of last week the ceremony of laying the corner-stone of the new building of the California Academy of Sciences on Market street, near Fourth, was performed. The officers and trustees were on the platform, surrounded by members and friends. At 1 P. M. the officers of the academy assembled in their office, at room 17, Flood building, and after making a selection of the various articles and papers presented for insertion in the corner-stone, placed the following in the copper box, one cubic foot in dimensions, and sealed it up:

Photograph of James Lick.

Picture of the new Academy of Sciences building.

Deed of trust of James Lick, dated September 21, 1876.

Three copies of Constitution of Academy of Sciences, with names of members, in 1876-'81 and '89.

Directory of San Francisco for 1889.

Copy of Irving M. Scott's address upon the occasion of laying the corner-stone.

Proceedings of the academy in pamphlet form.

Memoirs of the academy, containing pictures of animals, plants, etc.

Copies of the San Francisco papers.

Report of the Lick Trustees.

Photograph of the great Lick telescope.

Formal recognition of the transfer of the Lick Observatory to the State University.

Register of the State University for 1887-88.

Meteorological reports of Oakland, by Dr. J. B. Trembley.

Portrait and biography of Governor Waterman.

The Exercises.

At the appointed time Colonel C. F. Crocker, President of the Board of Trustees, mounted the temporary platform and called the assemblage to order.

Colonel Crocker, in a few well-chosen words, stated the object of the occasion and the pleasure it afforded him to preside at such a momentous event. He then introduced as orator of the day Irving M. Scott.

Irving M. Scott's Address.

Mr. Scott then began his address upon "The Development of Science," which we regret, owing to its length, our inability to publish in full.

Mr. Scott, in opening, expressed the doubt of his ability to deal thoroughly with the subject, because the profound learning and exalted character of the academy might well deter from the undertaking one more gifted by nature and riper in scholarship than himself. The "magnificent" structure whose corner-stone he helped lay to-day would, he said, be a monument—a Pharos—whose beams of light would not only effect the grand object of enlightening and elevating man adown the course of time, but would transmit to the latest posterity the name of James Lick as one of the greatest benefactors to science of his time.

The address reviewed the development of science, showing how, step by step, it had shattered the superstitions of the past, and predicted that it would in time, by further discoveries, destroy the superstitions of the present age. In conclusion Mr. Scott said:

"This new philosophy acquaints us with the methods of nature in effecting her works—brings us, as it were, into intimate companionship with her, so that without distrust she readily discloses those things which hitherto philosophy held to be occult.

"It enables us to measure and accurately determine the value of heat, light, motion and electricity in the known terms of foot-pounds.

"Its discoveries and inventions mark an epoch in the progress of science unsurpassed in importance by that distinguished by the immortal discoveries and inventions of Galileo, Kepler and Newton.

"In this philosophy is reached the highest development of science yet attained—eminently a unity of sciences. Other developments *may*, and not improbably *will*, be made of a still higher order. Indeed, there seems ample reason for anticipating that the Academy of Sciences of San Francisco will still further distinguish itself by its efforts in augmenting the flow of this incomparably grand and beautiful stream."

The President's Address.

The closing address of Dr. Harvey W. Harkness, president of the Academy, was as follows:

"On the 4th of April, 1853, a little band of lovers of science, seven in number, met in a small room in this city for the purpose of taking steps toward the organization of a society for the advancement of the natural sciences.

"These men were: Dr. Andrew Randall, Dr. Henry Gibbons, Dr. Albert Kellogg, T. J. Nevins, Charles Farris, Prof. T. B. Trask, and Lewis W. Sloat, all of whom are now numbered with the dead, the last to leave us being our lamented friend, Dr. Kellogg. Seldom in civil life has there been an instance where results so important have grown out of the action of a body of men, so few in number, and most of them in such humble circumstances, for these men were the founders of the California Academy of Sciences, which, after more than a third of a century of struggles and vicissitudes, comes at last in assured prosperity to lay the corner-stone of its permanent home to-day.

"The early volumes of proceedings serve to show the character of our founders and their fitness for the work they had undertaken. With but few books of reference, few types for comparison, and beset by the cares and trials incident to the unsettled condition of society, they were still able to do much good work in their various lines of scientific research. In botany, Dr. Albert Kellogg, whose love for the plants he studied was the passion of his life, has left an imperishable record as an honest and faithful observer. His merits are too well known to most of you to need recalling. Dr. J. B. Trask, many of whose notes and papers are found in our earlier volumes, was a geologist of marked ability, who, while most of the men of his day were eagerly engaged in the pursuit of wealth, was exploring valley and mountain in the interest of his favorite branch of science. Dr. Henry Gibbons, another of the seven, was a careful observer in many lines of research, and is, perhaps, best known in science in connection with his meteorological records.

"Time will not permit me to do justice to the many who subsequently became their co-workers. Special mention should, however, be made of the late Dr. William O. Ayers, who as an ichthyologist was undoubtedly the peer of any one of that period. His first paper published in our proceedings in September, 1854, together with the many which followed, prove that his was a mind peculiarly adapted to scientific research, and his description of the fishes of this coast will always take rank as models of terseness and technical completeness.

"Of the list of honorary members Drs. Torrey and Gray, especially the latter, were until the close of their lives deeply interested in the welfare of our society and unwearied in their assistance to our local botanist.

"Of the living members who were identified with the academy at an early period, a few are still actively engaged in scientific work. Dr. J. G. Cooper early contributed valuable zoological papers, and now director of our museum, still continues his labors. R. E. C. Stearns, for many years an active and efficient member, is now employed and doing good work in conchology in the Smithsonian Institution in Washington. Of Dr. Hermann Behr, who, contributing papers to the academy in 1854, is still actively engaged in scientific work, too much cannot be said in praise. In his special branch of study (Lepidoptera) he is the recognized authority on this coast, and in botany he is equally eminent. In addition to these branches of science, which would be sufficient to burden the mind of an ordinary man, the thoroughness of his early training and his extensive wide travel and varied studies make him a most valuable aid in other departments of science.

"Our limits will not allow me to make mention of those who within the last 20 years have contributed by their scientific labors to the welfare of the society, and indeed it is hardly necessary, as their work is well known to you all.

"For many years after its organization the society was much embarrassed by lack of funds, being unable even to pay the expenses of collectors, and so could not gather the material needed by specialists in their investigations, which from this cause were to often mistaken or incomplete. This was the more to be regretted as other and wealthier institutions, being able to employ agents, were eagerly collecting in this new field material of great scientific value which should have been retained within the museums of this State.

"A few years ago, however, Charles Crocker gave to the society the sum of $20,000 to be used in the promotion of original research. This timely gift has been in the past, and will continue to be, of incalculable benefit to the academy.

"Another acquisition of great importance was the collection presented by Mr. Crocker and Senator Leland Stanford. This valuable donation will, as soon as we have room to display it, be of great popular benefit, not only as a means of education for the young, but as one of the city's chief attractions.

"The meeting of the society held February 17, 1873, will long be remembered as an eventful one in our history, for on that occasion General John Hewston, as Vice-President, presented to the academy a deed from James Lick conveying the title to the land upon which this building is now being erected. This was the first intimation of his intention to furnish it material aid, although the deed was subsequently withdrawn, that he might substitute another more in accordance with the needs of the society. This generous gift was supplemented by his making the Academy of Sciences one of the residuary legatees of his estate, and from this source alone we shall at no distant day be in possession of not less than $450,000; this being in addition to the land upon which the building is being erected.

"We should be neglecting our duty if we failed upon this occasion to give expression to sentiments of gratitude to our benefactor, who has so munificently assisted us in our efforts to extend the boundaries of human knowledge.

"Truly it may be said of him that in his many benefactions he has built himself a monument more enduring than marble, and so far as it was possible for one in his position to do he has succeeded far beyond the hope of most of his fellow men in his effort to render his name immortal.

"In yonder cemetery there stands a monument, bearing upon its face the name of him who sleeps beneath—that he was born, lived and died—nothing more. His wealth, sent beyond the seas, is in possession of those he never knew, and who will soon forget that he ever lived. Lichens have attached themselves to the stone, and are silently but surely at work to accomplish its destruction, and weeds and tangle hide the neglected grave. Now and again some passer-by will stop, in an idle moment to read the brief story, until eventually the broken column disappears, and his name is lost to the memory of men.

"Here, on the contrary, is a monument to one who is gone, which, while bringing blessings to countless generations yet unborn, will preserve his name among men so long as governments shall exist to protect the property he so generously placed in our keeping."

After the address the corner-stone was laid, Dr. Harkness wielding the silver trowel, which was presented by E. J. Molera, one of the trustees.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

"AN INCH OF RAIN," explains the *Popular Science Monthly*, "means a gallon of water spread over a surface of nearly two square feet, or a fall of about 100 tons on an acre of ground."

THE CALIFORNIA CONSOLIDATED Gold Mining Company, Sierra City, Cal., A. Schubert, President; Alvin Fischer, Secretary; A. Leffer, Superintendent. Divided into 300,000 shares at $1 each. Property comprises two locations. Ore assays $7 per ton, average. Coarse gold, solid rock; vein from 15 inches to 2 feet wide Tunnel No. 1 in 120 feet, and prospects well. No. 2 just begun. Stockholders: Alvin Fischer, A. Schubert, Gus Fischer, F. L. Fischer, Anton Fischer, Fred Fischer. For information concerning stock, etc., apply to F. L. Fischer, Sierra City.

THE BUFFALO CONSOLIDATED GOLD Mining Company, Sierra City, Cal., Ernest Busch, Superintendent. Stock divided into 600,000 shares at $1 per share. The property comprises 5 locations. Ore finely decomposed, carries coarse gold. Size of ledge: Tunnel No 1, 32 ft; No. 2, 9½ ft.; No. 3, 10 ft. Fine black decomposed rock interspersed with white quartz. New 10-stamp mill run by a Pelton Wheel, blacksmith shop and boarding house. Stockholders: Ernest Busch, Hugh Murray, Frank Cook, J. G. Lee, Henry Carpenter. For further information apply to Ernest Busch, Sup't, or Hugh Murray, Sec'y.

Home for Children.

A lady would take care of two or three children over two years of age. A good home and very best of care in every respect. References given and required. MRS T. A. MOODY, 169 Eighth St., Portland, Or.

DELINQUENT SALE NOTICE.

Gray Eagle Mining Company —Location of principal place of business, San Francisco, California. Location of works, Placer county, Cal.

NOTICE.—There are delinquent upon the following described Stock, on account of Assessment (No. 13), levied on the 15th day of May, 1889, the several amounts set opposite the names of the respective Shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amt.
Bogart, O H, Trustee	447	5,000	$250 00
" "	457	100	5 00
Chase, Q A	419	3,814	190 70
Carnes, W A	252	416	20 80
Durning, T G, Trustee	105	100	5 00
Duncan, John	167	300	15 00
" "	247	12	60
Erlenweiss, John	63	200	10 00
" "	60	200	10 00
Francis, H L	444	1,500	75 00
Hall, Wm E	131	900	45 00
" "	154	1,000	50 00
Hall, Wm E, Trustee	411	200	10 00
" "	412	200	10 00
" "	413	100	5 00
Stout, C S, Trustee	422	100	5 30
Waller, L P F, Trustee	367	3,000	150 00
Wetzel, Thos, Trustee	60	250	12 50
" "	169	100	5 00
" "	288	10	50
" "	335	100	5 00
Winter, T P, Trustee	396	500	25 00
" "	397	500	25 00

And in accordance with law, and an order of the Board of Directors, made on the 25th day of June, 1889, so many shares of each parcel of such Stock as may be necessary will be sold at public auction, at the office of the Company, 327 Pine street, room 9, San Francisco, California, on Tuesday, the 23d day of July, 1889, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale. O. H. BOGART, Secretary.
Office, 327 Pine street, room 9, San Francisco, Cal.

DIVIDEND NOTICE.

THE GERMAN SAVINGS & LOAN SOCIETY

526 California Street.

For the half year ending June 30, 1889, a dividend has been declared at the rate of five and one-tenth (5 1-10) per cent per annum on Term Deposits, and four and one-quarter (4¼) per cent per annum on Ordinary Deposits. Payable on and after Monday, July 1, 1889.

GEO. TOURNY, Secretary.

STOCKHOLDERS' MEETING.

A Special Called Meeting of the Stockholders of the CALIFORNIA AND NEVADA RAILROAD COMPANY will be held at the office of the Company, 320 California Street, Room 12 San Francisco, California, on SATURDAY, THE THIRD DAY OF AUGUST, 1889, at the hour of 2 o'clock P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Friday, August 2, 1889, at 12 M. E. A PHELPS, Secretary.
Office, Room 12, No. 320 California Street, San Francisco, California.



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E. P. HEALD, President.
C. S. HALEY, Secretary.

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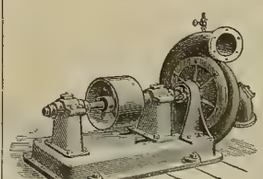
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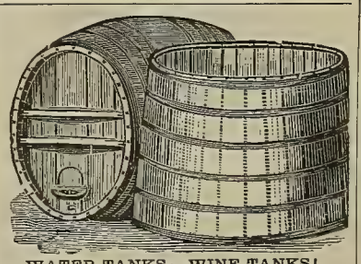
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One new double circular Sawmill to carry 60-inch bottom saw, with wrought-iron hangers for top saw. Friction feed-works, patent steel screw double-throw head-blocks, with track iron, saw carriage and frame complete.
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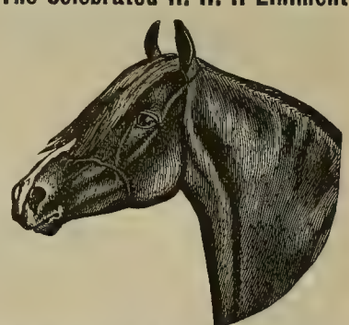
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CHAS. & WM. MONTGOMERY, Prop'rs.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

From the official report of U. S. Patents in DEWEY & Co.'s Patent Office Library, 220 Market St., S. F.

FOR WEEK ENDING JULY 9, 1889.

406,516.—FENCE-MAKING MACHINE — Armstrong, Clark & Cottrell, S. F.

406,614.—HARVESTERS—C. A. Ashley, Stockton, Cal.

406,562.—BRICK MACHINE—W. Burkman, Los Angeles, Cal.

406,725.—SUBMARINE BOAT—J. B. Gerber, S. F.

406 644 — NON-HEAT CONDUCTING FABRIC—H. M. Hanmore, Santa Cruz, Cal.

406,523.—LIFTING JACK—John P. Hays, North Temescal, Cal.

406,524.—PRUNING SHEARS, ETC.—B. Jennings, San Jose, Cal.

406,843.—SAFETY DEVICE FOR ELEVATORS—E. Lainesse, S. F.

406,528.—MAIL POUCH—C. W. Miller, Clifton, A. T.

406,661.—BICYCLE Edwin Mohrig, S. F.

406,547.—TOASTER—C. T. Tarpenning, Los Angeles, Cal.

406,489.—TELEGRAPH KEY — H. A. Waldo, Reno, Nev.

406,801. -RAILWAY GAGE AND TIE GRIP—Washburn & Krengel, Independence, Ogn.

The following brief list by telegraph, for July 18th, will appear more complete on receipt of mail advices:

California Hower H. Allen, Oceanside, rest for buggy top; Edward L. Burgein, Los Angeles, pipe bender; Oliver Cope, assignor of one-third to J. Otis, San Francisco, cable railway brake; Howard P. Garland, San Francisco, making rollers for jute silvering machines; Will C. J. Howard, Mariposa, assignor of one-half to J. W. Farmer, San Francisco, squirrel poisoning machine; James T. Mahew, Vista, fence; Stephen Strange, Los Angeles, mail-bag rack and distributing table; Julius H. Von Schmidt, San Francisco, hydraulic dredging machine; William Wallace, assignor of one-half to himself and R. C. Braun, San Francisco, sewer-gas top and sink; William J. Wright, San Francisco, ruler.

Washington Territory—Arthur M. Leighton, assignor of one-half to J. H. Livermore, Port Townsend, boot or shoe last.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

LIFTING JACK.—J. P. Hays, North Temescal, Temeda county. No. 406,523. Dated July 9, 1889. This patent covers, in a lifting-jack, the combination of a standard, a lift vertically movable thereon, a lever connected with the lift, and a clutch connected with the lever and vertically movable upon the standard, said clutch being connected with the lever and forming, when engaging the standard, the fulcrum for the lever and support for the lift.

FENCE-MAKING MACHINE.—Thos. L. Armstrong and Edward Clark, Oakland, assignors to the Union Fence Manufacturing Co., of S. F. No. 406,516. Dated July 9, 1889. This invention relates to that class of machines which are used for making what is known as "slat fence," consisting of parallel spaced slats united by wires which are twisted between the slats and form loops for confining them. The patent covers certain details of improvement in these machines. A suitable number of turns is imparted to the twister heads, which heads, by reason of their construction, clutch or grip the wires to such an extent as to place them under proper tension, preventing them from unduly slipping through, a tendency which is common to them, and which makes them bow over the slats instead of twisting snugly thereon.

BICYCLE.—Edwin Mohrig, S. F. No. 406,661. Dated July 9, 1889. This improvement in bicycles consists in jointing or connecting the front and rear portions of the frame and the lower end of the seat standard, and in the connection with the front and rear portions of the frame of an elastic spring, whereby an independent vertical movement of the wheels is allowed. This improvement is on the "safety" type of bicycle. Any roughness or obstruction in the road will be surmounted by the front wheel, the elasticity of the coil allowing the front wheel to rise, while the weight of the rider is supported upon the joint about which the motion takes place. When the rear wheel passes over the same or other obstruction, the elasticity of the improved spring will be sufficient to allow this wheel to rise and relieve itself as it passes over the obstruction. The construction is equally applicable to the frames of tricycles.

PRUNING SHEARS AND FRUIT-PICKER.—Byron Jennings, San Jose, assignor to C. W. Breyfogle and F. L. Voorhies. No. 406,524. Dated July 9, 1889. This improved pruning-shears and fruit-picker consists of the usual fulcrumed opposing shear-blades, with the opening spring and handles by which they may be operated, and in combination therewith of an elastic rubber block having the ends only held in clamps, which project over said ends and are formed upon and as a part of the shear-blade itself. An especial advantage of this device is in the use of open clamps near each end of the rubber block, which, while holding it firmly in place against pressure, will allow it to be instantaneously removed and replaced when necessary, and by reason of the space between these clamps the central portion of the rubber block is allowed to spring or arch upwardly whenever a stem or limb of considerable size is to be cut. The freedom of the center portion of the rubber to move is an improved feature of the invention, since it enables it to accommodate itself to limbs of various sizes without being removed and without readjustment.

The Davidson Steam Pump.

We call attention in this issue to the Davidson steam pump, of which the Risdon Iron & Locomotive Works of San Francisco have the exclusive agency for this coast. From their Eastern agents they learn that the Spreckels sugar refinery of Philadelphia is now having built six Davidson pumps, of the plunger pattern, 18-inch steam cylinder, 14-inch water cylinder, 24-inch stroke, four pumps, 12 inch steam cylinder, 10-inch water cylinder, 24-inch stroke, of the piston pattern, and two Meltu pumps 18-inch steam cylinder, 12-inch water cylinder, 24-inch stroke.

For the Brooklyn Water Works, a triple-expansion pumping engine, with steam cylinders, 9-inch, 14-inch and 24-inch, water cylinder 24-inch and stroke 24 inch, steam pressure 100 pounds.

They are also setting up at the water-works station of the Laconia & Lake Village Water Co., Lake Village, N. H., a pair of compound-pumping engines, steam cylinders 14-inch and 26 inch, water cylinders 13-inch, stroke 24-inch; these pumps are constructed so as to work as a pair of duplex pumps, or as two single pumps working independent (the change can be made while pumps are running or at rest); this is a patented feature of the pumps; it saves the wear and tear on one of the pumps when one is able to do the work; or in case of a breakdown on one of the pumps, it does not necessitate the shutting down of the other. Four pumping engines, plunger pattern, are working under this principle at the Brooklyn water works, steam cylinders 26-inch and 48 inch, water cylinder 24-inch, stroke 36-inch; there is also a pair of plunger pumps at Fall River, Mass., same principle, steam cylinders 26-inch and 48-inch by 22-inch water cylinder by 36-inch stroke.

A pair of compound sewerage pumping engines, steam cylinders 10x20x14 inch, water cylinder 24-inch stroke, is now being built to work single or duplex. These pumps are for Framingham, Massachusetts; also a pair of pumps for Milford (Conn.) Water Works, to work single or duplex, size the regular No. 10 pressure pump; also two No. 9 and two No. 10 and two No. 12 regular pressure pumps, to work single or duplex, for elevator duty. Two pumps for the Weideman Silk-Dyeing Company, Paterson, New Jersey, steam cylinder 24x22 inches and water cylinder 24-inch stroke; a duplicate order from the North Attleboro Water Works, North Attleboro, Massachusetts, for pumping engine, steam cylinders 18x34 inches by 15-inch water cylinder by 24-inch stroke, piston pattern; order from the Pennsylvania Steel Company for two pumps, 14-inch steam cylinder by 14-inch water cylinder by 18-inch stroke; Morgan Iron Works, New York City, for a No. 4 and No. 9 pressure pump and six evaporators—four 4000 and two 6000 gallons in 24 hours—for six steamships building by them; a pair of compound boiler feed-pumps, steam cylinders 8x13 inch by 7-inch water cylinder by 12 inch stroke, with air-pump and condenser, for electric-light plant, Brooklyn; two No. 12 distillers for Cramp & Sons, Philadelphia; four pumps for the U. S. S. "Concord and Bennington," steam cylinders 14-inch, circulating cylinder 18-inch, and two air cylinders 18-inch and bilge cylinder 4-inch.

A gold medal was awarded this pump by the Massachusetts Charitable Mechanic Association, one of, if not the oldest, of its kind in this country. Money cannot buy a gold medal from this association, merit alone secures it, and it was won from a large number of exhibitors of steam pumps.

The Brooklyn Water Works have nine of the Davidson pumping engines. The Risdon Iron and Locomotive Works have constantly on hand a full line of all the various sizes of these pumps ordinarily used.

ACADEMY OF SCIENCES.—At the meeting of the Academy of Sciences on Monday evening last, T. S. Brandigee described a number of plants observed by him during a visit to Lower California. P. S. Buckminster presented a large collection of plants, collected in the foothills of Fresno county. The trowel with which the corner-stone of the new Academy of Sciences was laid was received and exhibited. L. Belding presented 11 specimens of small thrushes, two types of which were the Big Tree thrush. Chas. Frebig of Eureka presented a loon captured in Humboldt bay. W. W. Price added two Rocky Mountain chipmunks, an Oregon mole, one common chipmunk, and one striped squirrel. A sandpiper and two European finches were received from F. O. Johnson. A specimen of Amblystoma, a species of salamander, was given by Dr. Behr, and 140 specimens of insects were received from Carlos Troyer.

Change in the Parke & Lacy Company.

Lyman C. Parke of the Parke & Lacy Company, having decided to retire from active business, has sold his entire interest in the corporations controlled by Parke & Lacy. These include the Utah & Montana Machinery Co., in Salt Lake, Utah, and Butte, Montana; the Parke & Lacy Machinery Co., Portland, Or., and Parke & Lacy Co. of this city and Sydney, New South Wales. Mr. Parke's interests have been purchased by his partner, B. T. Lacy, who will continue the business as heretofore.

We congratulate Mr. Parke on being able to retire and enjoy the fruits of his labors. The firm started on a very small scale and with no large amount of capital. They secured a number of valuable agencies and very soon succeeded in building up a large business in San Francisco. Finding then that the mining field was widening to the northwest, the other branches were established, and these have been uniformly successful also. The Sydney, N. S. W., house has been the means of introducing American machinery in that colony, particularly that relating to mining and wood-working.

The firm of Parke & Lacy introduced to the mining regions of this coast many of the best-known machines for saving labor. It has also accomplished a great deal toward the saving of precious metals with machines for pulverizing, concentrating and amalgamating. At this time the firm is meeting with good success in introducing the same class of machinery in the Australian colonies and the U. S. of Colombia. They have here a fine large building specially designed for their business. Mr. Lacy, on whom the entire management of affairs will now devolve, is a practical man with an intimate knowledge of mining and mining machinery, thoroughly posted on the needs of the coast. He has spent much of his time in the mining regions among the mills and reduction works, but will hereafter devote himself more to the general management than to carrying out details, having a good corps of skilled and practical assistants for that branch of business.

Como, Nevada.

EDITORS PRESS:—The Eureka Como has stopped pumping and are working only above water level, where they are taking out some good ore. The Rapidan is finding some very rich ore, and have just had a 50-ton lot of fair-grade ore milled. There has been a new find made on the Buckeye recently, assays from which go $300 to $1000 per ton, mostly silver. Nearly all the ore in this camp is silver ore, and the heavy discount is a great drawback. There is high-grade ore being found in more different places in the district than ever before, yet the camp languishes for the want of capital to develop it. There is certainly rich ore in paying quantities here, and some day some company with the necessary courage and capital will have the good fortune to uncover it.

The water in the Carson river is so low that all the mills depending upon it have had to close down about a month earlier than last year. S.

ALASKA MINING PATENTS.—Up to 1888 only four patents in all Alaska had been applied for, and those embraced the claims comprising the famous Treadwell group, the patents for which were issued by the Government early last year. During 1888 97 applications for patents for mineral ground and seven for mill-sites were made on the Douglas island mineral belt and the Basin mineral belt. It is safe to estimate that at least $2,000,000 have been expended on the Douglas island mineral belt since its discovery in the way of improvements and development work.

THE eight copper companies controlled and having their headquarters in Boston, including the Calumet and Hecla, paid $1,650 000 in dividends for the first six months of 1889, against $1,060,000 in the corresponding period last year.

MILK GLOBULES.—Some one who has never counted them avers that the average globules in a quart of milk is about 2,000,000,000,000.

The Ruby Mines of India.

These mines are located about 50 miles north of Mandalay, the capital of Burmah, and are the only source of first-class rubies in the world. These gems are found in the layers of gravel and earth and also in the clefts of the magnesian limestone, which is the matrix of the ruby.

The late King of Burmah formerly got a yearly revenue of 50,000 Rx. from them, but in consequence of wasteful working and extravagant management, the returns have been greatly diminished the past few years.

These mines have recently been incorporated in London under the name of the Burmah Ruby Mines Co., Limited, in which the Rothschilds are said to hold a controlling interest. The new company propose to put in the most improved mechanical appliances and work them in a much more extensive and systematic way.

The specific gravity of the stones is about four times that of quartz, so that it is not difficult to save them by washing, and the California system of sluicing is now to be adopted. Another California invention has also found place in the new system of working—the Pelton water wheel, four of them having recently been ordered for running pumps, hoists, electric lights, etc.

This shipment goes West via China and Calcutta, and is expected to reach its destination in about 60 days. Should a California traveler chance to visit these mines, he would be greeted with the familiar hum of the Pelton wheels, strongly reminding him of home, as also of the fact that the fame of California's most illustrious invention has gone around the world.

SHASTA COUNTY MINES.—A dispatch from Redding says: The biggest sale of mining property in the history of Northern California is now being negotiated between William T. Coleman and an English syndicate. Abstracts of title to a group of 60 mines, 20 of which are patented, are under way. It is reported that the purchase price is in round numbers $2,000,000. These properties have been in the name and under the control of a corporation known as the Niagara Mining and Milling Company. The Niagara, the leading mine of the group, is generally regarded as a good piece of property, and has been worked for several years. It is stated that the new owners will work the Niagara and other mines on a large scale.

PROSPECTING THE DESERT.—An expedition to explore and prospect the country along the new Utah railroad from Frisco in Utah to the Needles on the Colorado, will soon take the field. Mr. W. F. Leon of the Nevada and California Mining and Trading Co. left on Saturday to take charge of the work. The center of operations of the party will be at the Needles, and abundant supplies have been laid in at that point. New stations will be established at various points from which food and water supplies can be drawn, and the country will thus be thoroughly prospected.

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Osceola, Nevada.

Smith & Drew took out Tuesday, in their dry wash diggings, in addition to 5 ozs. of fine gold, a nugget weighing 22 ozs. The machine used was Freeman's Dry Process Separator.—*Utah Daily Union, May 10, 1889.*

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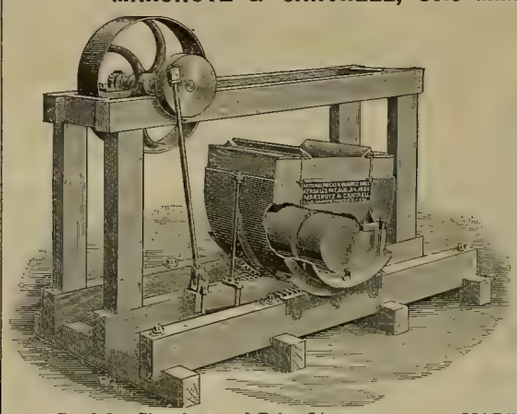
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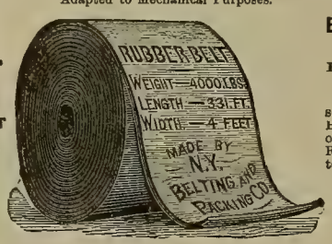
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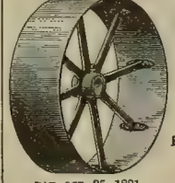
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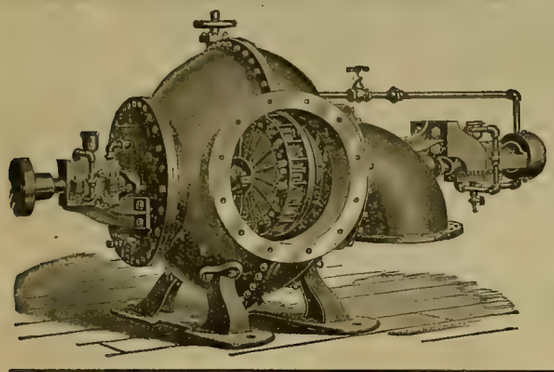
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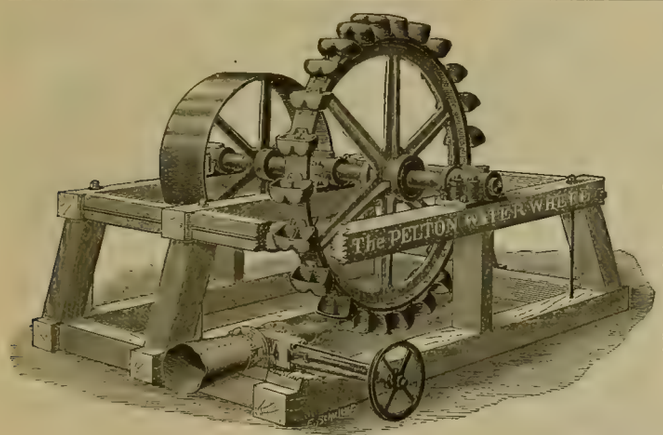
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Ores worked by any Process.
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Analyses of Ores, Minerals, Waters, etc.
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JOHN W. QUICK, Proprietor.

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, July 18, 1889.

Trade the past week was quiet in all branches, except hardware. The latter has been quite active for the past four months, which goes far in confirming reports of a steady increase in the improvements going on on this coast. Interior merchants continue backward in ordering goods: the buying appears to be confined to assortment orders. It is claimed that when stocking up does set in a large trade will be had in all branches of business.

In the local market, money continues easy. While there are many who complain, yet a quiet but thorough canvass of the situation convinces us that today there is more available coin in this city than for several years past in the month of July. So far as ascertainable, all legitimate trade wants are met by banks, but for other purposes there is some friction in getting funds unless upon the best of security. The commercial banks in this city show a fine record for the past fiscal year. The profit and loss accounts of each and all are on the right side of the ledger. The condition of the San Francisco savings banks on the first day of July is shown by the following figures, compared with the statement of the same time a year ago:

Resources.	1888.	1889.
Bank premises	$478,106	$740,606
Real estate by foreclosure	1,004,778	965,535
Invested in stocks & bonds	17,247,091	15 306,340
Loans on real es ate	44 128,588	53 343,703
Loans on stocks and bonds	6,438,848	6,437,546
Loans on other securities	10,000	16,000
Money on hand	1,624,977	2,106,167
Money in other banks	555,251	828,529
Other assets	194,664	156,457
Total assets	$71,580,307	$79,960,884
Liabilities.		
Capital paid up	$2,326,230	$2,863,333
Reserve fund	2,637,241	2 651,976
Due depositors	66,279 449	73,959,124
Other liabilities	337,387	486,451
Total liabilities	$71,580,307	$79,960,884

The above shows a gratifying increase in the deposits, loans effected and money on hand.

Sterling exchanges are weaker, in sympathy with the East, where bills are beginning to be offered more freely. It is claimed that the exports from this country in cereals, cotton, meats, etc., will, from now on, be quite heavy. English and other Europeans are in the market at the East picking up American securities, owing to their offering safer investments in case of war abroad.

In the speculative markets it is reported that a deal is on in, or will soon be in powder stocks. Other local securities rule so high that they do not offer much inducements to operators. In cereals there is more doing in futures. Mining stocks have been more active, but as yet the outside moneyed public appears to be afraid of them.

MEXICAN DOLLARS—The market in sympathy with silver and lower sterling exchange is lower. Buying for shipment to China is reported from first hands at 74½ cents for new.

SILVER—The decline in sterling exchange is against the market, that is, the difference between us and the New York market is not so much. Sales in our market the past week ranged from 92¾ to 92½ cents according to the necessity of buyers. Advices from the mines are without essential change. Receipts in this city are only fair. The last Government reports at hand report there was on hand in siver coin and bullion $283,655,933, against which there was outstanding in certificates $258,166,348. This shows that the silver certificates are going into circulation quite freely.

QUICKSILVER—Receipts the past week aggregate 291 flasks, and exports by sea, 100 flasks in transit for Mexico. The demand is fair for the season. In sympathy with the foreign markets, ours shows considerable strength at quotations.

LIME—Receipts the past week aggregate 4350 barrels. The exports by sea were light, aggregating only 100 pounds to Honolulu. The market is steady, with a good demand ruling.

BORAX—Receipts the past week aggregate 1300 ctls. The market is without essential change. The output appears to be regulated by trade requirements.

TIN—The market is barely steady, with buyers only tempted by concessions. The continued shading off of the English market is against buyers for shipments. London advices report tinplate on July 10th at 13s; pig 3 months futures, £89, against £89 12s 6d on July 5th, and £82 on July 11th, 1888.

COPPER—The market is still unsettled, pending better arrangements between the leading companies at the East. The consumption is reported to be quite large, although the demand is said to be slower, owing to the fears that lower prices will obtain. London advices July 10th quote as follows: Chili and G. M. B. spot £41, futures £40, against on July 5th, spot £41 12s 6d, futures, £41 15s.

LEAD—The market has ruled weak at unchanged quotations. Now that the Treasury has made a new ruling regarding Mexican ore, it is thought that a more stable market will soon set in.

IRON—Imports the past week aggregate 805 tons of foreign pig. It is claimed that our market is shaping itself more in favor of holders. The stock in first hands is quite light as is the quantity on passage. Consumers are also lightly stocked. It is generally claimed that when buyers are forced into the market for more liberal supplies, prices for spot will be marked up. The following is a comparison of London quotations:

	July 12, '89.	July 13, '88.
Eglington	44s	37s 6d
Glengarnock	52s	42s 9d

COKE—Imports the past week aggregated 1643 tons. As this was all sold to arrive and goes into immediate consumption, it has no effect on prices, which hold strong at quotations.

COAL—Imports the past week aggregate as follows: Coos bay, 1980 tons; Nanaimo, 634; Australian, 8946; Tacoma, 4000; Seattle, 1500; Departure bay, 4700. Total, 21,230 tons. The local demand shows more activity, owing to dealers having more confidence in the stability of prices well up to the end of the year. Many families and other small consumers are laying in their winter supplies. Large consumers are still offish, under the impression that there will not be any material advance in prices, while there is a strong probability they will recede after the turn of the year under free arrivals of vessels for wheat loading. We are unable to hear of any sales for shipment; the asking price is still $7 for Australian.

Eastern Metal Markets.

By Telegraph.

NEW YORK, July 18, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	42 3-16	92¼	$11 85	$3 87½	$19 26
Friday	42 3-16	92½	11 85	3 90	19 70
Saturday	42½	92	12 00	3 90	19 75
Monday	42½	92	11 90	3 95	19 80
Tuesday	42 1 16	91¾	11 90	3 87½	19 80
Wednesday	42 1-16	9.¾	.....	.....	.....

NEW YORK, July 15.—Borax is firm, on moderate supply. Refined, 9¾@9¾c; powdered, 8¾@9c; concentrated, 7¾@8½c. Quicksilver, 65@66c, supported by an active London market. There have been liberal arrivals of copper, mainly Calumet and Peta. There is no quotable change in spot. Considerable was taken for export at equal to 11@11¾c, free on board. Consumers pay 12@12¾c, car lots to small quantities. At Baltimore pig lead is quiet at $3.90@3.95. Consumers seem well supplied, and the deferred decision about Mexican ore checks speculative interest.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, July 18, 1889.

ANTIMONY	15 @	16
BORAX—Refined	7¼@	7¾
Powdered	7¼@	7¾
Concentrated	— @	6¾
COPPER—		
Bolt	21 @	22
Sheathing	22 @	24
Ingot, jobbing	15 @	16
do, wholesale	12 @	13
Fire Box Sheets	22 @	24
LEAD—Pig	4½@	4¾
Bar	5 @	—
Sheet	7 @	—
Pipe	6 @	—
Shot, discount 10% on 500 bags. Drop, ℔ bag	1 45 @	—
Buck, ℔ bag	1 65 @	—
Chilled, do	1 85 @	—
STEEL—English, ℔	16 @	20
Canton tool	9¼@	—
Black Diamond tool	10 @	16
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4½@	—
TINPLATE—B. V., steel grade, 14x20, P. S.	4 60 @	4 65
B. V., steel grade, 14x20, spot	4 80 @	4 90
Charcoal, 14x20	6 25 @	6 75
do roofing, 14x20	5 12½@	5 25
Pig tin, spot, ℔ lb	21 @	21½
do, do, prompt shipment	— @	—
QUICKSILVER—By the flask	47 50 @	—
Flasks, new	@	—
Flasks, old	35 @	—
COKE—Eng., ton, spot, in blk & sks, resptvly	20 00 @	—
Do, do, to load	13 00 @	13 25

IRON—Glengarnock ton	Spot. 27 00 @	To Load. 27½@
Eglinton, ton	26 00 @	26½@
American Soft, No. 1, ton	@31 00	31½@
Oregon Pig, ton	@30 00	@
Clay Lane White	@24 50	25 @
Shotts, No. 1	28 50 @29 00	@
Bar Iron (base price) ℔ lb	2½@ 3	@
Chrome iron ore, ℔ ton	@10 00	@

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$19 00	$16 00
41 to 60 ft	20 00	17 00
61 to 80 ft	22 00	19 00
61 to 70 ft	26 00	22 00
1x3, fencing	21 00	18 00
1x4, "	20 00	17 00
1x3, 1x4 and 1x6, odd lengths	18 00	15 00
Second quality	16 00	14 00
Selected	23 00	21 00
Clear, except for flooring	30 00	27 00
Clear for flooring	1 00	.....
Clear V. G. No. 1 flooring	5 00	.....
Firewood	13 00	9 00
Dressed Pine, flooring, No. 1, 1x6	31 00	28 00
No. 1, 1x4	33 00	29 00
No. 1, 1¼x4, 1¼x6, and odd sizes	36 00	32 00
All sizes, No. 2	26 00	23 00
Stepping, No. 1	43 00	34 00
Stepping, No. 2	33 00	24 00
Ship timber and plank, rough	26 00	17 00
Selected, planed 1 side, average 40 ft	28 00	23 00
" " 2 " " "	30 00	25 00
" " 3 " " "	32 00	27 00
" " 4 " " "	34 00	29 00
Deck plank, rough, average 35 ft	34 00	31 00
Dressed, average 35 feet	39 00	34 50
Pickets, rough, B. M	19 00	15 00
½x1½, 4 ft long, ℔ M	5 50	4 00

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	$6 75 @ 7 00	Cardiff	9 50@10 00
Liverpool St'm	7 25 @ 7 50	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	8 00 @ 8 50	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Gilman	6 00
Scotch Splint	9 00	Seattle	6 00
West Hartley	10 00	Coos Bay	5 00
Greta	8 00	Cannel	10 00
Westminster Brymbo	9 00	Egg, hard	17 50
Nanaimo	9 00	Cumberland, in sacks	19 00
Sydney	$ 8 00	do, bulk	18 00

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Justice, July 16, $4940; Con. California and Virginia, 13, $89 122; Hanauer, 10, $3700; 11, $2775; 12, $2900; Commonwealth, 13, $15,000; Hanauer, 13, $5800; Hale and Norcross (for June), $73,881.

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Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alpha Con M Co	Nevada	3	25	July 15	Aug 22	Sept 12	C E Elliott	309 Montgomery St
Andes M Co	Nevada	35	25	June 12	July 18	Aug 8	J Hawkins	309 Montgomery St
Baltimore M Co	Nevada	5	25	July 2	Aug 5	Aug 24	A R Grim	401 Montgomery St
Baker Divide M Co	California	17	25	July 8	Aug 10	Aug 28	D M Kent	330 Pine St
Best & Belcher M Co	Nevada	43	25	June 6	July 11	Aug 1	L Osborn	309 Montgomery St
Challar M Co	Nevada	27	50	July 15	Aug 20	Sept 10	O E Elliott	309 Montgomery St
Crocker M Co	Arizona	7	10	Jun 14	July 19	Aug 13	A Waterman	309 Montgomery St
Crown Point M Co	Nevada	51	50	July 9	Aug 12	Sept 2	J Newlands	329 Pine St
Eureka Con M Co	Nevada	12	50	Jun 12	July 15	Aug 7	H P Bush	306 Pine St
Frue Con M Co	California	6	1½	June 11	July 18	Aug 10	J C Bates	434 California St
Gray Eagle M Co	California	13	05	May 15	July 2	July 23	O H Bogart	327 Pine St
Gold Point Con M Co	California	17	1½	June 22	July 27	Aug 17	A P Brady	Grass Valley
Golden Fleece G'd'l M Co	California	14	17	00	May 21	July 20	Sept 16	W. J. Gleason	806 Market St
Inyo Marble Co	California	6	5	May 14	June 24	July 24	G W Luce	205 Front St
Mexican M Co	Nevada	38	25	July 9	Aug 13	Sept 3	O E Elliott	309 Montgomery St
North Belle Isle M Co	Nevada	15	30	June 17	Aug 1	Aug 22	J W Pew	310 Pine St
Nevada Queen M Co	Nevada	5	50	June 3	July 9	July 30	H Deas	309 Montgomery St
Original Gold Hill M Co	Nevada	12	25	June 17	July 23	Aug 14	A W Barrows	303 California St
Platt & Gilson G M Co	California	1	3 00	June 20	July 22	Aug 7	C Herrman	326 Kearny St
Quartz Mountain M Co	California	21	40	Jun 17	July 22	Aug 15	E Hestres	217 Sansome St
Seg Belcher & Mides Con M Co	Nev	3	25	June 4	July 8	July 29	E B Holmes	309 Montgomery St
Sierra Nevada M Co	Nevada	95	25	June 7	July 11	July 31	E L Parker	309 Montgomery St
Utah Con M Co	Nevada	7	25	July 9	Aug 13	Aug 30	A H Fish	309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY	LOCATION.	SECRETARY.	OFFICE IN S. F	MEETING	DATE
Live Oak Drift Gravel M Co	California	J Morizio	328 Montgomery St	Annual	Aug 20
Lady Washington Con M Co	Nevada	L Osborn	309 Montgomery	Annual	July 31
Mountain Tunnel Gravel Co	California	E C Landis	219 Sansome	Annual	July 25

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Benton Con M Co	California	V B Allen	330 Pine St	Annual	July 31
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	July 10
Caledonia M C	Nevada	A S Cheminant	328 Montgomery St	08	July 5
North Star M Co	California	D A Jennings	401 California St	50	Dec 31
Navajo M Co	California	J W Pew	310 Pine St	10	Apr 1
Idaho M Co	California	Grass Valley	7.50		Mar 5
Pacific Borax, Salt & Soda Co	California	A H Clough	230 Montgomery St	1.00	Mar 11

Mining Share Market.

The bears and bulls have had a slightly livelier time in the pit of the two exchanges. The movements in the Comstocks have been sharper, with Ophir and Best and Belcher the leaders. What the activity was grounded on is, as yet, a mystery, outside of the reported improvement made in last week's MINING AND SCIENTIFIC PRESS. To an outsider it looks like purely unadulterated manipulation; but whether to sell stocks or get in stocks remains to be seen. It also looks as if the activity is made so as to send prices to a still lower level before much of an upward move is made. The bears continue in strong force, and unhesitatingly affirm that there is nothing in the mines to warrant higher prices. They also point to the fact that if there was, Col. Mackay would not have gone East. The bulls, whose numbers appear to be growing beautifully less, affirm that Col. Mackay's going East was evidently done to depress the market so as to buy in more stock. They also believe that the situation in the Gold Hill and Middle mines is becoming more interesting each day, and that quite a decided improvement in one or more of the mines is liable to occur any day. The Alta group of mines are attracting more attention, but so far as we can learn, outside dealers, while watching them more closely, touch the stocks, as yet, rather gingerly. Occidental stock has held steady the past week, with only fair trading reported. In outside stocks the Quijotoas have remained lifeless. The Tuscaroras have made spasmodic efforts at a recovery, but the general public appear to be afraid of them. The Bodies made another of their cat-like moves—jumped up about 30 per cent, only to drop down again like a lump of lead. What the move was made on, or for what purpose, no one appears to know. Eureka Consolidated sold at $1, with $1.25 bid, assessment paid.

From the Comstock mines there is nothing new to report. The official letter received to-day (Thursday) from Crown Point is more encouraging. From the other mines private advices are very hopeful of better results soon in some of the more promising. Prospecting and other work in all the mines is being vigorously pushed, as if it is the determination of the managements to find good paying ore if it is to be found. Col. Mackay, before leaving for the East, succeeded in getting a dollar a ton reduction in the milling of ore by the Morgan and also by the California Pan mills. The price is now $6 a ton instead of $7. The Nevada mill will also reduce their milling charges to $6. The other mills, it is said, will fall into line and make a dollar a ton reduction for milling ore. It is said that a movement is on foot to reduce water and transportation charges. The high charges is what the Mining Stock Association of this city has been consistently fighting ever since its organization. From the Tuscarora district the old, old story of rich ore, etc., continues to come to hand. From the Bodies we are unable to obtain any reliable information, and until we do, it is a waste of time to give street rumors, evidently put out for stock manipulation purposes. From the Quijotoas there is nothing of an important character received outside of the official reports. The market opened this morning weak and dull for the Comstocks. The only strength shown was by the Bodies, but few have faith in their stability.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

STATE BUSINESS MEN'S ASSOCIATION, July 16. Object, protecting business men in extending credit, and to establish bureaus of information. Directors—Albert Debicke, James M. Troutt, W. R. Matthews, H. N. Adams and E. L. Henry.

TAMALPAIS LAND & WATER CO., July 17. Capital stock, $40,000. Directors—Joseph G. Eastland, Lovell White, Thomas Magee, Louis L. James and Henry C. Campbell.

THEOSOPHICAL SOCIETY AND UNIVERSAL BROTHERHOOD, July 17. Object, to promote the study of Aryan and other Eastern literature, religions and sciences, etc. Directors—Allen Griffithe, Jerome A. Anderson, Charles H. Sykes, Theodore G. Ed. Walleb, Edward B. Rambo, Sarah A. Harris, Elizabeth Price, Marie A. Walsh, J. Emmett Smith.

SUTTER COUNTY has brought its first direct case against a hydraulic mining company—the Plumas Consolidated of Plumas county—to show cause why the company should not be punished for contempt for violating an injunction.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING June 25.		WEEK ENDING July 2.		WEEK ENDING July 10.		WEEK ENDING July 17.	
Alpha	1.10	1.25	1.15	1.25	1.00	1.20	.90	1.10
Alta	1.30	1.60	1.40	1.45	1.20	1.30	1.20	1.35
Andes	.35	.50	.45	.55	.40	.45	.35	.65
Argenta	....	....	....	....	....	....	....	....
Belcher	2.75	3.40	2 80	3.40	2.65	3.15	2.60	3.00
Best & Belcher	2.50	3.20	2.90	3.60	2.85	3.40	3.10	3.90
Bullion	.60	.70	.65	.70	.60	.65	.65	.65
Baltimore	....	....	....	....	....	....	....	....
Belle Isle	....	.20	....	.20	....	.25	.25	.25
Bodie Con	1.25	1.40	1.30	1.35	1.10	1.20	1.05	1.35
Benton	4.00	4.50	....	....	4.00	....	4.00	....
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	....	.30	.30	.30	....	.35	.30	.35
Commonwealth	4.00	4 30	4.05	4.20	3.90	4.10	4 10	4.30
Con. Va. & Cal	65	75	72	73	71	73	65	74
Challenge	1.80	2.35	1.85	2 30	1.75	....	1.90	2.00
Chollar	1.50	1.75	1 60	1.80	1.45	1.60	1.40	1.60
Confidence	5½	6	....	6.00	5½	5½	5½	5½
Con. Imperial	.35	.45	.40	.45	.40	.45	.40	....
Caledonia	.20	....	....	....	.20	....	.20	.25
Con. Pacific	....	....	....	....	....	....	....	....
Crown Point	2 25	2.75	2 40	2.75	2.00	2.55	2.10	2.30
Crocker	.20	.30	.25	.30	.25	.30	.25	.40
Central	....	....	....	....	....	....	....	....
Dudley	....	....	....	....	....	....	....	....
East B. & B	....	....	....	....	....	....	....	....
Eureka Con	....	....	....	....	....	1.00	....	....
Exchequer	.50	.70	.60	.70	.60	.65	.60	.65
Grand Prize	.70	.75	.65	.75	....	.70	.85	.95
Gould & Curry	1.75	2.30	2 05	2.40	1.80	2.10	1.85	2.20
Hale & Norcross	3.00	3.45	3.30	3.45	2.90	3.10	2.85	3.15
Holmes	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Iowa	....	....	....	....	....	....	....	....
Julia	.20	....	.25	.30	.25	.30	.30	....
Justice	1.10	1.45	....	1.40	1.15	1.35	1.35	1.75
Kentuck	1.05	1.30	1.15	1.20	1.00	1.25	1.00	1.00
Lady Wash	.35	.40	....	.40	....	....	.35	.35
Locomotive	....	....	....	....	....	....	....	....
Martin White	....	....	....	....	....	....	....	....
Mono	1.00	1.05	1.00	1.10	.75	....	.80	1.05
Mexican	2.70	3.25	3.00	3.90	2.75	3 40	2.75	3.10
Mt. Diablo	....	....	....	....	....	....	....	....
Navajo	....	....	....	....	....	....	....	....
North Belle Isle	.95	1.10	.80	.95	1.05	1.25	1.05	1.50
Niagara	....	....	....	....	....	....	....	....
Nev. Queen	.55	1.10	.80	.95	1.30	1.45	1.60	1.80
North G. & C	....	....	....	....	....	....	....	....
Occidental	1.35	1.50	1.40	1.60	1.50	1.70	1.70	2.40
Ophir	4.05	4.75	4.35	5	4.30	5	4.35	5.00
Overman	1.00	1.15	1 10	1.15	1.00	1.05	.90	1.00
Potosi	1.45	1.70	1.50	1.70	1.45	1.65	1.45	1.60
Peerless	.25	.45	.35	.40	.40	....	.35	....
Per	.15	.25	.20	.25	....	....	.15	....
P. Sheridan	....	....	....	....	....	....	....	....
Silver Star	....	....	....	....	....	....	....	....
Savage	1.80	2.15	1.90	2.15	1.65	1.85	1.60	1.85
S. B. & M	1.50	1.95	1.70	1.90	1.35	2.15	1.70	1.90
Sierra Nevada	1.75	2.25	2.95	2.25	2.15	2.55	2.15	2.45
Silver Hill	.40	.45	.40	.45	.40	....	.45	.55
Silver King	....	....	....	....	....	....	....	.85
Scorpion	.15	.20	.20	.25	.20	....	.20	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	....	....	....	....
Union Con	2.75	3.15	2 90	3.55	2.80	3.25	2.80	3.15
Utah	.80	1.00	.90	1.05	.70	.90	.70	.75
Yellow Jacket	2.70	3.15	2.85	3.25	2.75	3.00	2.80	2.90

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TUESDAY, July 3, 9:30 A. M.

50	Hale & Nor	50	3.00
100	Iowa	20	c
125	B. & Belcher	350	Justice 1.70
550	Bodie	1 25	100 Nev. Queen 1.50
100	Bullion	60	c 200 New York 1.05
200	Chollar	1.50	10 N. Belle Is 1.15
100	Commonwealth	4.00	50 Occident 2.30
20	Confidence	5½	50 Ophir 4.85
200	Crown Point	2.15	100 Savage 1.80
500	Con. Imperial	40c	50 Sierra Nevada 2.35
100	Con. Va & Cal	7.25	800 Silver Hill 50c
100	Exchequer	70c	250 W Comstock 40c
100	Gould & Curry	2.05	

MANY local earthquakes are occurring south of Mono lake.

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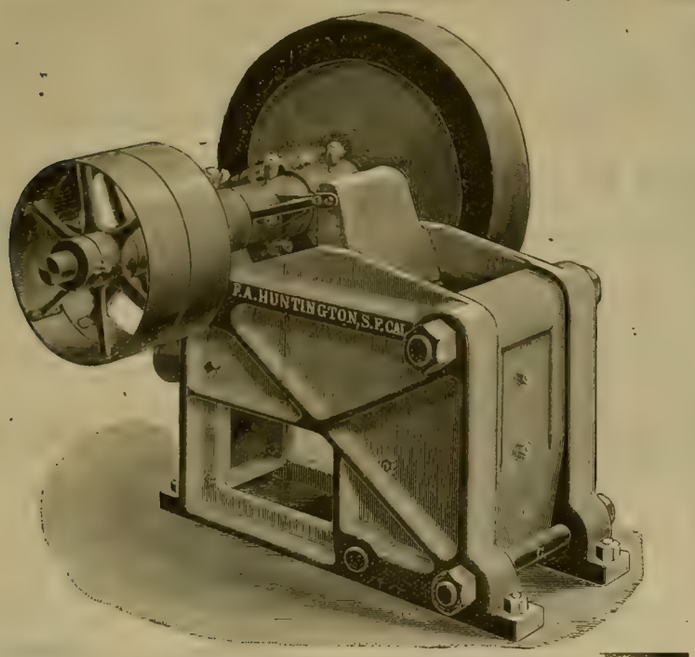
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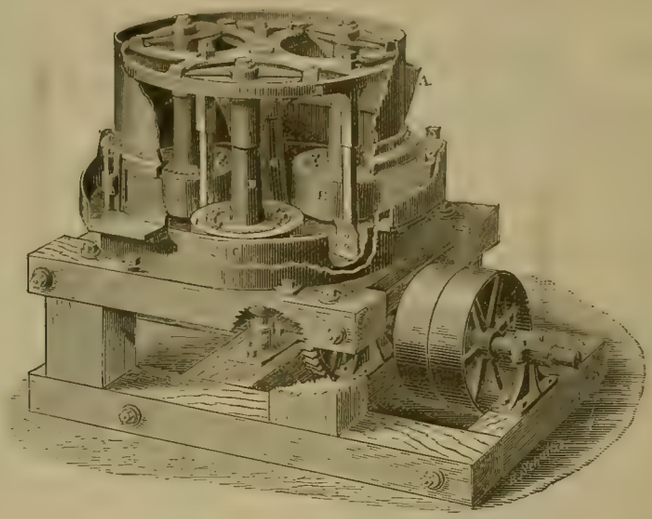
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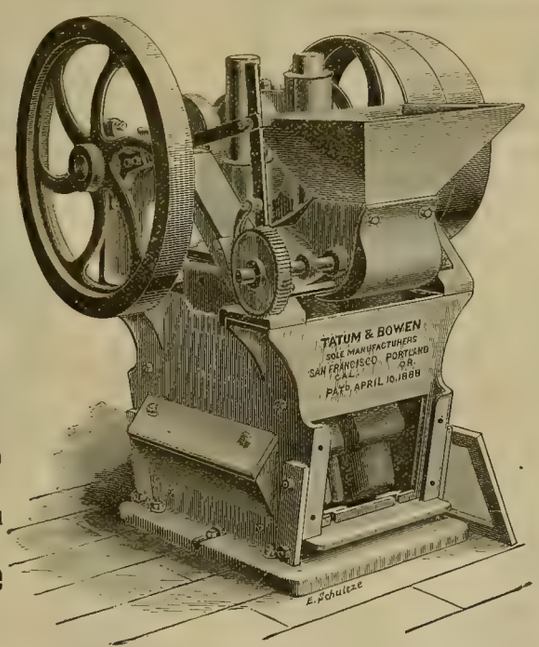
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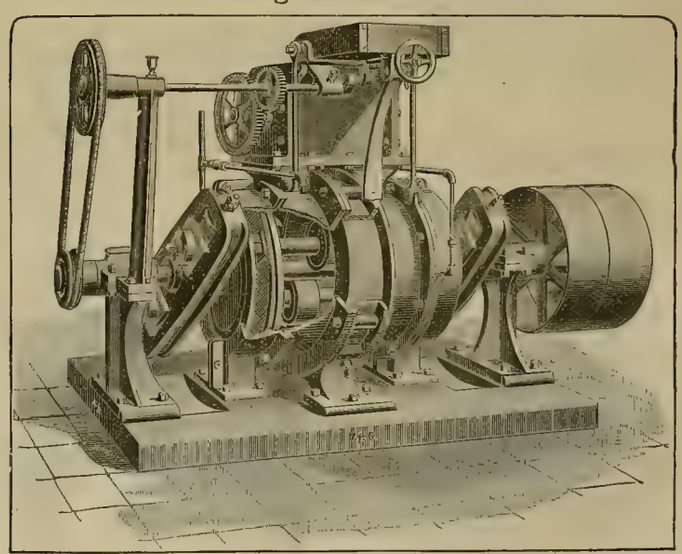
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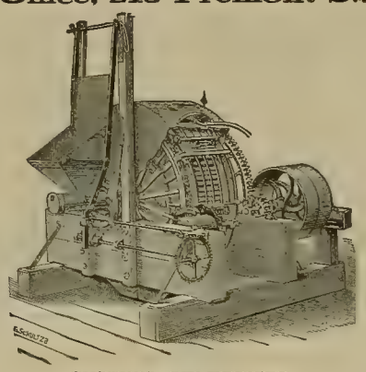
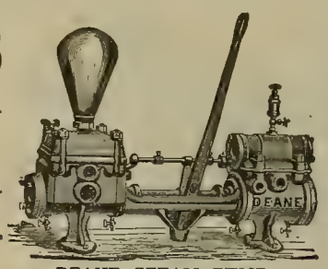
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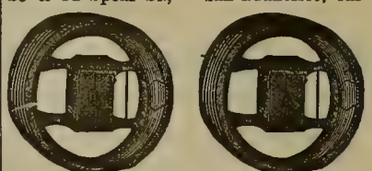

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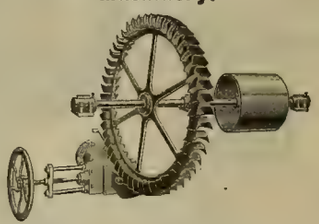
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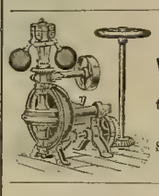
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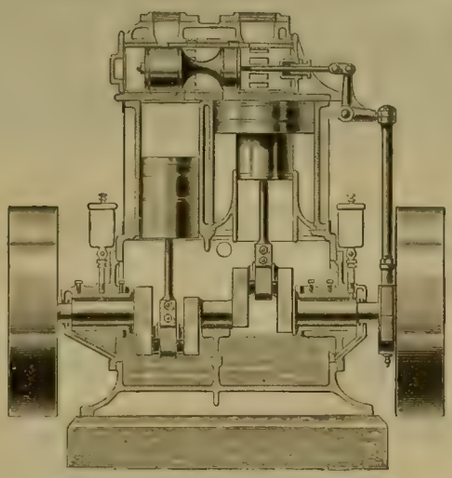
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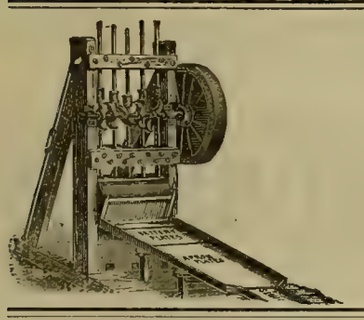
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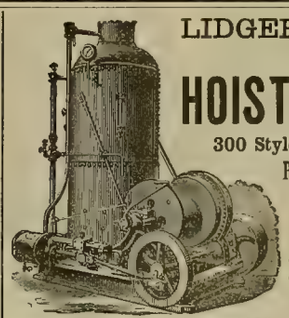
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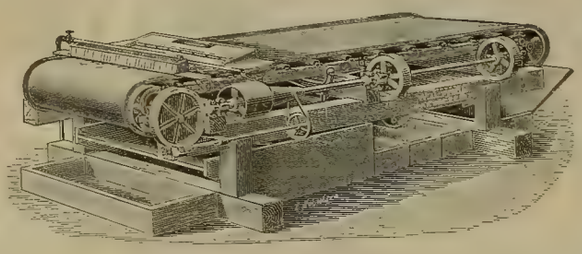
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N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

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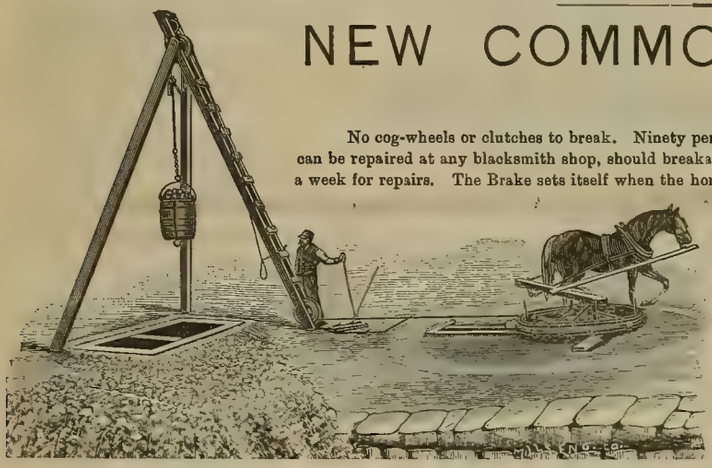
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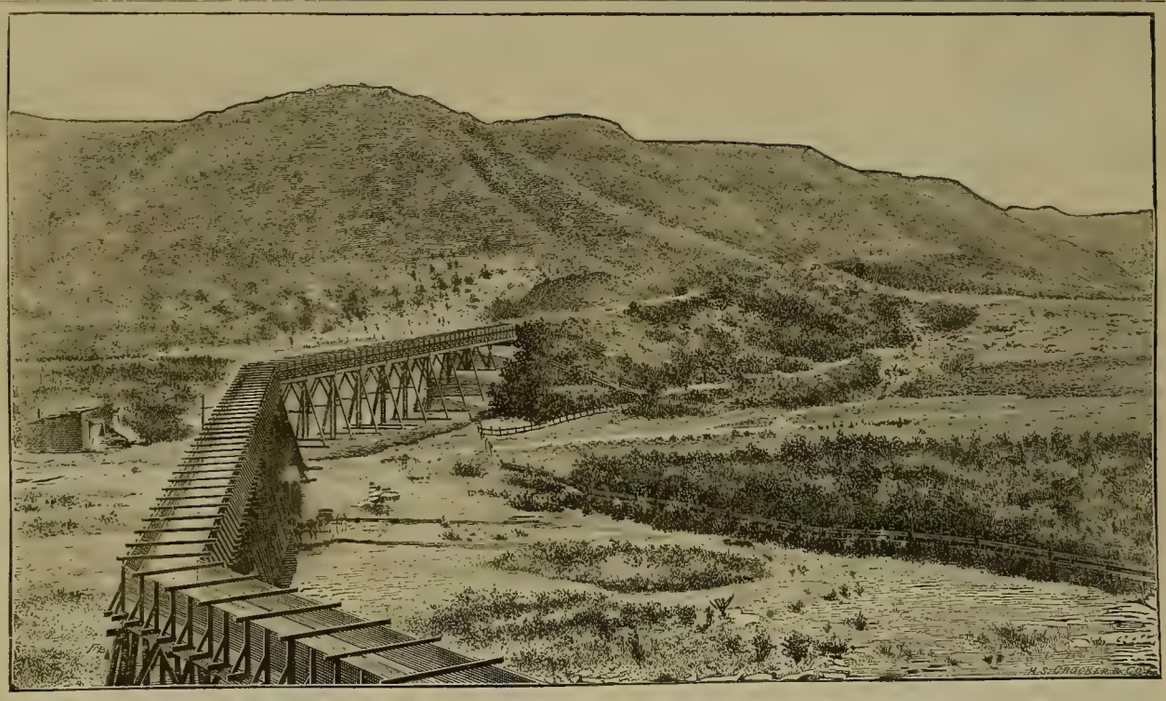
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SAN FRANCISCO, SATURDAY, JULY 27, 1889.

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Artesian Water Supply.

Owing to the peculiar climatic conditions in this State, where we have a rainless summer, the questions affecting the water supply of cities are of great importance, and differ materially from those in other places. Artificial reservoirs ar numerous. The rain-waters of winter and those from the melting snows in summer are retained for use as occasion demands during the dry season. In the southern part of the State, where irrigation is practiced, contrary to the custom of the eastern portion of the continent, water is regarded as of the first importance, and land second. In fact, in some places their relative value is as three to one. Some of the best semi-tropical fruit-growing sections are in arid districts, where the rainfall is exceedingly limited and irregular, and it is absolutely necessary to supplement the rain of winter with copious and frequent waterings during summer. Where there are "artesian belts," of course, such supplies are utilized, and lands in the vicinity are held at high prices.

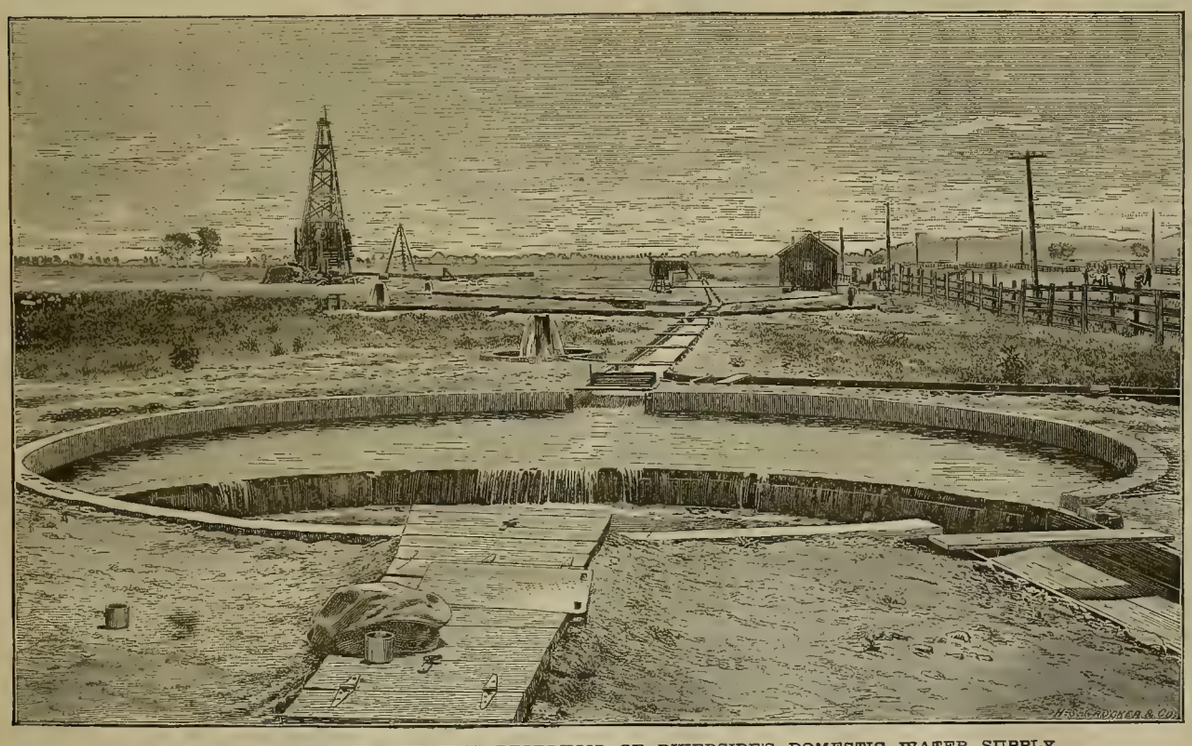


FLUME ON THE GAGE CANAL ACROSS ARROYO SECO CHIQUITO, RIVERSIDE.

In cities and towns in those sections of the State referred to, the water supply for domestic use and irrigation purposes both demand attention. That used for irrigation is frequently unfit for any other purpose, and where it is possible the two systems are kept separate.

At Riverside, San Bernardino, this arrangement has been carried out very successfully, as appears from a pamphlet issued by the Board of Trade.

Water for domestic use is taken from artesian wells upon lands owned by the Riverside Water Co., about eight miles distant, and nearly 200 feet above the general level of the city. From the wells the water is turned into a reservoir of concrete, with a partition, over which it is compelled to flow for the purpose of aeration, and thence through wrought-iron pipes of sufficient capacity to deliver some 3,600,000 gallons daily. The water from these wells is pure and soft and passes directly to the houses of consumers without any chance for contamination. The sketch on this page shows very clearly the arrangement of these wells and reservoir.



ARTESIAN WELLS AND AERATING RESERVOIR OF RIVERSIDE'S DOMESTIC WATER SUPPLY.

The water used for irrigation in and about Riverside is brought in by systems of canals, flumes and open distributing ditches. The water for the canals of the Riverside Water Co. is from the Santa Ana river and one of its tributaries, Warm creek. During the irrigating season the entire flow of the latter stream is taken up before it reaches the river and is conducted through an immense flume two miles in length across the valley of the Santa Ana river, and, after passing through a tunnel, drops over a 40-foot fall into the upper canal of the company, creating a fine water-power at this point, now principally used in generating electricity for lighting the cities of San Bernardino, Colton and Riverside. The capacity of these ditches is enough to irrigate from 25,000 to 30,000 acres of land.

Among other systems for irrigation is the Gage system of canals, which irrigates some 12,000 acres of land. Mr. Gage owns 2400 acres of land, nearly all within the

(*Continued on page 73.*)

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Copper Mines of Calaveras County.

Union Copper Mines, Copperopolis.

EDITORS PRESS:—I visited these mines about a year ago, and at that time wrote up their history. Then the object of the owners was to overhaul the property and put it in working order after its 18 years of idleness, in view of a contemplated sale. This was on the eve of the boom in copper; now that the bottom has dropped out of copper, I expected to find the property in its old-time idleness. Judge, then, of my surprise when I saw that the entire plant was being put in shape on a scale sufficient to extract and handle 300 tons of ore a day. Mr. J. H. Ferson, the superintendent, in exploring the old workings, saw evidences of copper ahead and drove into the country beyond, which was supposed to be barren, and here found copper ore high in grade and unlimited in quantity. In consequence, the owners were not slow in deciding to work the property.

By Mr. Ferson's plans the property is now ready to resume operations on a scale of 300 tons in 10 hours, making it the most extensive copper plant in the State.

Gov. F. L. Ames of Massachusetts is the principal owner, who, with the other owners, have expended over $2,000,000 on the mines. The property is over a mile in length on the vein. The developments are extensive, extending to a depth of 500 feet on the vein. Ten shafts of an average depth of 400 feet have been put down on the course of the vein. From these shafts levels have been run on the vein of various lengths up to 600 feet. These workings show the vein to be from 5 to 40 feet in width, with 100,000 tons in sight. There is on the dumps at this time 120,000 tons of second-class ore, the accumulations since 1861. This ore did not carry sufficient copper to make its shipment profitable, the average being 6 per cent under the present plant. All of this ore can be converted into copper cement at a good profit.

Up to May, 1889, the ores were sorted. That giving 15 per cent and over of copper was sorted and shipped to New York for treatment; all below 15 per cent was piled on the dumps. The output of the mines from 1861 to 1888 was 70,000 tons of high-grade ore, while over 100,000 tons of second-grade accumulated on the dumps. The low price of copper then closed the mines until 1887, when Mr. Ferson took charge, and soon opened up ore bodies exceeding in size and value those of the mines' early history. Stimulated by the rise in copper, the old plant was made to produce from Nov., 1887, to May, 1889, 5000 tons of high-grade (15 per cent) copper ore, which was shipped, while 10,000 tons of ore less than 15 per cent was added to the dumps. All of the ore bodies opened in the mine that gave less than 15 per cent were allowed to stand. In March, 1888, Mr. Ferson made a trial roast of 300 tons of second-class ore, giving the ore a five-months' roast. The results were so satisfactory that the company at once stopped shipments and instructed the superintendent to construct a plant that would treat all of the ores at the mines. Mr. Ferson's plant is now complete, and in simplicity of process, satisfactory results, and absence of theoretical expense, leaves nothing more to be desired.

By the present plant the ore is hoisted from the mines in self-dumping skips which discharge on to screens, the finer ore falling immediately into bins. The coarser ore is fed to rock-breaker, and in turn falls into bin. From these bins cars of 3½-ton capacity are filled by means of ore chutes. Three cars are then drawn by a horse on to the elevated trestles. Under these are piled cord-wood in heaps 350 feet long by 20 feet wide, one foot in depth. On to this wood coarse ore is dumped to a hight of five feet; over this is placed three feet of finer ore. The sides and top of the ore pile are then covered with waste or earth which must be entirely free from sulphur to prevent too rapid combustion and keep the fire under control by means of side flues and ventilating chimneys. The wood is then fired, and the ores, by reason of the sulphur contained in them, burn for a period of six to eight months. The slower or more protracted the combustion the greater the per cent of oxide of copper converted into a soluble sulphate. The roast completed, the surface covering is removed and the roasted ore shoved on to an adjoining leaching floor constructed of tight boards, covered with mastic roofing of three-ply tarred paper, coated over with a paint of coal tar and asphaltum. This floor is given sufficient pitch to make it drain and to further facilitate the flow. Small drains built of coarse rock are laid at regular intervals. The ore piled on to the leaching floor, water is then carried on to the pile by pipe and distributed over the surface by hose and sprinklers. The salts of copper being soluble in water form a solution of sulphate of copper. This solution, as it flows from the bottom of the piles of ore being leached, is led into long sluices filled with iron scrap. Here the saturated solution of sulphate of copper attacks the iron, converting it into a sulphate of iron, dropping the copper as a metallic powder, called "copper cement," carrying 80 per cent of copper. This is dried and sorted for shipment.

Once the leaching plant is well under way, a 50-ton water-jacket copper smelter will be added to the plant for the reduction of the ores carrying 12 per cent and over of copper, all below leaching. A large amount of the ores carry 20 per cent of copper, thus bringing the average up to 12 per cent. When in full operation, the works will produce eight tons of copper every 24 hours, worth at present valuation about $1200.

To describe the company's store, hoists, houses, shafts, large ore bins, system of tracks and the extent of the plant, would require greater space than could be given it in one issue of the PRESS. Suffice it that while there is nothing on the mines of a theoretical or ornamental character, there is nothing omitted that will add to the plant's output, reduce the expense, and increase the value of copper produced. The plant is almost automatic in its operation, and will well repay a visit of inspection by those interested in copper. Mr. J. H. Ferson, the superintendent, and Mr. H. D. Ranlett, the manager, have here brought to perfection a plant the result of their long years of experience, gained in practically working copper ores.

Camp Seco.

On my visit a year ago, I called at the Penn Chemical Works, C. Berger superintendent, a "close corporation." I have no reason to change my opinion formed then, unless it would be to now call it the "closed corporation." The superintendent being of that class that believe in "obeying orders if it breaks masters," acting under instructions, declined to give any information, and in consequence I can state but little in regard to the mine. At present the superintendent is confining himself to roasting and leaching the ores extracted, the mine being idle. This is the only plant in the State working on the latest ideas in copper metallurgy, producing block copper .98 fine. The plant is both extensive and expensive, the large amount of ores in course of roasting and leaching being sufficient to keep up a large output of copper cement for years to come. While I am not at liberty to describe the methods employed, I am confident that if the seal of secrecy were removed from the amiable superintendent's lips, he would willingly contribute his share of knowledge in the treatment of copper ores in the light of all the knowledge of the present day. Adjoining the Penn is

The San Francisco Copper Co.,

R. W. Enos superintendent. This company is confining itself at this time to roasting and leaching the ores previously extracted, the mines being idle. The copper cement produced is exceptionally high in its per cent of copper, the output of copper cement in the past four months being:

	Pounds.
March	41,844
April	37,360
May	56,915
June	57,710

Under Mr. Enos the quantity is increasing and the per cent growing higher, while the discharge water does not give a trace of copper, thus showing that the copper is all saved.

That these are the only copper mines in Calaveras is owing to a want of prospecting on the Serpentine belt on which the copper is found, as this belt extends across the county and is only awaiting capital and development to show other copper deposits of equal size and richness.

E. H. SCHAEFFLE, Ex-U. S. M. E.

Murphys, Cal., July 20, 1889.

Fragments of a Comet.

Edward S. Holden, director of the Lick Observatory, under date of July 18th, says: From measurements made by Mr. Barnard last night upon the comet discovered by him in September last, the following statistics regarding it may be deduced, and, thinking that they may interest some of your readers as well as ourselves, I quote them here:

As I have said in a previous note, this comet, which is now a long way past its perihelion, has lost all signs of the tail which it had when nearest the sun. No doubt the effect of the sun's action upon the head of the comet has become so small at its present distance (253,000,000 miles) that the head is no longer forced to give out those streams of matter which showed to us as the comet's tail; but the comet was subject to immense strains and stress in passing through that part of its orbit nearest the sun, and it is now showing the effect of the forces in the following way: Its body is evidently becoming disintegrated, and the fragments are seen to be streaming behind the comet in the form of a tail directed not from, but toward, the sun.

This mass of matter was measured by Mr. Barnard on July 16th, and his measures show that its least possible length is 430,000 miles, and its least possible diameter is 144,000 miles, so that the fragments which have already broken off from this comet represent cubic contents of at least 70,000,000,000 of cubic miles. The comet itself, which is 165,000,000 of miles from the earth, is still fairly bright, and were it not for the fragments which are seen to follow, it would seem to be in a perfectly normal condition. As it is, we know it must have lost an immense quantity of its original substance.

This is an interesting case to astronomers, as it shows almost palpably the effect of the enormous forces to which every comet is subject at the time of its perihelion passage, and the whole phenomenon forms an interesting commentary on the text that comets, even the stoutest of them, must be short-lived things.

Imported Silver Ores.

The New Treasury Regulations.

Secretary Windom has taken a middle course in the matter of imposing a duty on silver ore containing an admixture of lead. He has not decided at all the question of duty presented to him, but has issued a new set of regulations for the treatment of the ores at the frontier. A circular letter embodying these regulations has been dispatched to the Collectors of Customs at El Paso, Eagle Pass and Laredo. It stated that it is not intended to prejudge the main question, which is still under examination by the law officers of the Government. The regulations set forth in the circular are as follows:

Instructions to Collectors.

1. The sworn entry shall embrace, in addition to what is now required, a statement of the estimated quantities and values of silver and lead contained in the importation, according to the best knowledge and belief of the importer or consignee.

2. The entry shall further contain a declaration that the importation embraces no mixture of ores or concentrates from different mines.

3. The entry shall also disclose the name and locality of the mine from which the ore has been taken.

4. Upon the arrival at the frontier of cars or other vehicles laden with ores containing an appreciable quantity of lead, they shall be locked or otherwise secured until entry be made and a permit granted to unload.

5. Upon the unloading, and at the time of the unloading, the officer of the customs assigned to that duty shall supervise the work and shall obtain proper and adequate samples from those taken for commercial purposes by the importer or consignee—that is to say, they shall be taken in the manner approved and practiced by miners in the handling and reduction of ores, by thoroughly mixing and quartering every tenth shovel or more, repeating the operation until the usual commercial sample be obtained.

To avoid the detention and expense incident to the unloading and sampling at the frontier in cases where the cars or other vehicles are destined to an interior port or place without so unloading, they shall be adequately inspected, and if, in the judgment of the collector, the ore is deemed to contain lead in quantity sufficient to make it dutiable, or if the legal classification be held doubtful, appraisement may be waived and entry made on an estimate of duties and the goods permitted to proceed to their destination under a warehouse and transportation bond. The entry is to be ultimately liquidated under an appraisement based upon the samples selected in the manner above prescribed in paragraph 5.

It is suggested that, in the execution of these instructions, care should be taken equally not to unnecessarily detain the ores wherein silver so clearly predominates as to fix their character commercially as silver ores, nor to admit without assessment of duty those ores wherein the value of their components of lead appears to exceed that of the silver contained in such ores.

It is further advised that in determining the relative values of silver and lead contained in the same ore, the value of the silver component, in the absence of more accurate data in the invoice or otherwise, be rated at 75 per cent of the latest known value of silver bullion in the New York market; and that the value of lead component be rated at the latest known price of bar lead in the same market, less one cent per pound.

From information before the department it is believed that neither difficulty nor hardship will result from the practical enforcement of these instructions, but if any obstacle shall arise in their execution, the Collector is to report the exact nature and extent of the obstruction, with his suggestion for its removal.

The Force of Natural Gas.

Although the wells about Findlay, O., are under control, the tubing is anchored, and the awful force is held under by gates and levers of steel, still it is impossible to escape a feeling of awe in this region at the subterranean energies which seem adequate to blow the whole country heavenward. Some of the wells were opened for us. Opening a well is unscrewing the service pipe and letting the full force of the gas issue from the pipe at the mouth of the well. When one of these wells is thus opened, the whole town is aware of it by the roaring and quaking of the air. The first one exhibited was in a field a mile and a half from the city. At the first freedom from the screws and clamps the gas rushed out in such density that it was visible. Although we stood several rods from it, the roar was so great that one could not make himself heard shouting in the ear of his neighbor. The geologist stuffed cotton in his ears and tied a shawl about his head, and, assisted by the chemist, stood close to the pipe to measure the flow. The chemist, who had not taken the precaution to protect himself, was quite deaf for some time after the experiment. A four-inch pipe about 60 feet in length was then screwed on, and the gas ignited as it issued from the end on the ground. The roaring was as before. For several feet from the end of the tube there was no flame, but beyond was a sea of fire sweeping the ground and rioting high in the air—billows of red and yellow and blue flame, fierce and hot enough to consume everything within reach. It was an awful display of power.

We had a like, though only a momentary, display at the famous Karg well, an 8,000,000-feet well. This could only be turned on for a few seconds at a time, for it is in connection with the general system. If the gas is turned off the fires in houses and factories would go out, and if it were turned on again without notice the rooms would be full of gas and an explosion would follow an attempt to relight it. This danger is now being removed by the invention of an automatic valve in the pipe supplying each fire, which will close and lock when the flow of gas ceases and admit no more gas until it is opened. The ordinary pressure for house purposes is about two pounds to the square inch. The Karg well is on the bank of the creek, and the discharge pipe through which the gas (though not in its full force) was turned for our astonishment, extends over the water. The roar was like that of Niagara; all the town shakes when the Karg is loose. When lighted, billows of flame rolled over the water, brilliant in color and fantastic in form, with a fury and rage of conflagration enough to strike the spectator with terror. I have never seen any other display of natural force so impressive as this. When this flame issues from an upright pipe the great mass of fire rises eight feet into the air, leaping and twisting in fiendish fury. For six weeks after this well was first opened its constant roaring shook the nerves of the town, and by night its flaming torch lit up the heavens and banished darkness. With the aid of this new agent anything seems possible.—*Charles Dudley Warner.*

Car Samples and Mill Returns.

At a meeting of the stockholders of the Savage Mining Co. held last week, at which 80,000 shares of stock were represented, a committee composed of W. N. Griswold, Theodore Fox and others filed a protest, directed to the "President, Secretary and Directors of the Savage Mining Company," in which it was set forth that under the present system of milling, less than 35 per cent of the assay value of the ores was returned to the stockholders. They also protested against the manner in which the superintendent's weekly and monthly statements are made out, and demand that the assay value of the ores at the mine and at the mill shall be given under oath, and filed where the stockholders can see it; and that hereafter, all contracts to mill ores shall be made in writing, and that the mill-owner shall be required to return at least 70 per cent of the assay value at the mine.

A comparative statement was presented, showing that the average assay of car samples during five months of last year was $37.20, representing a total of $186, and that during four of the same months the battery assays only gave an average of $20.11, representing a total of $80.46. Sixty-five per cent of $20.11 is $13.07, which was the amount returned to the stockholders of the Rock Point mill, or less than 35 per cent of the car samples ($37.20).

The protest recommends that the Board of Directors take immediate measures to recover the remainder of the bullion or its cash value. If this should be refused, the protesting committee will call for an accounting.

The Oldest and Largest in the World.

We notice that the enterprise of our friends, the New York Belting & Packing Company, New York, is attracting the attention of the daily press of that city. A writer of the New York *World*, in a recently published article of some length describing the rapidly growing manufacturing interests of Passaic, N. J., speaks of the company's factory No. 2, located there, as follows: "The greatest representative of the rubber industry is the New York Belting & Packing Company, the oldest and largest establishment of the kind in the world. The factory at Passaic is an annex of the original works at Newtown, Conn., but since its establishment here in 1882 it has grown in size and importance, so that it now almost rivals its parent. The Newtown establishment is one of the finest mill properties in America and employs between 300 and 400 men. The New York Belting & Packing Company confines itself exclusively to the manufacture of mechanical rubber, such as belting, packing, hose of all kinds, rubber mats, car, wagon and cylinder springs and bumpers—in short, nearly everything of a mechanical nature for which rubber is used, and owns and controls several patents covering different processes incidental and indispensable to the making of the above goods, and particularly for machine belting, vulcanized between layers of a patent metallic alloy, by which the stretch is entirely taken out, the surface made perfectly smooth and evenly vulcanized. Mr. J. H. Cheever is the treasurer of the concern and J. D. Cheever, deputy treasurer."

PERSONAL.—Mr. W. L. Pierce, secretary of the Lidgerwood Manufacturing Co., and general manager of their principal office, 96 Liberty street, New York City, sailed for Europe, Saturday, July 6th, to be absent two months. Mr. Pierce will combine business with pleasure during his trip abroad, and will visit the Paris Exposition before his return.

Two Scenes in Fruit-Drying.

The two pictures upon this page are timely and suggestive of the dried fruit interest of California. It is true that the apricot harvest in the earlier regions of the State is over and the fruit put in durable form either by canning or drying, but in the later regions the work is not yet done.

The scenes are not presented as prevailing methods either of gathering or of handling after drying, but they represent certain phases of practice.

The engravings are from photographs taken in Southern California. The first represents the gathering of apricots by shaking over canvas spread upon the ground, as practiced in the famous apricot orchard of Dr. Jarvis of Riverside. Though the shaking of fruit upon canvas is the rule in prune gathering and a very excellent apparatus for this work has been invented by Mr. Fleming of San Jose, apricot-growers generally hand pick their fruit, because they are thus enabled to secure it when too ripe to admit of shaking down. Still the experience of Dr. Jarvis, who is a prominent apricot-drier, seems to approve the shaking process. Shaking is usually an easy way to secure fruit of pretty uniform ripeness, but it is not likely that the finest grades of apricots or peaches will be made in that way, although it succeeds admirably with prunes. The bruising results in discoloration of fruit which is to be light colored when dry, while with a black fruit, like prunes, the effect is not so discernible.

The other picture presents the opposite end of the drying practice, for it shows the dried fruit heaped up in the orchard for sacking. This, too, represents only one phase of practice, because it is not customary to finish the fruit harvest in this way after the producer has proceeded further with his enterprise and has secured a packing-house, to which the fruit is carried when sufficiently dried and is there sweated in mass under cover before boxing or sacking; still the picture is a true one from a photograph of an actual scene, and can be taken as evidence with what simple contrivances it is possible to gather a merchantable article of dried fruit in the favoring climate of California. The scene is also suggestive of how cheaply the product can be secured and still yield the grower a living profit. Of course the more careful gathering and the more elaborate methods of processing and packing yield a fancy article which is high priced and costs the grower more to produce. But it is unquestionably true that the world demands an immense quantity of good fruit which can be sold cheaply; so it is a question as to whether the fancy or the ordinary article will in the end bring the greater money to the State and the greater profit to the producer. Now that the orchards are assuming such vast extent, and the labor supply is not keeping pace with it, it seems of the highest importance to discover how the largest amount of good, wholesome fruit can be placed upon the market at the lowest cost of production. This remark applies to the gathering, the pitting and paring of fruits which require them, and the sacking for market. No doubt cheapness of production will be the measure of the greatness to which our dried-fruit manufacture can be profitably extended. The orchard scene during the sacking of the product suggests another important matter. The artist has caught the operatives in variety, and thus shows that in many cases the saving of the fruit enlists the labor of the whole family from grandmother to grandchild. No doubt a great part of our product will always be the result of family labor as it now is. Thus the advantage of small farms and large families is seen as affording a solution of the vexed labor question. The same condition will bring population to our State, thousands of prosperous homes to our vast valleys and productive hillsides, and will enable many thousands to enjoy participation in the blessings of life in California who could never thrive here under the old system of large farms and small use of labor.



GATHERING APRICOTS FOR DRYING IN DR. JARVIS' ORCHARD, RIVERSIDE.

ALASKA MINES.—Advices from Alaska dated July 10th are to the effect that the company working the Bears' Nest mine, adjoining the Treadwell, have struck the ledge. The ore is said to average higher than that in the Treadwell. A mountain of some unknown mineral has been struck. It was thought to be silver, and did carry $2 per ton, but it contains a large quantity of mineral not known. A sample has been forwarded to San Francisco for assay.

JOSEPH MCLANE, who had been working in the Stonewall mine, Cuyamaca mountain, San Diego county, drew his wages and started prospecting. The principal part of his supplies consisted of bad whisky. He camped near the Stonewall about ten days, and there was no sign of his having cooked a single meal during that time, but there were about two dozen empty whisky bottles and demijohns scattered around his dead body. The jury's verdict was that he died of exhaustion, caused by drinking.

Forestry and Irrigation.

B. E. Fernow, Chief of Forestry Division, U. S. Department of Agriculture, was a welcome visitor at the PRESS office one day last week. He had arrived at Portland, Oregon, on the 2d instant, his mission to this coast being twofold—first, to gain a general idea of our forests and the possibility of their natural perpetuation; second, to prepare a report to the Senate Committee on the relation of the Pacific Coast forests to the great irrigation problems which the National Government is investigating.

After visiting Seattle and Tacoma, Mr. Fernow went into the big timber of Mt. Tacoma. The magnificence of these forests he declares surpasses anything he has ever seen. "For twenty miles," he says, "I traveled among red fir and hemlock trees that averaged in hight from 150 to 200 feet, and from 8 to 9 feet in diameter. Many of them would cut over 100,000 feet of lumber. A gentleman with whom I was talking told me that the trees on an entire section, which he had felled, averaged 60,000 feet."

From Mt. Tacoma he went directly to Mt. Shasta, where he spent a few hours in the examination of the characteristic Sierra timber. From this interesting district a jump was made to the famous redwood forests at Cazadero. In regard to these, Mr. Fernow remarks: "The forest is wonderful, wonderful, but from hasty observation it is my opinion that our grandchildren will have no such magnificent timber to cut. Fires have to a great extent worked the ruin of California forests. The constant burning over has not only destroyed the young seedlings, which should be springing up, but the vegetable mold, in which the seed finds it congenial to sprout, has been consumed. After nearly a day's hunt in the redwoods, but two or three little seedlings were discovered growing in the soil, while about twice that number were found flourishing in an old stump where a little vegetable mold had accumulated."

While Mr. Fernow considers the reproductiveness of the redwood by sprouting quite remarkable, he seems to think that these sprouts will never attain great size nor be of much value.

The only two trees which, in his opinion, are satisfactorily reproducing themselves, are the Douglass spruce, and on the drier slopes, the Bull pine.

In his report to the Senate Committee, Mr. Fernow earnestly advocates the preservation of the forest covers of the slopes of the Sierras, and he thinks California should be aroused before her splendid forests are totally destroyed by fire and the woodman's ax.

In regard to the great reservoir and irrigation problem, he thinks the Government is in earnest, and will make all necessary investigation and surveys, after which private enterprise will complete the work of building the reservoirs and distributing the water.

During his call upon us, Mr. Fernow expressed much gratification at the admission of the head of the Agricultural Department to a seat in the Cabinet, and hopes that the Division of Forestry may soon be placed on the substantial footing which its importance deserves. He left this city on the 10th for the Yosemite, after investigating which he purposed paying flying visits to Arizona, the plateaus of Southern Colorado, and the Kansas timber belt, and then returning speedily to Washington, where pressing official duties require his presence.



Photo. by Bonine.

SACKING DRIED APRICOTS IN A PASADENA ORCHARD.

ON the Bear Nest mine, Alaska, day and night shifts are employed on the work of excavating for a foundation for the mill. Other work is being pushed ahead with all vigor possible. The true ledge was struck in the tunnel a few weeks since.

HENRY G. HANKS has sent a communication to the Trustees of the Mechanics' Institute Fair offering to place on exhibition ten eight-foot cases of minerals, duly labeled, without expense to the Institute beyond the hiring of the cases.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Alameda.

THE COAL MINE.—Livermore *Herald*, July 20: Jenkins Richards, superintendent of the Livermore Coal Mining Co., reports that he has begun drifting both ways on the Pen Daren vein, at a depth of 300 feet, and will soon be ready to take out coal. The vein is between 4 and 4½ feet in width. He is not informed as to whether the company will begin shipping coal at once, or await the building of a railroad.

Amador.

UNION.—*Dispatch*, July 20: The prospects at this mine are getting more favorable each day. Last week a stream of water was encountered which is a pretty sure sign that they are approaching the independent ledge of which we spoke some time ago.

COSMOPOLITAN.—Most all the lumber is on the ground for the new mill, the work goes on of opening up the mine; the shaft is down 615 feet and is getting very hard, making sinking slow. The Ginocchio Co. are running their Huntington mill on some very good ore.

HENRY CLAY.—The tunnel is in 260 feet, the ground is a little harder at present; the contract will be finished by August 1st.

GOVER.—The mill has started again after being idle two weeks.

SUTTER CREEK.—Amador *Ledger*, July 20: The additional building at the Wildman is now rapidly assuming the shape of a mill. The mortars are on the ground ready to be placed in position, and probably in three weeks more the additional stamps will be ready to drop. The company has furnished the mine with a new 1000-foot wire rope. The new compressor that was received from San Francisco three weeks ago will be operating the Burleigh drills in the mine. This will be an important change, as the rock is exceedingly hard.

MANDICH.—*Ledger*, July 20: This claim, between five and six miles east of Sutter creek, was bonded a few months ago by S. D. R. Stewart, who spent considerable money in the erection of a six-stamp mill and other surface improvements. As soon as the ore on the dump was crushed the ore body seemed to pinch out, and work was suspended. In June the term of the bond expired, and the property fell back into the hands of the original owners, Mandich Bros. and Leggett. S. Mandich and D. Leggett have been working on the property for six weeks. They have sunk two winzes, 45 feet apart, the farthest being 80 feet from the mouth of the tunnel. This winze is 22 feet deep, with from four to five feet of ore at the bottom, the ledge increasing in size as depth is attained. Samples of the rock taken from this winze were shown us this week. It is a dark-looking quartz, liberally sprinkled over with specks of free gold. Mr. Mandich informs us that all the ore prospects big in free gold. The samples shown us we should judge would yield at the rate of from $12 to $20 per ton, to say nothing of sulphurets. There is about 60 tons of ore on the dump, but it cannot be crushed for lack of water.

KEYSTONE.—A body of ore, about 20 feet wide, has been struck in this mine, north of the shaft, between the 900 and 1005-foot levels. The rock is of good quality, showing plenty of sulphurets and some free gold. Its extent is not known at present. It may prove to be only a bunch, but present indications are favorable for a good ledge.

MISCELLANEOUS.—At the Zeile the repairing of the shaft is about finished, and the starting of the mill to its full capacity is only a question of a few days. The force of miners will be materially increased. The prospecting operations at the Morley or Wetzlar claim continue without any change to note. Quartz is met with frequently, but not in the nature of a defined ledge. At the Kennedy, sinking is being prosecuted in both shafts. Twenty stamps of the mill are kept going, which is as much as can be hoisted while sinking is going on. A cleanup was made at the cement gravel claim at Volcano, operated by a French company, last Sunday, and we are informed the result was highly satisfactory. The owners are greatly elated at the outlook. It looks as though this cement mining would bring about an important revival of mining industry in Volcano and vicinity. At the Amador gold mine men have been put to work again on the reservoir. It is freely reported in Sutter creek that the Mahoney mine has been sold to the Eastern company that owns the Wildman mine adjoining. The consideration is stated to be $60,000. We give the statement merely as a current report. The Bunker Hill mill is running 20 stamps.

Butte.

GOLDEN GATE MINE.—Gridley *Herald*, July 13: About 100 men are at work on the Golden Gate mine, on the Feather river three miles above Oroville. A flume 50 feet wide, six feet deep and 3300 long is nearly completed. It is expected considerable gold will be taken out of the claim this fall. The river bed to be worked is known to be exceedingly rich. This is another of Major McLaughlin's mining schemes, and he has induced foreign capitalists to invest in it. He is the manager, while N. A. Harris is superintendent.

Fresno.

MINARET DISTRICT.—Cor. Fresno *Republican*, July 20: Hearing of the great richness of the Minaret mining district, 100 miles northeast of Fresno, I concluded to visit the mines. We found in camp Mr. Chapman of San Francisco, a well-known mountaineer and railroad man, and Geo. Senn, a mining expert of that place. We at once proceeded to examine some of the mines. They are undeveloped and none of them have been prospected to a greater depth than four feet. All of them showed heavy rock containing metal. On the following day five of us rode for four miles amid meadows, mountains and lakes, and came to another group of mines. The ledges are of immense size and in cap rock. One was prospected to the depth of two feet and showed rich indications. Here I located a claim, which, in the opinion of Mr. Senn, is the best part of the district that he had examined. There is considerable pine, tamarack, fir and juniper in the canyons, but timber is very scant on the high grades. Water privileges are abundant, there being three streams large enough to supply any power required. After 30 years of prospecting in various parts of this State I can give it as my unbiased opinion that I have never found a district equal to this for the extent and quality of its mineral resources. The only drawback is its isolated situation.

Inyo.

CERRO GORDO.—Inyo *Independent*, July 20: Rumor is current that the same parties who have got control of the Cerro Gordo mines have also secured the water-power on the Eastside Canal. At the Eclipse there is a drop in the canal of 25 feet. This will give a large amount of power, and it is said that a 60-ton furnace will soon be built there for the reduction of lead ores. There is still a possibility that a marble-mill will be built there; power enough can be supplied for these or more works.

Mono.

THE BODIE CON.—Bodie *Free Press*, July 22: During the past week West Crosscut No. 2 from north drift, 1200 level, was advanced 15 feet. East crosscut, same level, was driven 15 feet. There were employed 10 miners, 1 foreman. During the past week west crosscut from south drift, 1200 level, was advanced 21 feet. There were employed 6 miners, 1 foreman. Jointly with Bodie upraise from south drift, 1200 level, was extended 9 feet, connecting with winze from 1000 level. West crosscut from upraise was driven 21 feet.

Nevada.

HARTERY MINE.—Grass Valley *Union*, July 20: Orlando Stoddard, who has the contract, has commenced the erection of hoisting and pumping works on the Hartery mine, and will have the building completed and the machinery ready for operation in about four weeks. The machinery will be driven by steam-power. The incline shaft of the Hartery is down 700 feet, but the mine is tapped by a drain tunnel 1700 feet in length at the depth of 300 feet. Below this two levels are opened, and when the mine was worked last, some four years ago, on the tribute system, some very high-grade ore was taken out. Work was suspended then because of negotiations for the sale of the mine, which subsequently fell through. The mine has lain idle since that time, but the pay shoot that is known to exist will be opened up by the new company that will soon have things in shape for regular and systematic working. The Hartery is on the famous mineral belt to the south of Grass Valley and on the west side of Wolf creek, and is situated between the North Star and the once famous Allison ranch, and has always been regarded with favor by the miners of the district.

QUARTZ AT MOORE'S FLAT.—Grass Valley *Union*, July 18: E. G. Creller and Wm. Reynolds went to Moore's Flat on Tuesday to look at the Abrams quartz claim, located within a short distance of that place. The claim has been opened by tunnels driven on the ledge, from the face of the hill. One of the tunnels is in a distance of 700 feet, and the ledge shows a variable width, being generally strong. The lowest crushing made from the quartz has gone over $4 to the load, and some from the same location has yielded over $100. The claim is well situated for working, as all the quartz and waste can be run out of the tunnels by cars, doing away with the necessity of pumping or hoisting. There is also plenty of free water for milling purposes to be obtained below the site of the mine, to which the ore can be sent down by tramway or ore-chute. There is no mill built on the property, Mr. Abrams having devoted all of his labor to prospecting the claim by running tunnels on the ledge. The prospect is considered an excellent one, and justifies the erection of a mill by which operations may be carried on regularly and systematically.

MINING TRANSFERS.—*Tidings*, July 19: A controlling interest of the Gold Hill mine will surely pass into the possession of the syndicate represented by Whittaker Wright of Philadelphia. In fact, the mine is now practically in the possession of the syndicate, the stock to be paid for in 90 days at the rate of 40 cents a share. One of the other properties negotiated for by the syndicate has also practically passed into its hands. Two or three other adjoining claims may also be transferred, in which event the syndicate will own one of the richest and largest mining properties in the world. In fact, the Oro Flat, Gold Hill and the other claim alluded to comprise a piece of mining property second to none, and too valuable in the hands of capital to remain idle a day longer than can be avoided. The syndicate has in late years sunk from $1,000,000 to $3,000,000 in British Columbia mines, and is now withdrawing from that country in favor of the Grass Valley district, where it confidently expects to more than recoup itself.

THE MANZANITA DRIFT MINE.—*Transcript*, July 20: A pan of gravel taken at random Thursday from the old tunnel of the Manzanita drift mine yielded about $9 worth of gold. Of course the whole lead does not pay like that, but rich spots are frequently encountered. The new tunnel is now in 150 feet, having been advanced 64 feet in the last week. It will tap the channel at a distance in of something like 1500 feet, and will probably reach gravel in from three to four months hence. Two shifts of three picks to the shift are employed.

THE SEVEN-THIRTY AND BOWERY.—*Tidings*, July 12: D. B. Lynch exhibited to-day some specimens of quartz taken from the old dump on the Seven-Thirty and Bowery (consolidated) claim. This property is situated in Deadman's Flat, and is noted for its "pockets," two miners once taking out $5000 in a day. The deepest shaft on the claim is down but 140 feet, yet $100,000 has been extracted from time to time. The prospects are that a hoisting and pumping plant will be put up before long and development work actively prosecuted.

IDAHO MINE.—Grass Valley *Union*, July 22: Regular shifts are now working on the No. 14 level of the Idaho mine, but no hoisting of quartz to the surface is yet being done. The steam pumps are at work pumping the water from the shaft below the No. 14, and fair progress is being made. There is a large body of water below filling the 15th and 16th levels, and it will take some weeks to drain them. The mine is found in good condition as the water is lowered.

THE DERBEC MINE.—*Transcript*, July 18: At the Derbec drift mine there are 135 men on the pay-roll and about 125 working steadily. This is as big a force as has ever been employed there. Under Supt. Galavotti's very intelligent and energetic management, good results are being obtained.

Placer.

FOREST HILL DIVIDE.—*Placer Herald*, July 20: At Yankee Jims there is but little being done in the mines. Harry Adams has been putting the Red Sea in a good condition for work. He has laid iron rails, and from this fact and other signs it is reasonable to believe that the company means business. Charles Trafton is at work at his tunnel which is now about 800 feet in length. This tunnel, when completed, will be low enough, he thinks, to work the Dardanelles, Mountain Tunnel and several other mines. Mr. Trafton has been pushing the tunnel alone for several years and we trust his labor will be rewarded. T. Gilbert is running a drift for a top lead in the Ben Franklin. The Dardanelles has been shut down temporarily. Superintendent Dodge is running a drift above the tunnel in the Biker Divide ground. At the Mayflower there is every indication that the gravel is as rich as ever. The gravel is not wholly blue, but assumes various shades, being chocolate, gray and blue colored in different parts of the deposit. The tunnel is 5585 feet in length; 750 feet of it is an incline, followed by a level 50 feet in length. From this level to the gravel is an upraise of 30 feet. From the tunnel gangways have been run up and down the channel, which extends in a northerly and southerly direction. The north gangway is 666 feet, and the south gangway 784 feet in length. From these gangways upraises or chutes have been run to the gravel above. The pay gravel has a depth of six feet. Between chutes one and two in the north gangway a body of yellowish-colored gravel and cement has been met which contains considerable water. This new deposit is entirely different from that of the Mayflower, not only in color but in kind, being a quartz formation. Some think this is the Orono channel, but it has not been sufficiently prospected and explored as yet to ascertain its extent or from what quarter it comes. It is less than 200 feet in width, as the Mayflower gravel comes in again near chute number two. The main channel, like all other channels, varies in width. The gravel is hard and compact, requiring powder to dislodge it. The cars are pulled in and out by mules, the ordinary number of cars to a train being 16. The mill is run night and day. The 20 stamps are constantly pounding away, and the company is preparing to put in 10 or 15 more. The compressor at the big shaft has been removed to the mouth of the tunnel and assists in running the drills and in ventilating the mine. Just at present 135 men constitute the working force. As many as 200 have been employed at one time. The mine and mill present a busy scene, and there is every indication that the channel will continue to yield its golden harvest with all the profusion that has characterized it since the mine was opened. Twelve men are employed at the Breece and Wheeler mine. Mr. Breece is preparing to open up the breasts in such a manner as shall give room for a large force of men to work. The pay gravel is a foot in depth. The bedrock is shelly and is rich in gold. The gravel is dark and cemented, and from some specimens shown us by Mr. Breece must be extremely rich. The gravel was literally packed with gold nuggets from the size of a cucumber seed to a pigeon's egg. In one shallow crevice 30 feet in length $14,000 was taken out a short time ago. The tunnel is in over 8000 feet. No Chinamen are employed in this mine. T. N. Hosmer has discovered a new channel under the Willett channel, that was worked in 1854. He thinks the deposit is 1000 feet long. The gravel at present pays good wages, but he expects to find bigger pay shortly.

Shasta.

SQUAW CREEK.—Redding *Free Press*, July 13: Work in the numerous mines on Squaw creek is booming. From Ben Conroy we learn that the Balaklala is still producing its quota of gossan ore, rich with silver and gold. The rock is being tossed on the dump for future operations. We believe that it is the intention of the company owning the Balaklala to put in a mill and crush the ore on the spot, instead of sending it below for reduction. It is reported along the creek that operations on the Black Bear mine will soon be commenced again. This property is owned by Riley & Bliss, the latter being a partner of Vice-President Morton. The mine is generally regarded as a splendid piece of property. The Central mine, in the Old Diggings district, which has been idle for nearly a year, is also reported to be on the point of resuming work. This mine is owned by Riley and Whitehouse. It is said that Frank Satterlee of Iron Mountain will hereafter superintend the Central mine. The superintendent of the Walker Brothers' mine is reported to have said that his force is at present working on a 20-foot vein of $20 rock. This, if true, would make it appear that the Walker Bros. never made a better investment. The Sierra Buttes M. Co. has a force of over 65 men at work. This company is preparing to work the Uncle Sam mine on a much larger scale. Ten stamps will shortly be added to the milling capacity of the plant. A force of men is constantly employed hauling logs to the sawmill, and a tramway one mile in length, reaching from the mine to the mill, is now being constructed. The sawmill, besides turning out timber for the mine, is cutting lumber with which to erect dwellings for the employes and their families, sheds and other necessary buildings. The laborers receive $2 per day and found. The Squaw creek wagon-road lacks but three-quarters of a mile of being finished. Forty-five men are employed, and the work is being pushed as rapidly as possible.

FROM ANOTHER SOURCE.—The following additional items were sent in by a correspondent after the above had been put in type: J. McTimmons has bonded his mines to some parties who have also bonded the well-known Clipper mine, though I have heard that the latter is a short bond. Judging from the mining men that have passed "Saints' Rest" to-day, a large force of men will soon be put to work. The Snyder mine, owned by San Francisco parties, has another tunnel in something like 500 feet. The ore is low grade, but I venture to say there is more quartz in that tunnel than in any other on Squaw creek. J. N. Vannoy is hard at work at present running a tunnel to tap the Joseph E. Johnson ledge 150 feet below the surface.

FRENCH GULCH.—Shasta *Democrat*, July 17: All the mines surrounding this camp are in a prosperous condition. There are more different properties here paying dividends than any camp in California can boast of. The oldest mines that have not done much for years are becoming great. The new ones are above their owners' expectations, and the working forces have been increased in a great many. The old Washington has uncovered a large body of high-grade ore. The Highland owners are building a mill on Clear creek. Frank Wheeler is running his mill on ore he hauls on sleds for near a mile down hill and 1500 feet perpendicular above the mill. The J. I. C. company has a chute of ore opened. It is 75 feet long and averages $80 a ton, the west face being immensely rich. The Gladstone company is crushing ore from the Helena, which they handle six times before it gets to the mill. The lower tunnel on the Gladstone will reach the ledge in 25 days, giving backs of 450 feet, then no more deadwork will have to be done on the three mines until this is worked out. Some prospectors are opening up a ledge between Clear creek and the Highland, which will make a chain of mines in a straight line from Deadwood, Trinity county, to the head of Grizzly gulch, Shasta county, a distance of 16 miles, and gold and silver ledges are found between this point and Squaw creek.

Sierra.

MILL.—*Mountain Messenger*, July 20: After some delay, Mr. Leak has got a Pelton wheel, to run his Huntington mill on the Montpelier quartz mine at this place. The mill has been running eight or ten days, altogether, and is capable of crushing, so Mr. Leak says, about 12 tons in 24 hours.

PIKE CITY.—We learn by letter, from Pike City, a four-feet and eleven-inch ledge, of fine rock, was struck in the Sun Flower, and, as far as prospected, the ore will yield $20 a ton. By November 15th a mill will be running. The tunnel is in 5791 feet from mouth to ledge, 386 feet through hard rock. This is liable to prove valuable mining property.

DRIFT CLAIM.—J. H. Pierson, one of the stockholders in the St. Charles Hill drift claim, about four miles by trail, northwest of Goodyear, called on us, Wednesday, and reported six men employed, preparing for the thorough development of that valuable mining property. This force will be largely increased when the boarding-house is completed; 800 feet of tunnel has been run, 300 feet through gravel that prospects very good.

Siskiyou.

QUARTZ.—Yreka *Union*, July 17: Mr. Geo. Simmons, an energetic prospector of Humbug creek, found a rich quartz ledge last week, specimens from which show a great amount of gold visible to the naked eye. The McConnell claim on Klamath river, just below mouth of Humbug, is now paying well, and good returns are expected from now until the winter rains commence. The Centennial claim, just below Honolulu, on the Klamath, is also paying well, with better prospects ahead as the work progresses along the pay channel. The Mott Co. had their head and wing dams broken to some extent a short time ago, by the foundations giving way, but will soon have the repairs completed, to commence hoisting out pay gravel in a short time.

RIVER MINERS.—The river miners at mouth of Scott river, on Klamath river, and above and below, are rapidly progressing with the completion of wing-dams, with expectation of soon being ready to hoist pay gravel. The river is strong and deep at this point, requiring more work than farther up stream, although easier this year than usual on account of the stream being lower than ever before known since settlement by white people. Vance, Churchill & Autenrieth have been striking rich prospects of gold in Yreka creek, at their water works' pit, near the Miner-street crossing, and may succeed in being able to secure a good haul of gold as well as plenty of water. Charley Humphrey, who has a rich ledge of quartz on Humbug creek, sold out last week to Price & Co. of San Francisco for $15,000.

AT HUMBUG.—Yreka *Union*, July 20: Mining at Humbug continues to receive marked attention, and different parties have a good thing there and are doing well. An engine is on the way to that locality, to take the place of water for quartz-crushing. Mining has not run out in Siskiyou by a good deal.

San Benito.

QUICKSILVER.—Hollister *Free Lance*, July 19: W. F. Dalzell informs us that last week the firm of Griffith & Dalzell & Woodie Bros. shipped to San Francisco 26 flasks of quicksilver, worth nearly $1800. It was all taken from the Gypsy mine.

San Diego.

ASBESTOS FROM THE DESERT.—San Diego *Sun*, July 19: The first carload of long-fiber asbestos from the desert mines, 25 miles southeast of San Jacinto, is being shipped through that city for Hoff & Bates' Asbestos works at Pacific Beach. A carload of short fiber from the Elsinore mines is also ready for shipment. Mr. Hoff said to-day that they had found the long fiber was best for boiler covering and the short fiber for paint.

HOISTING WORKS.—Julian *Sentinel*, July 20: Gov. R. W. Waterman has come south for the purpose of recuperating his health, and also to watch the progress of the work of putting up a set of new hoisting works for the Stonewall mine. He awarded the contract for doing this work to C. L. Lind of San Francisco, and they will cost between $50,000 and $75,000. The Governor will also cause four or five miles of pipe to be put in to carry the water from the Cold spring to the mill and town.

WASHINGTON.—Messrs. Keener and Dilks are making the dirt fly in the Washington mine. The shaft is down 35 feet, and is now inside the old works. Mr. K. says it has been left for them to unearth the boss bonanza of the camp.

Tulare.

AT DUNLAP.—Tulare *Times*, July 18: The shaft on the 99 mine at Dunlap, owned by residents in this city, has been sunk to a depth of 104 feet, and a contract has been let to run a crosscut in the lead. A ton or more of the rock was sent to S. F. a week or two since for a working test, and the returns were satisfactory to the owners of the mine. The lead has widened considerably at the depth of 104 feet, and the character of the rock has also greatly improved. After the crosscut has been run, and everything proving as satisfactory as at present, the tunnel abandoned some time since will be continued in on the ore body and the mine fully developed.

Tuolumne.

DISCOVERY.—*Independent*, July 20: A nice discovery has been made by a certain party who has

been working for some time on a quartz lode, within two miles of Sonora. He has at last "struck it good." At a depth of five feet the vein is 2½ feet wide, and growing wider in sinking. The rock prospects $12 per ton in free gold. Our informant states that we can look out for another Sonora bonanza.

NEVADA.

Washoe District.

CON. CAL. & VA.—Virginia *Chronicle*, July 20: The usual quantity and grade of ore is being extracted from the various openings on the 1400, 1435, 1500, 1600, 1650 and 1950 levels. On the 1300 level ore is still being extracted from the main south drift, spoken of in the last report, but is of low grade. On the 1650 level: The stopes on the 7th and 11th floors above this level continue to yield ore of fair quality. Stoping ore from the upraise which connects with this level. The north drift from the bottom of the winze, down 60 feet below the track floor of the south drift on this level, is extended 332 feet, continuing in porphyry and quartz of some value. On the 1950 level the incline winze in the vicinity of the old stopes in the south end of the mine is down 55 feet. This winze is being sunk on an ore streak of good quality, four feet in width. During the week 1099 tons and 400 pounds of ore were shipped to the Morgan mill; 1555 tons to the California mill. The average assay value of all the ore worked at these mills during the week, according to battery samples, was $30.50. Bullion valued at about $12,000 on hand in the assay office. Shipped to the Carson mint during the week bullion valued at $42,935 90.

OCCIDENTAL. — From the top of the south winze connecting with the 350 level a south drift is out 102 feet. Formation in porphyry and quartz showing value. On the 350 level are extracting ore, and are preparing to stope out ore on the 400 level. The mill is nearing completion and will be crushing ore during the coming week.

UTAH.—On the 600 level the north lateral drift from the main west drift is advanced 218 feet; formation vein porphyry with streaks of quartz. West crosscut No. 3, 50 feet south of the upraise, is advanced 40 feet and cut the west wall.

BELCHER.—The winze below the 1100 level west crosscut is down 36 feet, the bottom in quartz, assaying from $5 to $10 per ton. The 1200 level south drift is still showing spots of ore, the face entirely in quartz.

CROWN POINT.—Have started a raise above the 350 level northwest drift to tap the ore cut on the 300 level. The 300 level south drift is showing fair-grade quartz.

SILVER HILL.—Usual progress made in advancing the 800 level northwest drift and the northeast drift. The raise above the southeast drift is still in porphyry.

UNION CON.—On the 1465 level, west crosscut No. 2 from the north lateral drift is advanced 91 feet and in porphyry intermixed with clay and fine lines of quartz.

CHOLLAR.—Quartz still showing in the 750 north lateral drift. The 850 level north drift is out 533 feet. The 650 level west crosscut is in low-grade quartz.

HALE & NORCROSS.—Explorations in progress on the 400, 500, 600, 950 and 1300 levels. There is a large area of ore stripped ready for extraction.

GOULD & CURRY.—On the 400 level west crosscut 1160 feet north of the south line, is extended 147 feet. Formation quartz and porphyry.

SIERRA NEVADA.—On the 520 level from the shaft station, an east drift is advanced 856 feet and continues in porphyry, with some water.

MEXICAN.—On the 1465 level the north drift from west crosscut No. 1 is extended 113 feet, continuing in porphyry and quartz showing value.

OPHIR.—On the 1465 level, in the east drift from the shaft station, 275 feet in. An upraise is up 79 feet, continuing in porphyry and clay.

CONFIDENCE.—The joint Challenge Imperial 500 north drift is out 95 feet from the Jacket shaft, and the face continues in low-grade quartz.

SAVAGE.—Exploratory work in progress from the 400 to the 900 level. The total bullion yield of the mine in June was $30,928.72.

NEW YORK CON.—The upraise above the 800 level west crosscut is showing a breadth of four feet of ore assaying $30 per ton.

POTOSI.—The 750 level south drift is out 561 feet, in porphyry and quartz. The 550 level west crosscut is in clay and porphyry.

BEST & BELCHER.—On the 1000 level the northwest drift is extended 91 feet. Formation porphyry with streaks of quartz.

EXCHEQUER.—The north drift on the 500 level is in porphyry. The 382 level west crosscut is still in barren quartz.

SEG. BELCHER.—The east drift from the raise above the 1100 level has cut several streaks of low-grade quartz.

ALTA.—The usual amount and grade of ore is being crushed. The 927 level stopes show an improvement.

YELLOW JACKET. — Shipping 100 tons of ore daily, showing an average assay value of above $25 per ton.

IMPERIAL.—The 300 level north drift is out 257 feet from the south line; the face is still in clay and porphyry.

JUSTICE.—Shipped 200 tons of ore to the mill, showing a value of above $28 from battery sample assays.

SCORPION.—The joint east drift from the 520 level of the Sierra Nevada shaft is out 856 feet.

BALTIMORE.—Nothing new in explorations in progress on the 338 and 22 levels.

BULLION.—Still exploring the 760 level quartz belt. No change in formation.

OVERMAN.—Repairing drifts and shipping small quantities of ore occasionally.

ALPHA.—The 500 level west crosscut is showing streaks of quartz.

ANDES.—Still sinking the winze below the 300 level in quartz.

Esmeralda District.

ESMERALDA CON.—Walker Lake *Bulletin*, July 17: A private cable just received from London says that the annual meeting of the Esmeralda Con. Mining Co. passed off quietly, and that $300,000 was subscribed then and there to carry on the work on a more gigantic scale. The property owned by this company is located at Aurora.

Eureka District.

EUREKA CON. REDUCTION WORKS.—*Sentinel*, July 20: A number of men have been employed at the Eureka Con. Reduction Works since the fire cleaning up the debris, and the carpenters are at work putting up a new building over the boilers. From the position in which the ore lies it will be necessary to build an incline track to hoist it to the new feeding floors. No. 2 furnace will be fitted up, and that alone will run for the present. The ore floors in the future will be situated on the hill above the furnace, where all the ore that is now coming in is being dumped, so that it can be fed into the furnace without an expensive and complicated hoisting arrangement, which it is intended to do away with. The buildings to be erected for the present, we learn, will be temporary and for the purpose of cleaning up in the least expensive manner the ore on hand.

WORTH THINKING OF.—If the contemplated reduction in freight on ore is carried into effect, it will not be long before the E. & P. railroad will be humming and buzzing with renewed life. There will be more mines opened in this district than ever were thought of before, and the timbers, mining material and general supplies that will be needed as the result, will put dollars into the pockets of these railroad people where cents do not drop at present. It is understood that the E. & P. Railroad Co. made a clean million during the first year of their operations. It would be no trick for them to make a million a year if an opportunity were afforded to our miners to work their low-grade ores with profit.

Pioche District.

BIG PUMP.—Pioche *Record*, July 18: The work of repairing the big pump at the Raymond shaft is practically finished and it is expected to start work during the coming week. The principal work going on about it now is bracing the column and attending to minor matters generally. Work on the boilers, new and old, is also about finished, insuring an abundant supply of steam, and we hope next week to be able to report the pump as successfully at work.

Red Mountain District.

PROSPECTING. — Virginia *Enterprise*, July 18: Some prospecting is again being done up at the old Red Mountain district, eight or nine miles to the northwest of this city. At one time there was quite a lively little town at this point. Many long tunnels were run and a great number of shafts sunk. There are scores of quartz veins in the district and some of them are immense ones. Good prospects may be obtained in not a few of these old mines. It is probable that below the water level some would prove rich. The whole district shows indications of having been subjected to great heat—vast volcanic fires. These may have volatilized the silver and driven it out of the upper parts of the veins. Though some gold is found in the district, the main veins have the appearance of being principally silver bearing. The old district deserves a careful examination in the light of our present knowledge of mining and prospecting.

Tuscarora District.

BELLE ISLE.—*Times-Review*, July 20: North drift, 150-foot level, extended 18 feet; face shows favorable with a little water.

COMMONWEALTH.—South drift from No. 3 winze, below 150-foot level, extended 10 feet, opening up a good body of ore. South drift from No. 1 west crosscut, 225-foot level, extended 11 feet; total, 16 feet in ore, some of which is high grade. South intermediate from No. 2 chute extended 16 feet in the vein. The 230 tons of ore sent to the mill have been taken from all parts of the mine, showing an average battery assay of $126 per ton. Bullion shipped, $15,809.76.

GRAND PRIZE.—Work has been resumed in the face of the west drift from north crosscut; vein is large, but low grade. Stopes are yielding and looking well. Work in other parts of mine was suspended and the 400-foot station cut in readiness for the pump, a portion of which is now in place. The concentrator is running steadily and doing good work.

NEVADA QUEEN.—Work has been suspended on 550-foot level, as the expense is so great, hoisting through North Belle Isle winze and hoisting from 450-foot level at the same time; 350 tons of ore have been sent to the concentrator, and 18¾ tons of ore worked at the mill; battery pulp assay $348.36 per ton.

NORTH COMMONWEALTH.—Sixty feet east of No. 1 upraise, No. 2 upraise has been carried up 14 feet in vein, 10 feet of which is low-grade chloride ore. A drift has been started south from No. 1 crosscut, 65 feet from the main south drift. The face shows some good ore.

NORTH BELLE ISLE.—The work below the 400-foot level will be suspended, pending the sinking of the shaft and the opening up of the 500 and 600-foot levels.

DEL MONTE.—East crosscut No. 1, 100-foot level, extended 12 feet; face all in ore. North drift, same level, extended 6 feet.

NAVAJO.—Upraise on east vein, south end, 350-foot level, extended 6 feet; total hight, 44 feet, still in high-grade ore.

ARIZONA.

MINERAL PARK.—Cor. Mohave *Miner*, July 20: The Keystone mill was shut down for a few days while putting in new flues, but is humming away again with plenty of ore on the dump. Foreman Uncapher tells me the mine is looking well and that portion of the company recently here departed well pleased with the outlook. Tom Stinson and about a dozen others are moving to some claims at the summit of Surrum's peak. Of course, Mineral Park is their headquarters.

LEASES.—Thomas Roberts has taken a lease on the Indian Boy. George Dougherty, who has a lease on the Alpha mine, brought in five tons of ore this week, which worked to his satisfaction. The strike recently made by John Hughes south of Stockton continues to grow richer as work on it progresses. C. H. Park has purchased the interest of Lamson, Hudgeons & Henson in the extension of the Queen Bee, and the mine will hereafter be known as the Jennie Foote. Mr. Park has let a contract for the sinking of the shaft to the depth of 100 feet. The sampling works have worked the following lots of ore since our last report: Tyler & Conkey, two lots, lease on C. O. D.; Harris & Co., lessees on C. O. D., two lots; Martinez & Co., from the Cedar district, two lots; C. O. D. mine, 30 tons; George Dougherty, two lots; Alpha, five tons. J. M. Dawley came in from the Monarch mine Saturday last and reports that Superintendent Beattie had found the ledge, and that the slip was not so bad as at first reported. Water was also struck. C. H. Park and E. S. Henson have obtained a lease and bond of C. E. Sherman on the Queen Bee mine at Mineral Park. They shipped to the mine this week a large supply of provisions and a lot of tools, and will put several miners at work running drifts and sinking shafts, and will open out the mine.

BRITISH COLUMBIA.

SIWASH CREEK.—*Truth*, July 18: Henry Van Buskirk of Vernon writes that prospects on Siwash creek are exceedingly favorable, and a great many people are flocking in and locating claims. He also states that the right of Indians to prohibit the working of claims by whites on their reserve is not yet settled.

DAKOTA.

BULLION DAY. — Deadwood *Pioneer*, July 17: Regular mid-month cleanups were made at the belt stamp-mills yesterday. Gold bullion, aggregating $160,000, goes forward to-day.

THE CHAMPION GROUP.—It is announced that the Champion mill will soon begin dropping 10 stamps on ore from the Highland Mary, one of the group of claims owned by the company at Spruce gulch. The ore runs from $3 to $13 per ton, but has to be sorted, as a good deal of it is refractory. The mining reporter is informed that the company proposes putting in concentrating works, and henceforth operating on an extensive scale. It is also hinted that more territory is to be acquired, and that several neighboring claims will soon be purchased.

IDAHO.

THE HUB MINE.—Wood River *Times*, July 17: The examination of the title of the Hub mine, near Era, was completed last Saturday afternoon, and resulted satisfactorily. The deed to the property was therefore taken up out of escrow, and the new owners took possession at once. The price paid is $90,000. The new company will lease the Bannack mill at Era for a few trial runs, and will in the meantime have new reduction works made in Denver. A few months hence a large force will doubtless be employed at the Hub.

NOTES.—Idaho Springs *News*, July 19: The Mary Foster people have been adding to their working force. Freeland working light force of men, mine not looking so well as usual. Lamartine working usual force and keeping up its lick; leasers all getting rich. Silver Age concentrator running satisfactorily and mine outputting plenty of ore. Two small retorts of gold from the Casino were sent to the company in Ohio this week. Clarissa mine has struck a large body of ore. Had to run for it farther than expected. Oneida working usual force of men and running mill constantly, making large shipments. The Kitty Clyde is employing the usual number of men and is turning out considerable good ore. Ute Creek turning out lots of high-grade ore. In fact Ute is so prosperous it has a faro layout. Mattie mine shipments not so large as usual, part of force engaged in retimbering the shaft. Plutus working quite a force of men, and mine looks splendid, producing plenty of good ore. Kooken & Brown have set up a whim at their shaft on the Casino, which they are sinking another lift of 60 feet. The battery in the custom mill that has been running on Cleveland dirt makes the best cleanup of any battery in the mill. Dove's Nest working quite a force and outputting lots of ore which will be sent to their mill here soon as road down Robinson Gulch is repaired.

LOWER CALIFORNIA.

CRYSTALLIZED GOLD.—San Diego *Sun*, July 20: Among the recent discoveries made on the Peninsula is that of some remarkably rich crystallized gold from a region about 50 miles below Almo. A small quantity was brought to the city to-day, of which five ounces were obtained by Gen. C. H. M. y Agramonte. These specimens, he says, are pseudomorphic orthoclase. That is, the cavity in the rock formerly occupied by a bunch of crystals, which were removed by decomposition, was afterward filled by the gold by deposition. One of the most beautiful features of the specimen shown is that it is composed of minute dodecahedrons, the form of crystal which gold often assumes, but rarely shows to as good an advantage as in this case.

NEW MEXICO.

PACIFIC.—*Southwest Sentinel*, July 18: The Pacific Gold Mining Co.'s new 20-stamp mill, situated just above town, is about finished. Everything is in readiness to start up tomorrow morning. The mill is in all respects a complete one, and just what the company needs for the reduction of the ores produced from their mines at Pinos Altos. The machinery consists of a large Blake ore-crusher, four batteries of five 850-pound stamps each, patent feeders, settling pan, five Gilpin County concentrators and such other things as are useful or necessary in a mill of this kind. The machinery is driven by a 60-horse power engine, which is supplied with steam by two large boilers. The mill will consume about 40,000 gallons of water per day. The mill will probably reduce from 40 to 50 tons of ore daily.

PINOS ALTOS.—Silver City *Enterprise*, July 19: The Wagner mill is running ore from the Little Mountain Key. The Carlotta, the southern extension of the Golden Giant, now the property of Toby & Co., is looking well. Recently work was resumed and the outlook for a bonanza mine is quite flattering. Recent assays from the Continental, belonging to Fox & Pritchard, show a value of six ounces of gold per ton, at a depth of 67 feet. The crevice is widening as depth is gained, and the outlook certainly indicates that the owners have a fortune in sight. Ore hauling began last Monday from the Pacific mine, to the mill of that name near Silver. Three six-mule teams are employed. Work has been resumed on the Golden Eagle. Carson & Fisher have made preparations to sink the shaft 60 feet, making a total depth of 100 feet. A tunnel is being driven on the Oro Fino location, to the point of contact of the porphyry and granite. All indications point to the existence of a vein at the contact. Osborne & Co., the owners, are confident of success. The Mountain View is still in bonanza, and the changes, if any, in the vein value of ore are for the better. In the new shaft, all indications point to the close proximity of the rich telluride vein for which the mine is justly noted. Present development now denotes that the ore chutes have a southerly inclination, and affords conclusive evidence that the richness of the vein will be found to the southward. To date, the mine has produced $20,000, an output dating from the discovery and location of the property.

MONTANA.

POLLOCK AND GLENGARRY.—Butte *Inter-Mountain*, July 20: At a recent meeting of owners of the Pollock and Glengarry, it was decided to separate the two mines, and they will be operated as separate concerns hereafter. The Glengarry will be in charge of Carney & Hand from now on. The property has five different veins, only two of which are of any size. The mine has produced over 72,000 ounces of silver, and has been worked 300 feet on one of the veins at a depth of 150 feet. Mr. J. R. Boyce, Jr., has received returns from the last shipment of gold from the Red Lion mine, which was sent to the United States Mint at Helena. The gold is shown to have been 993 in fineness, and therefore worth $19 to the ounce. This return is encouraging to the stockholders. Ed Hicks, superintendent of the Climax mines, regrets the position into which the properties have fallen, but says they are meritorious mines and will yet come out all right. Captain Couch this morning informed a reporter of the *Inter-Mountain* that water had nothing whatever to do with the temporary suspension of a portion of the work at the Mountain View. The water supply comes from the mine itself, and is the same now as it always has been. The work which has caused some of the men to be laid off is the putting in of a new pump and surface condenser.

OREGON.

BONANZA KING.—Bedrock *Democrat*, July 18: The Bonanza King, near Haines, is rapidly coming to the front as one of the bonanzas of this district. Saturday evening we interviewed one of the proprietors, who displayed specimens of iron sulphurets which assay $40 to the ton. This property will some day be recognized as one of the greatest producers of the camp. The Bonanza King is working ten men—three eight-hour shifts at present. News reaches us of numerous strikes in the vicinity of Susanville and Robinsonville. The Smith Bros. & Lane have opened a magnificent store at Susanville which will supply the entire country thereabout, Big Creek, Ruby Creek, Elk Creek, and the Green Horn districts. These points are all tributary to Baker City, but unless some attention is paid to the roads, the trade will drift to Pendleton. The mining property at Cracker Creek, owned by Mrs. Miller of this city, is being rapidly developed. According to all indications it will not be long before this property is yielding forth golden returns. The Chicken Creek placer mines are being worked with might and main. These diggings have been worked for several years, always paying liberal returns for the work expended thereon. A party of young men have opened placer claims on the divide between Burnt river and Connor creek. They report "blue gravel and bedrock pitching," which, according to pure English, means "everything is lovely and the goose hangs high." The Murphy Bros., Joe and Sam, have a valuable lode at Cable Cove. The rock assays well and the boys state that in the near future a mill will be erected that will stamp out the shining metal to the tune of $40 per ton. L. H. Johnstone of Robinsonville arrived in the city Saturday. He brought a rich specimen of ore from his claim in that district, which he bonded, while here, to Baker City parties for $5000.

UTAH.

PARK NOTES.—*Record*, July 20: An unusual amount of prospecting and development work is being done on the various claims up Thaynes canyon, and ere long the result will be more producing mines added to the list. The owners of the Disappointment are making ready to ship some ore the coming week and they expect to be well repaid for the effort. The Comstock, which adjoins the Disappointment, is undergoing vigorous developments and the ore body will soon be reached by the lower tunnel which is now in over 100 feet. The Jupiter leasers are making up a shipment of high-grade ore and it will soon be moved to market.

THE CONCENTRATOR STARTED UP.—The early part of the week the new custom concentrator (the Union) was started up on Woodside second-class ore. All the machinery worked smoothly, and there is no doubt that the capacity of the works for treating 100 tons of ore daily will be fully reached. W. V. Rice is manager of the new concern and Thomas M. Stringer is foreman and assayer. The Union will be of great benefit to the camp in stimulating the development of our mines, for with a charge of only $2 a ton for treating ores many thousand tons of crude ore hereabouts which in their present state would not pay to ship to the smelters can now be made marketable at a profit.

RUSSELL PROCESS TESTS.—The merits of the Russell leaching or lixiviation process, which has been satisfactorily in operation at the Marsac mill since the first of the year, are becoming better known and much interest is shown by mining operators by making inquiries and sending sample lots of ore from all parts of the country to be tested by this process. C. A. Alisky, a Washington Territory mine-owner, was the last one to have a sample lot of his ore tested. The result was very gratifying, for over 95 per cent of the value of the ore was extracted. Mr. Alisky contemplates putting in a Russell leacher at his mines to treat the ores, because he now knows that better results at less cost can be obtained by the Russell process than by any other method. A carload of ore from Australia arrived yesterday to be experimented on by the Russell process and undoubtedly satisfactory results will be obtained from the test.

MECHANICAL PROGRESS.

Nails From Tin Scrap.

We have already in these columns made mention of the fact that good merchantable nails have been made from tin scrap. Mr. Oberlin Smith of Bridgeton, N. J., who is associated with the inventor of the mechanism by which this nail is made—Mr. George H. Perkins of Philadelphia—read a paper at a recent meeting of the Institute of Mining Engineers, in which he describes at length the manner in which this new industry has been developed:

Many troubles and much study and expense has attended this development in order to reach a method of doing the work thoroughly and economically. Old tin cans, tin plate and sheet-iron scrap, as such material is thrown aside into the waste heap, is collected and pressed by powerful machinery into plates of proper form and size, from which plates the nails are subsequently formed, much after the usual way of nail-making from rolled-nail plate.

Much difficulty was at first met with from the nails splitting in even the most tightly folded corrugations, which could not be reached by the machinery first devised; but this difficulty has finally been overcome and a perfect nail has been produced. The machinery which was at first in separate parts has now been united into one complete automatic machine. It has been very much simplified and made enormously strong and heavy. It is adapted to cutting, crushing, gripping and heading the nails at one operation, and can be run as fast as an expert operator can feed the material. Its feed probably varies, with jagged, irregular scrap, from 30 to 90 nails per minute, although straight strips of sheet metal can easily be fed by hand into a machine running as high as 240 strokes per minute.

During the course of our experiments, says Mr. Smith, various forms of nails have been tried. Among others were straight cylindrical nails with conical points; straight, square nails with pyramidal and with wedge-shaped points; hexagonal nails, etc. The most practical form, however, seems to be the square taper nail, which has about the same shape as the ordinary cut nail, but is somewhat stronger and a good deal tougher. It is well adapted for all ordinary purposes, but is especially suitable for a roofing nail, since the tin coating prevents much rusting, and is good to solder to.

The economy of this system of nail-making is obvious. The scrap can be bought for about 17 cents per 100 pounds, and a boy can make perhaps 100 pounds of nails per day. The most economical system of manufacture will probably be to run one or more nail machines at each large "tin-shop," set as close as possible to the presses which produce the scrap, so as to avoid the expense of unnecessary handling, and the extra tangling-up incident thereto.

The Tin-Scrap Heap to Become a Thing of the Past.

The author of the paper, which we have condensed as above, in his opening remarks, writes somewhat facetiously as follows: It may surprise metallurgists who read this paper to learn that, by a recent discovery, nails of good quality can be made at one operation, directly from the ore, at the rate of, say, 60 per minute for each operator. It should be stated, however, that the raw material referred to does not answer strictly the ordinary assayer's definition of an ore. It is found, in strata of various thicknesses, in Harlem, N. Y., and other localities where the debris from restaurants and from sheet-metal factories of various kinds has been dumped. In other words, it is old and new tin-scrap—one of the few substances which this generation, mainly occupied in exhausting the accumulated resources of the past, seems to have laid up, by way of atonement, for the benefit of posterity. In speaking of this material as *ore*, we are simply looking forward, prophetically, to the time when our descendants may dig it up and write learned papers for the American Institute of Mining Engineers, upon the best methods of assaying and smelting it.

At least, such has seemed to be its destiny hitherto. It may fairly be said that the many attempts which have been made to utilize it by separating, through chemical or electrolytical processes, its two valuable constituents, metallic tin and first-class wrought iron, have failed, either technically or commercially. The reasons for such failure need not here be discussed. Either the separation has been incomplete, the iron still retaining enough tin to spoil it for the sinking fire or other use short of remelting (perhaps even for that) or the manipulations of the process have been too expensive to make its results profitable—or both. Meanwhile the great tin-scrap deposits have gone on growing faster than any other strata of our Post-Tertiary, Psychical era; given up by metallurgists, not yet attacked by geologists, and explored only by that mining engineer of the transitional period, *Gulielmus Caper*.

Before leaving these heaps of tin-scrap, however, to become mere mineral deposits for future ages, it may be well to consider a novel plan for their immediate utilization—novel, not only in its means but in its principle. For it undertakes to use this material just as it is, without trying to separate its constituents at all; and to use it, moreover, for a purpose in which the qualities of both these constituents, namely, the tensile strength and ductility of the iron, and the resistance of the tin to corrosion, are directly employed with advantage. I refer to its manufacture by mechanical pressure into nails.

FORGING BY PRESSURE OR BY BLOWS.—Very many forging presses are now in use for making large and heavy pieces, and the relative effect on the work is thus summed up by Prof. Kick, who has published in the *Technische Blatter* an interesting account of the experiments he has made on this subject. The difference between static pressure and that which results from a shock consists, he says, in the duration of their action. The weight of the hammer and the hight of the fall determine the total energy expended, but the power of the shock for a given expenditure of energy itself depends on the compression produced in the object struck. The feebler this compression is, the greater is the relative force of the blow to the pile. He has made some comparative experiments between the effects produced by an ordinary pile-driver striking upon an anvil solidly fixed, and by a balistic hammer, or one where the driver and anvil are both suspended like pendulums, so that the anvil is free to move. He has found that within rather large limits the work employed in the deformation of an object under the action of the shock only depends upon the product of the weight of the driver, and the hight of the fall for hights varying from 0.50 to 3 meters. The test pieces were small copper cylinders, fitted on to the same rod, and of the same initial dimension, 16 9 mm. long, 12 mm. in diameter, and weighing 18.4 grammes. One of the series has been submitted to the action of an ordinary driver, and the other to that of a balistic driver, taking care to obtain equal shocks under the two conditions. The weight of the anvil of the balistic driver was to that of the driver in proportion of two to one. The experiments have shown that a greater deformation is obtained by the ordinary than by the balistic drivers, all other things being equal. With the latter, a calculation of the proportion of force transmitted to it can easily be made, and it was found that 30 per cent of energy was expended. Other experiments made with the same apparatus have enabled the necessary energy of both to be determined on analogous eprouvettes.

THE WORLD'S PROGRESS IN IRON AND STEEL. An interesting paper has been published by Mr. James Neilson of the Massend & Summerla Iron Works of England on the production of iron and steel in Great Britain and the other competing countries during the last ten years, in which he draws a comparison between the increases made in 1886 in the competing countries compared with 1877. With a tariff of $7 per ton America had increased its make in ten years by over 3,000,000 tons, or 145.59 per cent; Germany, with a tariff of $2.50, showed an increase equal to 134 92 per cent; Belgium, with a tariff of $1, an increase of 48 04 per cent; Austria-Hungary, with a tariff of $2.18, an increase of 51.59 per cent; while Great Britain, the great free-trading country, produced 6,608,664 tons in 1877, and in 1886 the production was 6,870,665, being an increase of only 3.96 per cent. He also pointed out that the increase in the make of Bessemer steel had in ten years increased about 300 per cent in the United States, 200 per cent in Germany, 575 per cent in Russia, and a little over 100 per cent in Great Britain; and he argued that if the manufacture of steel alone had in this country increased in the same proportion as the other competing countries, an addition of two and a half millions of money would have been distributed in wages to the working classes.

AMERICAN PLATE GLASS.—It is only quite recently that plate-glass manufacture has been introduced into this country, and yet it is claimed, says the *American Manufacturer*, that the largest and best plates of glass in the world are now made in Pittsburg, and that difficulty often arises in their transportation owing to their size, the railroad tunnels not admitting them. Two plates, 14x16 feet, were recently ordered for use in a Philadelphia building, and it was found to be impossible to get rail transportation for them. Arrangements were therefore made to have them shipped by river to New Orleans, and thence by sea to Philadelphia. As an index of the progress made in this industry, it may be remarked that in January, 1888, a store in Detroit had a plate of beveled glass 13x7 feet and three-eighths inch in thickness, imported from England, which was claimed to be the largest in the United States. The plate above alluded to, as recently made in Pittsburg, is more than twice the size of the last mentioned at Detroit.

A STILL MOOTED QUESTION.—It still seems to be an unsettled question whether wood can be ignited by the heat of a steam pipe in contact with it. It is admitted, theoretically, that it is impossible for wood to take fire at a temperature of 212 degrees, or somewhat higher; but it is well known that there have been a large number of cases of fire reported as occurring from this cause, and the evidence is very conflicting.

ENORMOUS ENGINES.—Three new vessels in the Italian navy—Re Umberto, Sicilia and Sardegna—are each to be provided with engines to develop the enormous force of 22,800 indicated horse-power. Previous to 1881 the greatest power put into one ocean vessel was about 8000 indicated horse-power.

SCIENTIFIC PROGRESS.

The Grand Canyon of the Colorado.

This remarkable phenomenon of nature extends over 200 miles along the Colorado river, varying in width from 10 to 15 miles and in depth from 4000 to 8500 feet, rising in a series of terraces, often beautifully colored and marked and frequently castellated and peaked. The channel is winding and sometimes very narrow, whose somber recesses the sun's rays rarely visit. The river is broken by numerous falls of from 50 to 200 feet in descent, and countless rapids, whirlpools, swirling eddies and miniature maelstroms, wherein lie bowlders, are ofttimes churned about like pebbles in a mill-race by the fierce current.

The country the Grand canyon is situated in is a very rough one, thinly settled and out of the beaten paths of travel, and that, with the extreme difficulty of entering it either from above or by the perilous waters below, have conspired to keep one of the greatest wonders of the world a veritable terra incognito. A careful examination of the country and its formation has convinced the writer that the old theory, as taught in our text-books of geology, that the Grand canyon is the result of the erosion of water for many millions of years, and the attempt of some to approximate the age of the globe by calculations based upon the supposed time necessary to wear down 7000 or 8000 feet of stone, is altogether untenable and inconsistent with our present knowledge of its topography. The whole region gives unmistakable proof of once being a sea-bottom, by the water-worn rocks, deposits of salt, fossils, coral, etc., to be found everywhere. It now has an altitude of 500 to 6000 feet, the result of volcanic upheavals, and it is to this that we can look for an explanation of the Grand canyon. This gigantic uplifting of the earth's crust caused huge fissures to occur in the soft sand and silt through which the torrents of escaping waters tore with irresistible fury, gouging out the upper part of the existing channel in a comparatively short time. This accounts for its great width from side to side and also explains the cleavage of the Buskin mountains, which rise 2000 feet above the level of the canyon's banks and could never have been the work of erosion. The basaltic formation in many parts of the canyon, the immense beds of scoriæ known as malapai rock, which everywhere abounds, the silicified forests and the great craters of extinct volcanoes in Northern Arizona, all point to a time of volcanic activity, when those twin monsters of the primal world—fire and water—contended for mastery.

The first stratum of the canyon, which extends down several hundred feet, is a sandstone, next comes a shale or slaty formation, and underneath lies a bed of limestone, which in some places, notably Marble canyon, seem to be much deeper than at others. In this limestone silver is more or less to be found. Next comes a stratum of salt. That near the junction of the Little Colorado with the parent stream has been mined for many years by the Supai, Moqui and Ed City Indians. Below this rock salt comes the primeval granite, hard as adamant and bearing gold in some places.

These canyons have a peculiar interest to the ethnologist, they having once been the home of prehistoric man. Many ruins of these Cliff Dwellers are to be seen, and sometimes a rare find rewards the patient explorer in the shape of unique pottery or curious copper implements, hardened by an admixture of silica, now a lost art. Who were these mysterious people, and what was the cause of their sudden extinction? Whether an awful pestilence swept them into oblivion or the armed hordes of some fiercer tribe tore them from their peaceful homes will always be one of the dark secrets of that strange land. Many of their habitations are almost inaccessible—perched on some dizzy cliff, necessitating the use of ropes to reach them.—*Ex.*

Edison's Latest Phonograph.

Mr. C. E. Norton, who has been associated with Mr. Edison in his laboratory, is now in this city, as agent for the introduction of the improved phonograph. He has given a large number of exhibitions of this wonderful machine in the presence of public associations and private parties in this city. In every case his exhibitions produce great surprise, perplexity and admiration, at this, one of the latest of the many wonderful achievements which the seer of Menlo Park has given to the world.

At every exhibition, his audience, whether great or small, hang over the mysterious machine and eagerly drink in the music of brass bands, the glowing words of our leading orators, and the melodious voices of some of the best songsters of the country. Eleven rubber tubes are connected with the phonograph and as many persons listen to each piece. Faint intonations can also be heard by an entire room full of listeners, even without the aid of the rubber tubes for conveying the sounds to the ear. The cylinders which reproduce the sounds are covered with wax instead of tinfoil, which was used in the early phonographs. This wax is specially prepared by being heated to 900 degrees. Each impression on the wax will reproduce 5000 times and can be used for 100 impressions.

One of the features of the machine is a knife which shaves off any impression when desired. Edison is now at work on another kind of wax, in which really lies all the secret of the invention. He is trying to get a flat sheet of wax, which, after being impressed, can be folded up, put in an envelope and sent to any part of the world and there reproduced, as was done with the tin foil.

One difficulty to be overcome in these will be the creases, but Mr. Edison has struck on a tiny platinum ball, which can go over them and yet not lose a single word. When this feature is accomplished, it will probably supersede stenography, and can be used for amusemen as well as convenience.

The wax impressions are capable of being electrotyped, so that the utterances of great orators and the sweet sounds of famous singers, as well as the more inspiring airs of military bands, can be reproduced a countless number of times for the delectation of audiences thousands of miles away.

Edison is now endeavoring to produce a machine, both perfect and cheap, so that it can be in the hands of everybody for use as a correspondent, stencgrapher, and for amusement.

We understand that these machines are not sold, but are leased to parties for a stated sum per month, as is done with the telephone.

To Tell the Weather.

Benjamin Franklin was the first to discover that storms in this country travel from west to east. He was interested in observing an eclipse, and found that while the observations were spoiled in Philadelphia by a rainstorm that came on just at the beginning of the eclipse, the sky was clear at Boston until after the eclipse was over. By communicating with intervening towns he learned that the storm traveled eastward at a uniform rate. Simultaneous observations taken in all parts of the country show that nearly all great storms follow the same general direction—from the west to the east. The same is true of cold or hot waves. Therefore, to tell what the weather will be, in advance, we have only to find out the conditions prevailing west of us. This is practically the course pursued by the signal service.

The direction of a storm is frequently diverted by some local cause. A low barometer, or large amount of moisture in the air, attracts a storm, and may either change its course entirely or hasten its advance. The rate at which a storm travels between two points is, in fact, calculated by the gradient or decline of the barometer from one point to the other. When a storm is advancing, the wind blows to meet it. Thus, a wind blowing from the east or southeast indicates the approach of a storm from the west. When the storm center has passed, however, the wind changes and follows the storm. If a person has a good barometer and a wind gauge, he can tell pretty correctly when a storm is coming. Without the instruments the clouds may be watched, and when seen to be moving rapidly from the southeast, and there are indications of the presence of much moisture in the air, a storm is not far away. The old Scotch saying that

> A red sky at night is the shepherd's delight,
> A red sky in the morning, shepherds take warning,

Is partially true in this country. The red sky in the morning indicates an excess of moisture in the air, and a storm is therefore likely to occur before many days.

The circle around the moon, or lunar rainbow, shows the presence of moisture in the air. Moisture at a high altitude produces a large bow and at a low altitude a small bow. The smaller the bow, therefore, the nearer is moisture, and, consequently, the sooner will the storm develop. The old saying that the number of stars to be seen inside of the circle indicates the number of days before the arrival of the storm is not reliable, as the position of the moon in the heavens may make the number great or small without regard to the storm conditions. All attempts at predicting the weather for months in advance are mere guesswork. Such superstitions as trying to foretell the severity of a winter by the thickness of the breastbone of the goose or the fur of animals originated in some obscure quarter, and are not worth the circulation and attention that they receive.—*Prof. Daniel Draper in Chicago Inter-Ocean.*

A CURIOUS REGION.—The State of Florida presents some of the most curious phenomena in regard to its rivers and lakes of any State in the Union. One of the latest discoveries is that of a subterranean passage in the Santa Fe river, three miles northwest of High Springs. A spot about 14 feet in diameter has been found having no bottom. The water in this particular locality is unlike that surrounding it, having a decidedly bluish cast. Rails pushed a short distance down into this hole disappear, never to return. All attempts to find bottom have thus far failed.

BRIDGE OSCILLATIONS.—A number of seismograph observations of value have been made on the new Tay bridge by Prof. Ewing of the Dundee College. The instrument, which was placed on the southernmost portion of the great girders, records the vibration during the whole time a train is on the bridge; and it appears that as the train comes on at the Dundee end, 1½ miles away, oscillations of 1-500th inch are observable, increasing as the train advances to a maximum of one-half inch.

GOOD HEALTH.

Health of the State.

The monthly circular of the State Board of Health for June gives reports from 80 towns, with an estimated population of 728,700, showing a total mortality of 854, which is a percentage of annual mortality of 14.04, an exceptionally small death rate, and indicates how little serious sickness was present within the State during the month of June. Consumption is credited with 139 deaths, less than the usual monthly mortality. Pneumonia—The number of decedents from this disease decreased to 35, or 20 per cent from the previous month. Bronchitis caused 18 deaths, which is a slight increase. Congestion of the lungs is credited with 16 deaths, the greater number occurring in young children. Diarrhea and dysentery were the cause of 23 deaths, which, while a decrease from last report, indicates a great frequency of these diseases. Cholera infantum was fatal in 22 instances, which also shows increasing frequency of the disease.

Diphtheria was fatal in 26 instances. Croup was fatal in six instances. Whooping cough, although quite prevalent, and in some places epidemic, only records three deaths as a result of the disease, which indicates an unusual mildness of its type. Scarlet fever caused five deaths. Measles was fatal but in two instances. Smallpox caused no deaths. Typho-malaria fever, although reported as prevailing, caused only one death in San Francisco.

Typhoid fever is credited with 31 deaths, which is an increase of ten over last report. Remittent and intermittent fevers caused one death in Marysville. Cerebro-spinal fever is credited with causing six deaths. Erysipelas was fatal in four instances.

Cancer has caused 42 deaths, the very large increase of 17 over last month's report. Heart disease is credited with 51 deaths. Alcoholism was fatal in six instances. Thermic fever, or heat apoplexy, is credited with causing two deaths in Stockton. The particulars of these cases were not received. No other deaths from this cause are reported within the State.

Reports of sickness throughout the State indicate that a minimum amount of disease prevailed during the month of June. If before the warm days and nights come upon us we would see that our cities, towns, villages and dwellings were properly cleaned and divested of all possible sources of corruption—that our drinking water was pure and our air untainted by human filth, then even extremes of temperature would have very little effect in engendering disease or shortening our lives.

The Prevention of Disease

Is an object which should engage the attention of health boards and health officers throughout the State. Without the greatest vigilance on their part, disease will continue to enlarge our mortality lists and cast reflection upon our sanitary progress. Nurses and physicians attending diphtheritic patients should avoid, as far as possible, the infection of their persons and clothing, several cases having been recorded of the conveyance of the poison by those parties, they themselves remaining well. Where diphtheria is prevalent, parents should daily inspect the throats of their children before sending them to school, and if any inflammation appears they should be kept at home, as it is these cases of mild diphtheria that are the most common source of propagating the disease, being allowed to mingle with other children, drink out of the same cup, play with the same toys, and even kiss each other, without fear of consequences. No parent is justified in sending children to school when infectious disease is present in his house, no matter what its character.

Bath-Rooms for Schools.

Wisconsin educators and newspapers are discussing a proposition to establish baths in the public schools.

This might be urged on purely hygienic grounds in nearly every city, and good reasons for establishing such baths be fully proven; but the fact still remains that every man has a right to administer to his own health. Be such arguments, says a writer in the San Diego *Union*, as they may: I want to use a few inches of your columns in setting the value of such public baths in a different light, which is, if people don't bathe all over with soap and water as often as once a week, they emit an offensive odor that renders them unfit associates for wholesome people. Those who live with non-bathers are often accustomed to such odors and the thing is overlooked; but such people have no right to foul the air for those who are forced to associate with them, as in schoolrooms.

This sickening odor is not only met with in schoolrooms, but in public libraries, Y. M. C. A. rooms, churches, lodges, parties, balls, and in most all places where people congregate. Although, perhaps, San Diego may not have more than its proportion of non-bathers, yet it is less excusable here than in a cold climate, where the shock of putting very cold water on the warm body is by non-bathers considered unhealthy, and where they are poor, they cannot afford, perhaps, to supply hot water to please those they come in contact with. There surely is no reason why a person living in San Diego, where an abundance of semi-warm, soft water is at the hand of every man, woman and child, with soap at five cents a cake, should go about reminding one of the cry of Ben-Hur's mother: "Unclean! unclean!" They should not wait until some person next to them moves or changes his seat, or some one refuses another dance, or to wonder why their presence is not sought, but should bathe regularly, as often as once a week. Of course this is a question that a man cannot talk of to a man who reminds him of the subject, as the non-bather feels insulted, although he feels no compunction about carrying his nauseating presence into the society of hundreds. The schools would seem to be proper educators in this important branch.

Regular and constant bathing should be followed. If not from any selfish motive derived from feeling clean, saving laundry money, warding off disease, and being stronger and healthier than from your love for your fellowmen, bathe, and try and have the children taught to bathe.

DANGER FROM SCARLET FEVER.—The imperative need of burning everything that cannot be thoroughly disinfected which a scarlet-fever patient has used is fully illustrated by the following incident when that dread disease was undoubtedly communicated by a book which had been carefully laid by for 26 years. The Boston *Post* says: In 1846 a boy of eight years, the brother of the narrator's wife, was taken down with scarlet fever and died. One of the principal amusements of his illness had been looking over a large picture-book. After his death this, with several other useful playthings, was packed away in a trunk. Twenty-six years later, in 1872, the sister-in-law of the editor took this trunk with her on a journey which she made to England, where he was then residing. The trunk was opened the second day after its arrival and the picture-book was taken out and presented to the editor's two-year-old son. During the next fortnight the little fellow was attacked by scarlet fever. It was a wonder to the doctors who were called in consultation how the disease had been contracted, as there had been no scarlet fever in the town for years. At last it occurred to the editor that the picture-book might have transmitted the disease, and the medical men in attendance, on being told the facts connected with it, agreed that it had retained the poison for 26 years and communicated it to the child.

THE London *Medical Press* says there is talk of applying telephones to the infectious wards of the French hospitals, so as to enable the sick people isolated in their contagious sufferings to have the comfort of hearing their relatives' voices without any risk of conveying infection by an interview.

THE BRAIN of the late Laura Bridgman, the blind, deaf and dumb girl, is undergoing a microscopic examination at the hands of Dr. Donaldson at Clark University, Worcester, Mass.

USEFUL INFORMATION.

"The Latest."

The latest fashionable idea is for black silk underwear. To buy a pair all made is expensive, but one can make them at home at a less cost. Get four ounces of Heminway's underwear silk; this is made specially for the purpose, and comes in cream white, light pink, salmon, lavender and black shades, and is 60 cents an ounce skein.

Cast on 99 stitches and knit across plain. Use No. 8 needles of bone, rubber or wood.

Second row—Narrow, knit 2 plain, make 1, knit 1 plain, make 1, knit 4 plain, slip second stitch over third, and repeat 11 times.

Third row—All seam knitting. Repeat second and third rows until you have four rows of open work.

Now knit 6 times across in plain knitting, then 4 rows of open work, 6 rows of plain knitting, 2 rows of open work. Then knit in ribs 4 plain, seam 4 alternately, until you have finished 75 rows or a little more if you wish, then seam where you knit 4 plain, and knit plain where you seamed 4 for 4 rows (count the rows on the right side), reverse again for 4 rows; this finishes two blocks. Bind off all but 12 stitches, knit 36 rows plain knitting for shoulders. Now knit the other half of the undervest the same way, and sew together to first block, then sew the shoulders down to the back half. Crochet a row of holes round neck and sleeves, and finish off the holes with a shell edge. Run ribbon in holes and tie in a bow.—*Chicago Inter Ocean.*

THE YEAR 1900.—Although the year 1900 will be divisible by four, still it will not be, as is usually the case, a leap year. Twelve years must elapse before the interesting event takes place; but it was just the same in 1800 and 1700, but not in 1600, for that was a leap year, and the year 2000 will be a leap year also. Why this should be is a problem. To explain in detail would be a tiresome task, but it rests upon the principle that a difference of 11 minutes per day exists between actual time and calendar time. Thus, a year is computed at 365¼ days, three years being 365 days long and the fourth year 366 days. In fact, the year is 365 days, 5 hours and 45 minutes long, or 11 minutes short of 365¼ days. The leap year every four years is said to have been an invention of Julius Cæsar's. To allow for this difference of 11 minutes per year, one leap year was dropped every hundred years. But this was found not to be exact, and Pope Gregory XIII in 1582 made an improvement and decreed that every centurial year divisible by four should be a leap year. Thus, by omitting the leap year for three centurial years and letting it remain as usual on the fourth centurial year, a system is obtained so close that it would take thousands of years to make up another day's difference in time. The calendar time is still not exact mathematically, but as no change will be necessary for 4000 years, it will not fail to the share of the present generation to correct the discrepancy.

METALIZING AND POLISHING WOOD.—The wood should be steeped in a bath of caustic alkali for two or three days, according to its permeability. The temperature of the bath should be from 164° to 190° F. This done, place in a second bath of hydrosulphate of calcium, to which a concentrated solution of sulphur has been added, in which it should remain 24 to 36 hours. A third bath should then be used of acetate of lead, at a temperature from 95° to 120° F., in which the wood should remain 30 to 50 hours, according to its permeability. Then after being thoroughly dried it is in a condition to be polished with lead, tin, or zinc, as may be desired, finishing the process with a burnisher. This done, the wood apparently becomes a piece of shining, polished metal, with a hard, smooth surface; but, unlike metal, it is not affected by moisture.

THE OILING OF ROUGH WATER BY SEA BIRDS. The English *Army and Navy Journal* prints a letter from a naval officer, who suggests that the ancients, who knew the value of oiling troubled waters, learned this method from observing sea-birds. All the fish-eating birds, cape-pigeons, petrels, and the like, eject oil from the mouth when captured. In the South Atlantic and South Pacific sea-birds have been noticed floating in spaces of comparatively quiet water when the sea around was rough. The unusual smoothness of the water was evidently due to considerable quantities of oil deposited by the birds.

TO WARM ROOMS.—A simple stove for warming rooms by means of solar heat has been contrived by Prof. E. S. Morse. It consists of a shallow box, having a bottom of corrugated iron and a glass top. This device is placed outside the building, where the sun can shine directly into it. The rays pass through the glass and are absorbed by the metal, heating it to a high temperature and warming the air of the box. The air, which on sunny days rises to 90° F., is conveyed into the room to be heated.

GOPHERS are so numerous in Dakota that they are a great nuisance to farmers. Frequently little animals get in a field and spoil a day's labor of the husbandman by digging up the corn which he has just planted. A South Dakota man has hit upon the expedient of smoking his seed corn, and he says the gophers won't touch it. He puts it in a sack, hangs the sack in the upper part of a barrel, then builds a smudge in the barrel and smokes it just as he would a ham.

OIL OF LAVENDER WILL KILL MOTHS.—Oil of cedar may kill moths, in fact one would think that it must kill them, for it makes any human creature who smells it long to die; but if, as it is asserted, oil of lavender will do the same thing, why not use it? Lavender always smells fresh and clean, while a closet in which oil of cedar has been used is only one shade less intolerable than one which has been drenched with benzine.—*Boston Transcript.*

TO EXPEL MOSQUITOES, the *Scientific American* advises, take of gum camphor a piece about one-third the size of a hen's egg and evaporate it by placing it in a tin vessel and holding it over a lamp, taking care that it does not ignite. The smoke will soon fill the room and expel the mosquitoes, and they will not return even though the windows should be left open all night.

TWIN CHICKENS.—A curious feature in ornithology is reported from Eskington, Yorkshire, England, where a hen has hatched two chickens from one egg, both chickens being in a perfect state, except that they are joined together on one side of the membranes of the wing. Beyond this, they walk about and feed in the usual manner.

NEW ARTIFICIAL FUEL.—An Indiana man grinds cornstalks and coarse prairie grass, moistens them with water, reduces them to a coarse pulp, and then subjects the mass to heavy pressure, compressing them into blocks 12x4 and 4 inches thick. These, when thoroughly dry, furnish more heat than ordinary bituminous coal.

A YOUNG BRICKLAYER.—Down in North Carolina an eleven-year-old son of the boss brick mason is earning his $2.50 a day. He is at work on the outside of the wall where none but experts handle the trowel.

THERE are more paper-mills, running more machines, in the United States than in any other country in the world. Germany has nearly as many, but no other country has half as many.

ELECTRICITY.

Arc vs. Incandescent Illumination.

A dispatch from Galena, Ill., reports that "after four months' trial, the incandescent electric-light system, introduced here for illuminating the streets and public buildings, was rejected by the City Council." The alleged cause is "the inferiority of the light." It seems to be quite well understood among electricians that the arc light is the best yet discovered for illuminating purposes, and is properly receiving a general investigation as to its merits.

In this connection the question has been raised, "In what manner and to what extent the size of the carbon affects the results in a current of given strength, covering, of course, in the general question of conductivity, the all-important results of light and life." This question is thus specifically answered in a thesis by Louis B. Marks of Cornell University, as reported in the *Electrical World* of July 6th:

"The conclusion has been drawn from a multitude of experiments that with carbons of the same manufacture and type the life of the carbon varies directly with its diameter and inversely with its resistance. Thus, the life of a one-inch Brush carbon having an actual diameter of .986 inches and a resistance of .061 ohm is, according to test, 26.15 hours. According to the law above stated, the life of a five-eighths inch Brush carbon having an actual diameter of .618 inch and a resistance of .0735 ohm would be by calculation 13.62 hours. When put to test, this carbon burned 13 64 hours. Many other examples might be given here, but lack of space prevents. In the law stated above it is understood that the relation holds true only when the current and the difference of potential between the terminals of the lamp are kept constant in all cases."

This thesis, says the same paper, "embodies the enunciation of an important law connecting the life of the carbon with its sectional area and resistance, and, in addition, brings out the effect on the light-giving efficiency of molded and forced carbons when burned on 'low tension' and 'high tension' arc systems. From the law, as given, it follows that copper-plated carbons, being of lower resistance than the unplated, are longer lived, and this well-known fact is again affirmed by direct experiment."

A NEW IDEA IN ELECTRIC CARS.—A line of electric street cars on an entirely new system is soon to go into operation in Pittsburg. The idea is to propel each car independently without a cable, without a slot rail or any overhead wires, or even a central station and power-house. The vehicle is a combination car, of which the one part is occupied by the passengers and the other by the motive-power. The latter consists as the prime mover of a gas engine, tanks filled with condensed gas and a dynamo. The electric motor, however, will be placed under the second part. The tanks will be filled with a sufficient amount of condensed gas to keep the engine supplied for 15 or 18 hours. The little gas engine in the front part of the car is connected with the dynamo and the dynamo with the motor. Each car will be fitted up in the same manner and run independently. All that is required is a filling of the tank in the morning before the cars start out, and then they will run for the whole day without interruption.

THE SECONDARY BATTERY IN TELEGRAPHY.—The secondary battery, says William Henry Preece, F. R. S., is proving very useful in telegraphy in England. All attempts to use dynamos direct for telegraphic purposes have failed, but their use indirectly, by means of secondary batteries, has been eminently successful. At the General Postoffice in London, there are 220 circuits thus worked from only 38 cells. The currents used for telegraphy are very minute compared to those used for electric lighting; .05 ampere, or 50 millamperes, is a large current for such a purpose. Thus, the current that would light one 50 watt glow lamp will work 10 telegraphic circuits. The secondary cells are applied thus: 20 cells supply motive-power for Delany multiplex distributors and 120 single needle circuits; 18 cells, or two parallels of nine cells, provide currents for 100 direct inker Morse circuits.

ELECTRICAL TRANSMISSION.—A large New Hampshire cotton-mill, near Manchester, is going to adopt the electrical transmission of power. It will be brought from a water-power about one mile from the mill. This mode of transmission is being extensively used in this city and State. A large company was recently incorporated in this city for furnishing such power through the medium of dynamos, which they are prepared to furnish of any amount of power from one-horse or less up to hundreds of horse-power.

IT IS STATED that lightning has already been known to strike overhead electric-light wires and discharge itself through the dynamo to earth, to the imminent danger of the machine.

CAPTAIN BELL of the steamer A. B. Field recently reported at Astoria that he had found a cod bank about eight miles from Nestucca, which is near the promontory of Cape Lookout, on the Oregon coast, 60 miles south of the Columbia river. The cod were found in great numbers, were large and of excellent quality,

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SAN FRANCISCO
Saturday, July 27, 1889.

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[NEW THIS ISSUE.]

Rock Breaker Wanted—Paymaster M. Co., Yuma, A. T.

☞ *See Advertising Columns.*

Passing Events.

The Mining Stock Association is protesting against the system of ore milling on the Comstock, where so small a percentage of assay value is returned on ore milled. It is about time this matter was vigorously attended to, for there is little doubt that stockholders do not get the returns they should.

It seems that, in addition to the leaching works, Col. Ranlett will shortly put up smelting works at the Newton Copper mines in this State. He has lately been investigating this subject thoroughly.

The Lick Observatory will send an expedition to South America to observe the eclipse of Dec. 21, 1889.

The fact that the superintendent of the Oakland Electric Light and Motor Co., this week, through accident, sustained an electric shock, far beyond that before considered possible, and yet recovered, will still further increase the interest in the subject of executions by electricity.

THE American workingmen's expedition, under the auspices of the Scripps League, started for Europe this week. When it was announced that the British Government would send 100 British workmen to the Paris Exposition, it was hoped that Congress would do likewise, but it did not. Thereupon the newspaper men took up the scheme and soon arrangements were completed for sending 50 workingmen to Europe.

Silver's Influence on American Wheat.

Before entering further into the silver question from its intrinsic standpoint as a leading industry in this country and therefore calling for protection, it is best to explain more in detail why England is opposed to its being remonetized.

Great Britain sees in the Indian rupee and the Russian silver rouble the means by which cheap food can be secured for her toilers in the manufacturing centers, and at the same time give employment in its carriage to her merchant marine. In the London *Standard* of May 19, 1888, the following appeared: "India has no longer the commanding position in the wheat trade which her 'monopoly,' it might be called, of a currency depreciating in value gave her. Russia has entered the lists against her, and, thanks to the much greater fall in the exchange value of her paper currency, is now outstripping her. In the first four months of this year the value of Russian wheat imported into the United Kingdom has been 270 per cent more than it was for the same period a year ago. At the same time, the value of our wheat imports from India has declined 76 per cent. Much of this extraordinary turn in the wheat trade is no doubt due to the excellence of last year's Russian harvest, but that merely provided the commodity. It is the fall in the value of the rouble which makes it possible for Russia to beat India this year in the British grain markets." As there are many—far too many for the good of the silver-mining and wheat industry of this country—who do not fully understand the workings of the price of silver on the market values of wheat, we present the following: In 1873, when the United States joined England and Germany in demonetizing silver, the latter sold in the London market at $1.29¼ an ounce fine. The export value of wheat in Calcutta was at that time $1.11 per bushel in our money, or 8s. 7d. sterling in English money. The expense incidental to getting the wheat to Liverpool brought the price to 52s. 1d. per quarter or eight Winchester bushels. It was quoted at about 55s. per quarter in London, and American wheat at 63s. for the better grades. India's export of wheat is given officially at 735,485 bushels for the year 1873. Fifteen years after, or in 1888, the exports of wheat from India were 36,400 260 bushels, valued at 82,827,850 rupees. The export values of the same at the port of shipment averaged $1 11½ per bushel in our money and in English money 8s. 7d. sterling per bushel. But silver having declined from $1.29¼ per ounce fine in 1873 to 92¼ cents in 1888, made the actual cost to the export buyers of the wheat 74 cents a bushel instead of $1.11½ per bushel, as the following illustrates: Silver at par, or $1.29¼, the rupee in England is valued at 2s., but silver at 92¼ cents per ounce fine, the rupee in England is only valued at 1s. 4d. At the latter value, 1s. 4d. per rupee, it only required £5 526 852 to cover 82 827,850 rupees, and as the rupee in India is fully worth 48⅜ cents, and buys its full value in wheat in that country, the profit to England is the difference between 1s. 4d. and 2s., which is 8d., or a little over 16 cents in our money, or a total of $13,779,665. When silver was at par, or $1.29¼ per ounce fine in London, wheat at the port of New York averaged from 1870 to 1875 $1.32 per bushel, and Indian wheat in 1873, at Calcutta, averaged $1.11 per bushel, with silver down to 92¼ cents per ounce fine in London. India's wheat, worth $1.11½ at Calcutta, is paid for in rupees purchasable with gold at 1s. 4d., bringing the cost on a gold basis down to 74 cents, against a silver basis of $1.11½. The decline on a gold basis in Indian wheat caused our export wheat to average in 1888 only about 89 cents per bushel at the port of New York, against an average of over $1 33½ per bushel in 1873, or $1.32 for the five years ending with 1885.

The above is a sad commentary on the insane policy of our so-called statesmen, who virtually make us vassals to England for the benefit of that country first, last and all the time. If our mints were made as free to the coinage of silver as they are to gold, as they were up to 1873, silver would to-day sell at $1.29¼ per ounce fine, as it did from 1792 to 1873, and India's wheat, costing $1.11½ per bushel at Calcutta, would cost in gold, delivered at Liverpool, $1.27½ per bushel, instead of 90 cents per bushel as it now does, with silver 92¼ cents per ounce fine. American wheat at New York, with silver at par, would command all of 41 per cent more than it now does. This advance would go far to enrich our country, raise the mortgages from off American farms, and crown our country with more general prosperity than has been witnessed for several years past.

A Curious Gold Mine.

A Deposit Resulting From Aqueous Action.

The now famous Mount Morgan mine, near Rockhampton, Queensland, was described in the PRESS (with engravings) some years ago, but since that time developments made have given a clearer insight into the mode of deposition of the gold. The deposit presents several interesting features, as may be seen from the following brief description, which embodies the observations of Mr. Jack, the Queensland Government geologist:

The mountain, situated about 30 miles from the sea, is surrounded by a tableland, above which it rises about 400 feet, the summit being 1225 feet, and the average altitude of the tableland about 800 feet above sea level. The country rock consists of a sandstone formation, with occasional masses of hard shale, and in the immediate locality of the mountain it is intersected in every direction with intrusive masses of igneous rocks, such as rhyolite and dolerite. At the time of Mr. Jack's report the geological evidence seemed to prove to him that the mountain has resulted from the upward flow of a thermal spring carrying silicious, argillaceous, and other matter in a semi-liquid, mud-like mass.

The summit of the mountain, when opened out, was found to be a mass of silicious brown hematite ironstone with a stalactite structure, together with what appeared to be a cellular silicious sinter; this had a frothy appearance, and was sometimes light like pumicestone. In one part of the cutting on the summit was found a band of kaolin in various states of purity. Throughout the whole mass gold, exceptionally free from alloy, occurred in the most minute powder, rarely visible to the unaided eye, to the amount of from 5 ounces to 8 ounces to the ton of deposit. It assays 99.7 fine. The alloy is copper, with minute traces of iron, and it is worth £4 4s. 8d. per ounce troy. Quarries lower down the mountain revealed even more complexity in the deposited mass; brown hematite, red hematite, aluminous iron ochre, white silicious deposits, soft aluminite, masses of magnesian and aluminous silicates, and loose silicious sinter, in almost all of which gold occurs similarly and to much the same amount as previously mentioned.

The hillsides formed by the overflow are of like character and carry gold in the same manner as the interior of the hill, but no gold has yet been obtained in the locality which cannot be traced to the influence of the deposit and the surface indications resulting from its gradual denudation. When Mr. Jack examined this mountain for the purpose of reporting on it to the Queensland Government, very little work had been done there. The opinions he then expressed are probably those that any other skilled geologist would form with the same data to judge from. As this great deposit is now well opened out, and much is to be seen which could not have been guessed at when Mr. Jack was there, a different explanation is now feasible to that of the "Thermal" theory then propounded.

In a recently published pamphlet by Florence O'Driscoll, entitled "Notes on the Treatment of Gold Ores," this curious mine is fully described. The author states that recent investigations would justify the classing of the occurrence as a remarkable and unusual development of the following causes as an explanation of the deposits found above decomposing pyritous lodes:

"On certain gold-fields, where the rocks are covered with little or no surface soil, it may be noticed that long lines of brown iron ore (hydrous oxide of iron) cross the field in the direction of the strike of the lodes, sometimes running along the outcrops, in other cases following fissures or cracks on the strike of the rocks containing the lodes; this oxide of iron in many instances may be traced to quartz veins, and is a product of decomposing pyrites."

It seems that this Mount Morgan is the result of aqueous action by which the deposited portions of a large mundic lode beneath have been carried upward and accumulated on the surface. That which appears to be silicious sinter of geyser origin is the silicious skeleton from which granular iron pyrites have been dissolved out by natural causes. Specimens exist where one part of a stone is apparently solid pyrites and the other half sinter. In several instances pieces of the solid parts have been treated with nitric acid and the pyrites dissolved out; then a framework of iron-stained silica was left, not to be distinguished from silicious sinter of thermal origin.

Investigations have revealed the existence of a large pyrites lode underlying the deposit, but this is not yet worked for gold.

Within the last five years gold to the value of several millions sterling has been extracted from the ore taken out of the workings of this mine, and as far as can be judged from these investigations, the mountain throughout is a mass of heavily charged gold-bearing deposit; its value is still undeterminable because of the difficulty experienced in obtaining data as to depth and extent.

Cable-Grip Improvement.

Henry Root of this city has obtained a decree in his favor in the U. S. Circuit Court of the Southern district of New York against the Third Avenue Railroad Company for infringement of patent on a cable grip. This decree includes a permanent injunction restraining the company from using the grip, and also an accounting of the profits of the defendant corporation and the damages suffered by the complainant on account of the infringement. The patent in controversy in this case was the one granted to Wm. Eppelsheimer, March 16, 1875. The specification describes and the drawings show a gripping device provided with two jaws, one fixed and one movable, the lower one of which is caused by suitable mechanism operated from the car to advance toward the other and grip a cable moving upon pulleys between them, and to recede and release the cable. The transverse bar has vertical rope-supporting pulleys, one at each end, so located and arranged that the movable jaw can be raised and lowered between them and carry the cable resting on the pulleys into contact with the fixed jaw when it is raised, and release it when the jaw is lowered so that the cable will rest on the pulleys. The bar is a longitudinal frame to which the pulleys are journaled and held in a fixed relation to the movable jaw.

In the decision Judge Wallace said: "The Hallidie patent is the nearest anticipation of the invention claimed which is shown in the prior state of the art as exhibited by the record. Except as showing devices which perform in combination the function of the combination of the claim, it is of no value. The other patents in the record, which have been adduced by the defendant for the purpose of negativing novelty, do not merit attention. * * * The real question in the case is whether the gripping devices of the defendant, which discharge the same function, are substantially those of the patent."

The judge then goes on and describes the difference between the grip used by the Third avenue road and that claimed by Mr. Root. He said that used by the road was practically the same. "These are merely formal differences. They do not involve any inventive thought and are immaterial as respects the function and mode of operation of the parts of the combination."

Stalactites in Mines.

In the article on the Mount Morgan gold mine, in another column, the statement is made that when the summit of the mountain was opened out a mass of silicious brown hematite ironstone with a stalactite structure was found. One of our correspondents informs us that at the old Ecton copper mine, Staffordshire, England, at a depth of 1000 feet below the surface of the ground, in the gray limestone walls of that pipe vein, caverns were met with sometimes 10 or 12 feet high, with stalactites hanging from the roofs 12 to 18 inches in length. They were semi-transparent, with yellow copper ore in them, having all the appearance of gold. On the floor of the caverns the stalagmites were bedded in beautiful yellow copper ore. The Duke of Devonshire, at great expense, had the contents of one of the caverns taken out and a grotto made of the stalactites and stalagmites at his residence in Derbyshire.

The Rainbow Lode.

Structure of Large and Small Veins.

The Rainbow lode is at Walkerville, about one mile from Butte City, Montana, and was so named by the late J. E. Clayton. It is in Summit Valley district, where millions of dollars in gold have been washed out of the surface gravels below the veins. It is rugged vein gold, no doubt derived from the disintegration of the veins of the district. The lodes were first prominently brought to notice by Mr. Clayton in 1876, and in October of that year the Alice was opened in the central portion of the lode by Marcus Daly. The developments on the Rainbow lode have since been carried on without cessation. Many millions of dollars have been expended and returned, and cities and villages cover the surface which a dozen years ago was in wilderness.

The Rainbow lode was described a couple of years ago by Wm. P. Blake, before the American Institute of Mining Engineers, that vein being a typical example with which he is familiar. We condense from his description a number of facts. On this lode are the Rising Star, Moulton, Alice, Traction, Magna Charta and Valdemere. The country rock is a well-defined gray granite, of even and close grain, with a large proportion of black mica in small crystals, but little quartz, and in some places a little hornblende becoming syenitic. It has no well-defined rift or slaty structure, being apparently eruptive or plutonic in origin, rather than metamorphic. It is much more friable and soft than the rocks of the adjoining range, forming the continental divide.

The conical hill known as "the Butte" has generally been called an outburst of porphyry or trachyte. It is an isolated eminence surrounded by granite. The granite directly west of the Butte is in part hornblendic, and still farther west becomes a coarse aggregate of quartz, feldspar and biotite. At the Magna Charta claim, the dark-colored, hard granite is micaceous and not hornblendic; but some hard outcrops, southwest of the Alice shaft, contain hornblende as well as mica. Small crystals of sphene are common, and minute grains of pyrite are disseminated in the mass of the rock.

Throughout this granitic area there are alternating belts or spaces where the rock appears to weather or decompose faster than in the adjoining portions.

That the granite is extensively traversed by small veins is not only shown at the surface, but on cuttings at the 300-foot level of the Magna Charta. The granite is traversed in every direction by numbers of small quartz veins in nearly straight lines. (See Fig. 1.) They intersect each other and form a network, inclosing blocks of granite from a foot to a yard in diameter. The veins seem to have affected the rock on both sides, though the centers of the blocks are hard, compact, unchanged granite. These narrow veins extend for many feet with an even width, and do not fault or throw each other at the places of intersection. The vertical veins, from one to six inches in thickness, are filled with sulphides, while the highly inclined or horizontal seams are nearly barren. These facts, while interesting to the student of vein formation, have also a practical bearing, being indicative of an extensive fracturing, or, at least, a deep-seated mineralization of the granite.

The lode, taken as a whole, may be described as a compound one, being in some places divided up into two, three, or more contiguous portions, separated by granitic rock in large lenticular bodies, or "horses." The ore masses in the body of the lode are lenticular in form and lie side by side. Where one thins down, another increases in thickness and takes its place, or is replaced by one of the granitic horses. Some portions of the vein mass are thoroughly crushed and broken up; as completely so as if they had been passed through a crusher, while the fragments are partially rounded by attrition one upon the other.

Prof. Blake, in his paper, gives several illustrations of the structure and thickness of the vein at different levels. Fig. 2 shows a cross-section of the Alice at the 700-foot level, where the lode shows a large amount of softening and alteration of the granite on the footwall side. There is also some softening and change in the hanging-wall, as shown by the section across the vein at this level, representing an aggregate thickness of 40 feet of vein. In this drawing 1 represents the granite country; 2, softened granite with small veins; 3, clay wall with decomposed granite; 4, quartz, broken and seamed; 5, clay and decomposed granite; 6, quartz and manganese spar—the "curly ore;" 7, quartz and ore—"hard vein;" 8, soft granite with veinlets; 9, dark-colored, hard granite of the hanging-wall country.

In the Magna Charta and other claims the developments show greater subdivisions of the lode, these parallel veins being indicated, separated by granitic masses. The relative position and the thickness of these veins are best shown by a sketch cross-section (Fig. 3) made by Prof. Maynard and Prof. Blake in 1881, showing the distances and thicknesses, approximately. The general nature of the ore of the vein may technically be divided into two chief classes; the oxidized and free-milling, and the pyritic or sulphurous, which requires artificial oxidation or roasting.

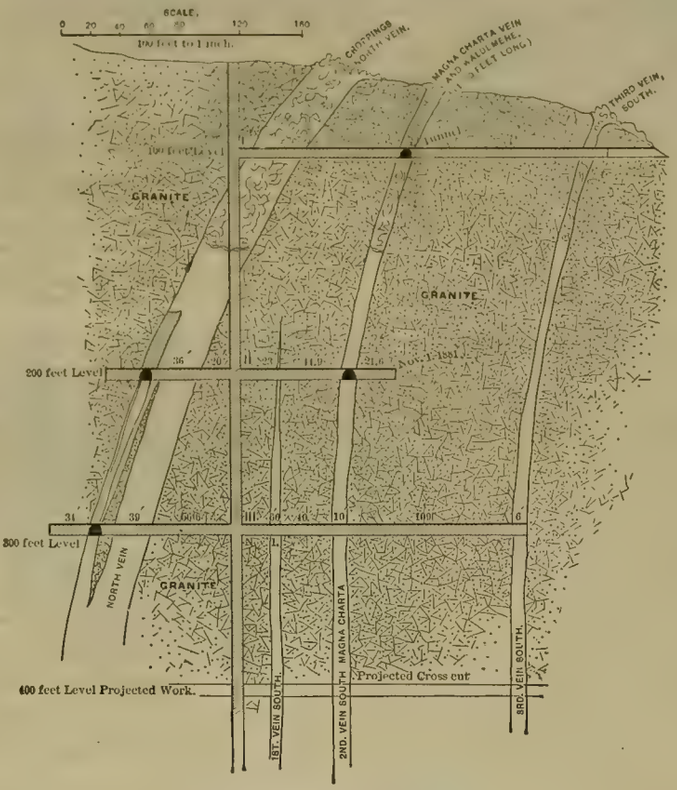


Fig. 3.—Cross-Section of the Magna Charta Mine.

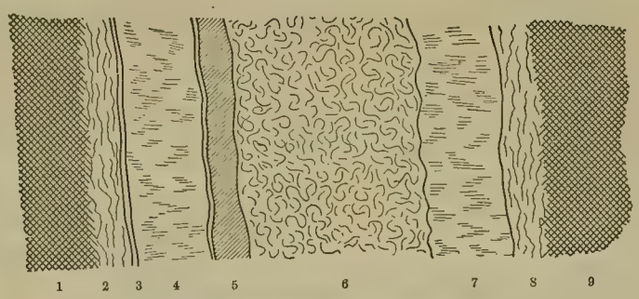


Fig. 2.—Cross-Section of the Lode at the 700-foot Level.

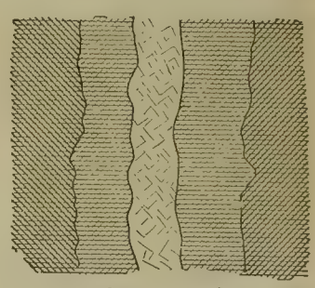


Fig. 5.—Veinlet of Manganese Spar, Bordered by Decomposed Granite.



Fig. 1.—Granite Traversed by Small Veins.



Fig. 4.—Section of a Small Vein.

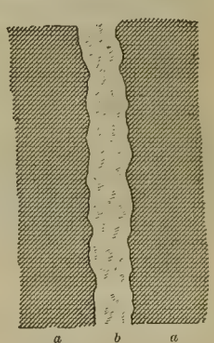


Fig. 6.—Veinlet of Quartz with Ore in Granite.

Pink manganese spar—the species known as rhodochrosite—is the most characteristic mineral of the vein-stone of the lode. It occurs in large quantity in the massive form, and occasionally in good rhombohedral crystals in vugs or cavities.

It is generally much intermingled with quartz, which spreads through the substance of the spar to such an extent as to partly disguise it. Quartz penetrates it also in the form of very thin ramifying veinlets, binding the mass into a very compact hard vein-stone, through which the sulphides are disseminated in minute isolated grooves or in granular aggregations, sometimes forming large bunches of ore. The distribution is usually in sheets or layers, approximately parallel with the walls of the vein. A drawing (Fig. 4) from the edge of one of the side veins or "feeders" of the main lode will illustrate this and show also the general structure of the vein, namely, quartz formed next to the wall-rocks with a central filling of spar and ore.

Gold is also an important element in the ore. It adds considerably to the value of the bullion, and justifies naming the ore a gold as well as a silver ore.

In speaking of the structure of the vein, Prof. Blake says: Manganese spar is sometimes seen in veinlets without a border of quartz. An example was noted on the 1000-foot level of the Alice on a small vein, as shown in Fig. 5. In this, *a* is the granite country; *b*, decomposed granite, and *c* spar. The manganese spar in the center was about one-quarter of an inch thick, and was separated from the hard granite country rock by a selvage or border on each side of decomposed granite one-half to three-quarters of an inch wide.

Another veinlet, on the same level, shown in Fig. 6 (*a*, granite; *b*, quartz) consists chiefly of quartz about three-eighths of an inch thick in the firm granite, with a small quantity of pyritic ore in small grains parallel with the walls.

Such small veins are numerous in the granite near the lode. The structure of these small veins may be considered as a sort of index or key to the structure of the larger ones. It is easy to see that even a very small vein, formed, perhaps, along the plane of the peak or slip in the solid rock, would make a permanent plane of weakness upon which movements of the rocks would take place, and thus tend to increase the size of the vein, and to crush and brecciate the contents and produce clay selvages between the opposite-moving surfaces, whether between the vein filling and the walls or in the midst of the vein, as we find in the Rainbow lode, and in others.

The general type of structure of the lode may be said to be quartz, with a central filling of manganese spar and ore. The alteration o

GEOLOGICAL FEATURES OF THE RAINBOW LODE, MONTANA.

the adjoining granite is interesting and significant. The phenomena favor the view of the origin of the vein and ore from lateral secretion, or rather from the slow flowing of the water contained in the mass of the rock toward a seam, fissure or crack along which the solutions could flow with less resistance than in the capillary pores of the rock. It would seem that the quartz of the veins is derived from the adjoining granite, for we find most of the quartz removed, and even the silicates decomposed, with a loss of at least a part of their silica.

Percentage on Ore Milling.

At the annual meeting of the Savage Mining Co. a protest was entered by certain stockholders against the system of milling the ores from the mine, on the ground that less than 35 per cent of the assay value of the ores is returned to stockholders. It is no wonder that a protest is made, this being the case. The protest is of some interest to owners of stock in mining companies, as it quotes the law on important points that are often ignored by directors, and of which numbers of stockholders are totally ignorant. We append the document in full:

To the President, Secretary and Directors of the Savage Mining Company—GENTLEMEN:—The undersigned stockholders whose stock is represented herewith, most emphatically protest against the ratification of and the continuance of the present system of milling ores for this company on the following grounds, namely: Less than thirty-five per cent (35%) of the assay value of the ores of the mine are returned to the stockholders under the present system, while in years past, and when milling was much more expensive, mill-owners were required by written contract to return not less than sixty-five per cent (65%) of the assay value of ores at the mine to its stockholders. [See contract between Governor Stevenson of Nevada and the Kentuck Mining Company, extending from 1881 to 1888, inclusive, and others of similar nature with other mines.]

And we, stockholders, further protest against the manner in which the superintendent's weekly and monthly statements are made, and demand that the assay value of ores at the mine, as well as at the mill, shall be given under oath, and filed where stockholders can see it, and in accordance with the Act of April 23, 1880. Sec. 1st reads: "It shall also be the duty of the superintendent to file with the secretary a weekly statement, under oath, showing the number of men employed under him and for what purpose, and the rate of wages paid to each one. He shall attach to such account a full and complete report, under oath, of the work done in said mine, the amount of ore extracted, from what part of the mine taken, the amount sent to mill for reduction, its assay value, the amount of bullion received, the amount of bullion shipped to the office of the company, or elsewhere, and the amount, if any, retained by the superintendent. It shall also be his duty to forward to the office of the company a full report, under oath, of all discoveries of ores or mineral-bearing quartz made in said mine, whether by boring, drifting, sinking, or otherwise, together with the assay value thereof; all accounts, reports, and correspondence from the superintendent shall be kept in some conspicuous place in the office of said company, and be open to the inspection of all stockholders."

And, hereafter, that all contracts to mill ores shall be made in writing, and the mill-owners be required to return at least seventy per cent (70%) of the assay value of ores at the mine, in place of such inadequate returns as are now made, based upon the pulp assays at the mills, and in which system of making said pulp assays the stockholders have no one to represent them, thus leaving the mill-owners to do as they please without protest or objection.

From the superintendent's letters for 1888, the only source of information open to stockholders whereby they can get data on milling, we obtain the following:

CAR SAMPLES.		BATTERY ASSAYS.	
June	$ 33 00	June average	$22 00
August	30 00	July "	20 24
September	28 00		
October 15th	50 00	November average	$19 75
November 5th	45 00	December "	18 47
Total	$186 00	Total	$80 46
Average	37 20	Average	20 11

65% of $20.11=$13.07, being the amount per ton returned by the Rock Point mill to the stockholders, or less than 35% of $37.20, the car sample assays.

And we further demand that the Board of Directors of the Savage Mining Company take immediate action, whether legal or otherwise, to recover the balance of the bullion, or the money value thereof, now in the hands of and illegally held by the mill-owner, party or parties who milled the ores.

Refusal or delay to comply with this demand will compel the undersigned stockholders to demand an accounting on behalf of the company. All of which is respectfully submitted on behalf of the Mining Stock Association.

W. N. GRISWOLD,
THEO. FOX et al.,
Committee.

The Northern Counties of California.

[NUMBER 7.]

Origin of the Submerged River-Bed at Gold Bluff.

[Written for the PRESS by JAMES H. CROSSMAN.]

The following paragraph is from Prof. Whitney's "Metallic Wealth of the United States," page 82. The segregation and concentration of gold in its matrix from the surrounding rocks is not confined to any geological age or period. It is due to metamorphic action, particularly when in the vicinity of igneous rocks.

Prof. Joseph Le Conte, in his "Elements of Geology" (a comparatively recent work from which I have made copious extracts with some modifications and changes to suit my views), graphically describes the age, origin and deposition of gold as follows: First, in its quartzose matrix; second, subsequent degradation of the rocky structure by glacial action and the erosive power of water; third, its redeposition with the alluviums filling the troughs of the ancient river channels.

Modes of Occurrence of Gold.

"Gold is found in infinitesimally small quantities in all rocks—granites, traps, slates. * * *

"Chemical and electrical agencies first dissolve and segregate it, redepositing it in previously or contemporaneously filled fissures in the earth's crust, generally in a silicious matrix (quartz) with metallic sulphides. In the Appalachian chain, in the Ural mountains, and in Australia, the slates or schists are metamorphic silurian; in California, in Jura Trias, through all geological times there has been a gradual concentration of this metal."

Sir Charles Lyell, Sir R. Murchison and other distinguished geologists state that up to a comparatively recent period a universally high temperature prevailed from the equator to the Polar circle; that the mammoth mammalian species abound, the Mastodon, Elephas Primegenus and the carnivora of that age, and in all probability primeval man then existed and roamed these happy hunting-grounds; that by some cataclysm of events, possibly the near approach of a comet or from some other cause, the temperature suddenly fell, destroying at one swoop all animated life (a besom of destruction). With a sudden change of climate, the glacial period in the Quatenary era followed, covering the North American continent with a mantle of ice of from 3000 to 6000 feet in thickness, and the whole continent was bodily elevated from 1000 to 2000 feet above its present bed or condition. An arctic region prevailed; glaciers from the polar ice cap advanced southward as far as the Gulf of California, forming immense rivers of ice. The glacial flow as it wended its way southerly and westerly from its immensity of weight, plowed ground and cut through the underlying rocky formation that constituted its bed, scoring deep grooves, channels and gorges in its course, and heaping the accumulated debris in moraines and immense beds as it subsequently receded. At the end of this period the scene changed; a new epoch was inaugurated in the history of the world. "The Champlain" appears with a downward movement or subsidence in the earth's crust or land surface which continued until the vantage-ground was lost—forming a depression of from one to two thousand feet below the present level, crushing and crumbling its rocky structure, resulting in a period of great volcanic activity. Volcanoes and fissures were formed, from which poured forth immense floods of molten material, water and gases, covering the whole slope of the North American continent. The consequent heat rapidly melted this immense blanket of ice and a resultant torrential flow of water followed, coursing seaward through the previously glacial-formed troughs, eroding and cutting still deeper channels, smoothing and rounding the angular fragments of the glacial moraines.

This Flood of Waters

Necessarily formed immense rivers laden with auriferous diluvium—two powerful agencies of disintegration and destruction—the glaciers with an irresistible power grinding and breaking, while the aqueous fluid crushed, sized and concentrated the heavier material and crystalline rocks, which with their metallic contents, gold, platinum, osmi-iridium, titaniferous iron, etc., from their greater specific gravity assimilated and remained in strata or sought the lowest possible levels near the channel's bedrock, while much of the lighter material flowed on and was discharged in the ocean's bed.

This is the history and origin of the immense river that once flowed through this region and discharged into the Pacific ocean at Gold Bluff. The superincumbent

Alluvial Strata

That lies above the level of the ocean, reaching at one point a hight of 936 feet, have been proved by actual workings on a large scale, not only by nature's hydraulic wave-power attacking the gravelly banks of the bluffs as here, but by man's (in comparison) puny invention the "Little Giant," to contain sufficient gold to be largely remunerative when systematically worked by the modern hydraulic process. It is a well-understood fact with the hydraulic operator in the dead-river channels of our middle counties that where the top gravel pays the expenses of its removal by the hydraulic process, the underlying stratum as it approaches the bedrock, rapidly increases in value, and on the bedrock proper nuggets and big chunks abound. That this rich stratum lies below the ocean-level, is no bar to its being successfully worked by shafts and the drifting process. The numerous banks and strata of pipe-clay that lie between these gravelly beds form an impervious waterproof sheet. In Wales, tin mines have been safely worked for more than a mile under the ocean-bed, and so near the surface that the beating, roar, and dash of the waves could be distinctly heard by the miners.

Mining Personals.

John Hughes of Mohave, A. T., has made a very good strike south of Stockton, in that Territory.

Supt. Donnelly of the Eureka Consolidated mine, Eureka district, Nev., is on a visit to San Francisco.

Jacob Abeel, formerly of Dutch Flat, is superintendent of a group of quartz mines at Idaho Springs, Colorado.

Duncan Falconer, foreman of the Wenban mines at Cortez, has been attending court in Eureka, Nev., as a witness.

It is reported in Eureka that Geo. W. Cassidy has been tendered the superintendency of the Eureka Con. Mining Co.

Mayor Doppenheimer of Vancouver has issued a pamphlet describing the mineral resources of British Columbia.

Col. Horace D. Ranlett has just returned from the East. While absent he visited the copper mining districts in Montana.

Frank Satterlee of the Iron Mountain will, it is said, hereafter superintend the Central mine, Old Diggings district, Shasta county.

George M. Pinney of New York has recently been visiting the Young America mine to the north of Sierra Buttes, Sierra county.

Jackson McCracken, the discoverer of the famous McCracken mine, Mohave county, A. T., is now living at Wrights, in this State.

Ex-District Attorney W. D. Long has made a very thorough argument before the Nevada county supervisors on the subject of taxation of mines.

Ross E. Browne, the mining engineer, has lately been making a thorough examination of the artesian-well system in portions of Alameda county.

Henry Horstmayer, an old miner of Canyon City, Trinity county, was found dead in his cabin last week. He was unmarried and had no relations in this country.

W. W. Anderson, formerly superintendent of the Orion hydraulic mine at Iowa Hill, is now manager of the Chooo Hydraulic Mining Co. in the United States of Colombia.

Mr. C. H. Aaron, author of "Testing and Working Silver Ores," "Leaching Gold and Silver Ores," "Assaying," etc., will leave for the mining regions of Honduras in a few days.

A. W. Thurman and F. W. Sperr of Columbus, O., have gone home after examining their mines at Mineral Park, A. T. They intend developing other mines in connection with the Keystone.

N. A. Harris, who was for some time manager of the Big Bend Tunnel Co., Butte county, is now superintendent of the Golden Gate river-bed claim on Feather river, three miles above Oroville.

Aug. J. Bowie, the well-known mining engineer and author of "Hydraulic Mining in California," has of late turned his attention to electrical engineering, and recently returned here from a visit to New York.

Francisco Escobra, a recent graduate of Columbia College, N. Y., has been visiting Nevada county. He is studying up gravel mining, intending to apply his experience at his home in the United States of Colombia.

W. G. Lamb, who has become an expert in operating the Russell process, has gone to Mineral City, Idaho, to start up a Russell leacher for J. W. Young, who had a test made on his ore at Park City, Utah, last April.

August Werner has come from Leadville, Colorado, to Pioche, Nev., to assume charge of the erection and working of the smelting furnace about to be put up at the reduction works there. Mr. Werner, for six years past, has had charge of extensive smelting works at Leadville.

Joe McClane, who died while on a prospecting trip in San Diego county last week, was for many years foreman of the Northern Belle mine, at Candelaria, Nev. Several days prior to his death he had been bitten by a rattlesnake, and drank quantities of whisky to counteract the effects of the poison.

E. D. Boyle, H. M. Gorham, D. B. Lyman, and W. E. Sharon acted as the committee of Comstock mine superintendents to draw up resolutions to protest against the diversion of the waters of the Carson river from its channel during the dry season. It is stated that the farmers have been taking too much water, to the detriment of the mining interests.

Edward B. Campbell, who died at the residence of his brother in Oakland on Sunday, came to California in 1849, and was one of the first men at the famous Rich Bar in Plumas county. In war times he was a member of the famous California Hundred who took part in the Rebellion. He has mined all over the State, and was one of the most prominent prospectors on the coast. His last work was at Collins Camp, Arizona, from which place his brother brought him to Oakland, so he could be better cared for during his illness. Death was caused by pneumonia.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific States.

From the official report of U. S. Patents in DEWEY & CO.'s Patent Office Library, 220 Market St., S. F.

FOR WEEK ENDING JULY 16, 1889.

407,049.—REST FOR BUGGY TOPS—H. H. Allen, Oceanside, Cal.

406,992.—PIPE BENDER—E. L. Burgoin, Los Angeles, Cal.

407,171.—CABLE RAILWAY BRAKE — Oliver Cope, S. F.

407,194.—ROLLERS FOR JUTE MACHINE—H. P. Garland, S. F.

406,909.—SQUIRREL-POISONING MACHINE—W. J. Howard, Mariposa, Cal.

407,080.—LAST—A. M. Leighton, Port Townsend, W. T.

407,081.—LAST—A. M. Leighton, Port Townsend, W. T.

406,925.—FENCE—J. T. Mayhew, Vista, Cal.

407,112.—FILTER—Parmenter & Blackman, Oakland, Cal.

406,966.—MAIL-BAG RACK, ETC.—S. Strange, Los Angeles, Cal.

407,044.—HYDRAULIC DREDGER—J. H. Von Schmidt, S. F.

406,979.—SEWER-GAS TRAP—W. Wallace, S. F.

407,144.—RULER—W. J. Wright, S. F.

The following brief list by telegraph, for July 25th, will appear more complete on receipt of mail advices:

California—George H. Wright, San Francisco, signals for crossings of cable railways; Asa Wells, San Francisco, hoop clamp; Leon P. Garain, assignee of one-half to J. Lafferty, San Francisco, machine for forming bulkets.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CABLE RAILWAY BRAKE.—Oliver Cope, S. F., assignor of one-third to James Otis. No. 407,171. Dated July 16, 1889. This consists of the combination with the car or dummy of a gripping mechanism traveling above and below the slot-irons of the cable tube or tunnel—a mechanism whereby the jaws of the grip may be made to approach each other and clasp the jaws of the slot-irons, or recede from each other so as to release them. It also consists of a mechanism for disengaging the grip-brake at will and a means for detaching and swinging the brake up clear of the slot-irons and the track. It also consists of a horizontal shaft extending across the car-frame, carrying mechanism whereby this grip-brake is operated, as well as eccentrics by which the track-brakes are operated simultaneously therewith.

RULER.—William J. Wright, S. F. No. 407,144. Dated July 16, 1889. This ruler has its upper back surface formed with a longitudinal groove, serving as a finger-hold, and its lower surface or base is formed with a groove, leaving narrow bearing edges, on which the ruler rests, and a round ruling surface on its front, projecting over its base. The object is to provide a ruler having the stability of a flat or angular ruler, its ruling edge possessing the advantage of a round one, the said ruler being readily movable, and with cleanliness, and being easily and accurately held in place without having the holding-hand interfere with the pen.

FILTER.—Chas. H. Parmenter and Geo. V. Blackman, Oakland. No. 407,112. Dated July 16, 1889. The invention consists in a bolt having grooves or channels in its sides and provided with encircling independent disks of cloth or other filtering fabric which are pressed tightly together upon the bolt. The invention further consists in the arrangement and combination of the grooved or channeled filter-bolt with the outer casing and faucets used, and, when required, with a novel purifier.

Ditches Over Agricultural Lands.

EDITORS PRESS:—Will you please state in the PRESS what the laws of this State are at the present time in regard to the right of a mining company to convey water by means of ditch or pipe over or across agricultural lands where the owner of the land objects. There is said to have been a bill passed allowing the right of mining and manufacturing companies to cross over or through agricultural or other lands upon the payment of actual damages incurred. Is this the fact? E. H. SCHAEFFLE.

Mr. Roger Johnson, attorney in this city, whose practice makes him an authority on such matters, says that there is no law giving the right to any individual, mining or manufacturing company, to convey water by means of ditch or pipes across or through agricultural or other lands not belonging to the Government upon the payment of actual damages incurred. He says the courts have decided that no one has a right to construct a ditch through another's inclosure without his consent. He cites 10 California, page 104; 15 California, page 137; 42 California, page 339; and 45 California, page 482.

Mount Greyback.

Professor Davidson has just returned from a reconnaisance trip to the mountains of the San Bernardino range. His principal object was to get the view from the summit of Greyback, situated in San Bernardino county, which is 11,500 feet above the ocean. The greater part of the ascent was made on the hurricane deck of the burro, but the last 1500 feet was done on foot up a slope of 28 degrees, over loose granite bowlders and along the edge of deep snow-drifts. From the summit the view is probably the broadest and grandest in this State because the mountain-mass is almost isolated. To the southeast lies the Coahuila valley, and beyond it the great Colorado desert. Over this low country the mountains of Arizona are visible. To the north and westward is seen the peak of Mount Whitney, distant 180 miles, with the intervening desert of the Mojave. Toward the west are the San Gabriel and Santa Monica ranges, while just to the southward of these ranges lie the broad plains of Los Angeles, San Bernardino and Redlands. The atmosphere was too hazy to see the ocean, nevertheless it is clearly in view in clear weather. The peaks of San Jacinto and Santiago lie to the southward, and in the far distance were seen the mountains on the border of Mexico.

The professor considers this peak the controlling point for the development of the main triangulation of the Coast and Geodetic Survey. He examined all the valleys of this mountain range and traveled more than 100 miles on burros, ascending in all more than 19,000 feet. He visited San Bernardino, Colton, Redlands and Riverside. The latter place impressed him particularly by the wonderful exhibit of miles and miles of orange and oak groves, the beautiful homes and the systematic manner in which water is carried and applied. Here is the fullest exposition of the aphorism of the United States Commissioners of Irrigation in 1873 that water is the life-blood of California. Where the land receives no water for irrigation it is arid and worthless. The line is marked by a fence and by a road. The net yield of the orange lands of Riverside is three to four hundred dollars per acre; the arid lands are worthless. The last year's crop of Riverside oranges yielded $1,200,000, which represents $200 to every man, woman and child in the place.

Professor Davidson found the temperature very warm. Through part of Tulare valley early in the month the thermometer registered as high as 115° in the shade, and he never saw the reading below 90°; but the air was so clear and so invigorating that his daily labor seemed only as a stimulus to more work. He is very enthusiastic over the prospects of the part of the country he traversed. He says there are a million acres visible from Greyback susceptible for the cultivation of the semi-tropical fruits, could they be properly irrigated.

The Hopkins Academy, Oakland, Cal.

In a city of exceptionally fine schooling advantages, the Hopkins Academy of Oakland holds an eminent place. Its history, extending over a period of nearly 20 years, has been one of never-ceasing effort to fulfill the high purpose of its founders in establishing a school that should rank with the best of like educational institutions in the East. In pursuit of this ideal, its promoters have availed themselves of approved modern systems of study, keeping in full step with the progress and spirit of the times. The studies have been carefully arranged and classified with a view to thoroughly fitting the student for entering upon a university course, or to successfully battle with the world in a business career. Due attention is given to physical training, in the gymnasium, under an able instructor, and the best influences of a refined home are constantly brought to bear upon the moral natures of the pupils. The location of the building and grounds is desirable in the highest degree, situated as they are upon an elevation overlooking the city of Oakland and the bay of San Francisco. The cut accompanying the business notice to be seen in another column conveys but a faint idea of the handsome building and elegant surroundings of the Hopkins Academy.

The faculty is composed of W. W. Anderson, A. M., Principal, Latin and Greek; Col. Geo. C. Edwards, Ph. B. (Assistant Professor Mathematics, State University), Senior Mathematics, assisted by Chas. H. Clarke, A. B., C. E. Dascomb, A. B., Miss Frankie E. Anderson, Miss Mollie E. Conners, Otto Fleissner, Miss Ethel Anderson, Howard Mudie, Instructor in Gymnasium.

NEW BRANCH HOUSE AT CHICAGO.—The Lidgerwood Manufacturing Co., 96 Liberty street, New York, have found it necessary, owing to the constantly increasing demand for their celebrated hoisting machinery, to establish a branch house at Chicago, where they can deal directly with their large Western trade. They have just opened such an establishment at 34 and 36 W. Monroe street, that city, where they will carry a large stock of their latest improved machines adapted for all hoisting purposes.

LATE reports from Susanville, in Honey Lake valley, say earthquake shocks continue. One of the shocks threw chimneys to the ground, and a swamp in the vicinity, nearly two and a half miles long, has dried up.

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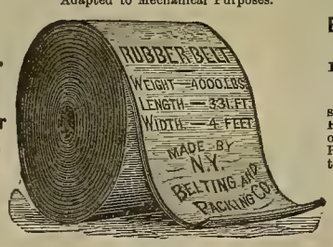
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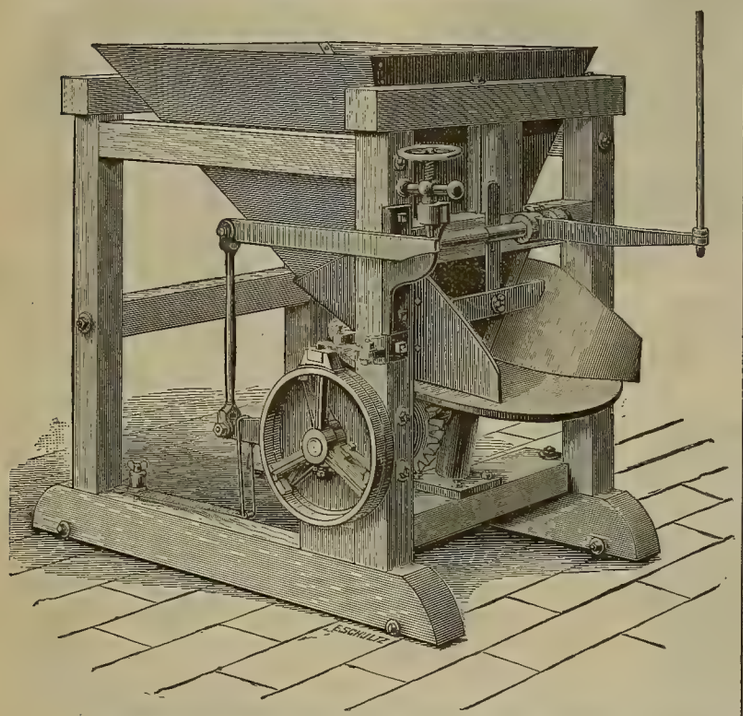
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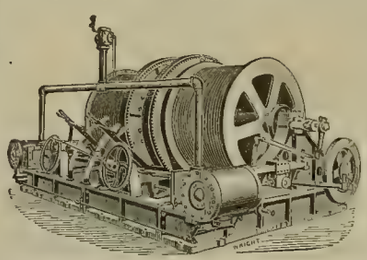
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Smith & Drew took out Tuesday, in their dry wash diggings, in addition to 5 ozs. of fine gold, a nugget weighing 22 ozs. The machine used was Freeman's Dry Process Separator.—*Utah Daily Union, May 10, 1889.*

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THE CALIFORNIA CONSOLIDATED Gold Mining Company, Sierra City, Cal., A. Schubert, President; Alvin Fischer, Secretary; A. Leiler, Superintendent. Divided into 300,000 shares at $1 each. Property comprises two locations. Ore assays $7 per ton, average. Coarse gold, solid rock; vein from 15 inches to 2 feet wide. Tunnel No. 1 in 120 feet, and prospects well. No. 2 just begun. Stockholders: Alvin Fischer, A. Schubert, Gus Fischer, F. L. Fischer, Anton Fischer, Fred Fischer. For information concerning stock, etc., apply to F. L. Fischer, Sierra City.

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Fish Stories.

EDITORS PRESS:—During the first month of our stay in Lake county, we were inclined to pass these by without notice as "ower-true tales." Since there are so many to confirm and none to deny, you can have them as good as new.

The waters of Clear lake abound with carp, catfish, perch, sunfish and silversides. These run up the streams to spawn in such numbers that they tell of fishing with clubs, throwing them out with pitchforks by the wagon-load, etc. One man reported that he killed 84 fish with his horses' feet and buggy while crossing a small stream with a double team. We saw one place where the waters of a creek had dried up and left nearly half enough fish to cover the ground. In another place fat hogs were fishing along the lake shore. Further up the turkey buzzards held full sway, but were so badly behind with their spring's work that fish enough lay along shore in places to touch one another. In the mountain streams they tell of abulous trout springs. F. S. C.

A HEAVY SHOCK.—Thos. A. Edison, the inventor, in his testimony in regard to the death-dealing quality of electricity this week, thought no one would withstand 100 volts. On Wednesday last Wm. Sharpe, superintendent of the Oakland Light & Motor Co., sustained a shock of 600 volts of electricity, and still lives, notwithstanding the statement of Edison. Sharpe was adjusting a wire in the motor circuit, supposing it was not connected with the current, but he was mistaken and he received the full force of 600 volts of a 20-ampere current. The delivery which he received lights two 30-light machines. Sharpe was knocked down and momentarily paralyzed. His heart ceased beating and his eyes became glazed. In falling he relinquished his hold on the wire. The employes thought he was dead, but soon discovered their mistake, and in a short time had him revived.

ECLIPSE EXPEDITION.—Colonel C. F. Crocker has generously offered to bear the expense of an expedition to Cayenne, South America, to observe the total solar eclipse of December 21, 1889. Messrs. Burnham and Schaeberle have been authorized by the Regents of the University of California to proceed on or about November 1,1889, to Cayenne, and establish at some proper point an eclipse station, and to remain there as long as the proper observance of said eclipse and such other work in connection therewith may make it necessary, not later than February 1, 1890. The director of the Lick Observatory is to prepare general plans and directions for the expedition.

THE Pacific Mail steamship City of New York has been taken to the Union Iron Works, where she will shortly be lifted on the great dry-dock and the work of renovating her will be begun. A new set of boilers, on which the iron works have been engaged for several months past, will be put in position and a general overhauling given her. It is intended to provide the vessel with electric lights and all the new improvements known to shipbuilders. The work will occasion the outlay of $120,000, and will be completed in the course of three or four months.

AT the annual meeting of the stockholders of the Savage Mining Company the following officers were elected for the ensuing year: H. M. Levy. A. K. P. Harmon, Morris Hoeflich, Herman Zadig and E. B. Holmes, Trustees. E. B. Holmes was re-elected secretary and R. P. Keating superintendent. The secretary's financial statement showed an indebtedness of $43,868. The mine produced $30,900 in June.

THE directors of the Stockton State Insane Asylum have awarded the contract for boring a deep gas-well to W. C. Fox for $34,750, the well to be 15 inches in diameter at its top, and at its depth of 3400 feet to be not less than eight inches.

COLONEL HORACE D. RANLETT says that works for smelting process are to be erected at Copperopolis. He also states that the roasting and leaching works are running well and doing excellent service.

THERE are six varieties of salmon in Puget sound: Tyre, Flathead, Silver, Winter, Hoodoo and Chinook. The first-named is the best and the Chinook is the poorest in quality.

THE Calaveras *Prospect* of last week gives a list of the men that have been killed in the Sheep Ranch mine during the last 20 years. It had eight names.

MONTANA mines paid in dividends from January 1st to June 30th the sum of $1,549,250. Of this amount the Granite Mountain paid $1,000,000.

THE city of San Francisco has a total indebtedness of $902,811, while the property of the municipality is estimated at a value of $50,000,000.

A NATURAL GAS WELL has been struck ten miles from Cloverdale, Sonoma county, that flows 4 000,000 feet per day. The gas now goes to waste.

WORK on the new dam in Bear valley, San Bernardino county, will begin on August 10th.

Artesian Water Supply.

(*Continued from page 61.*)

boundaries of the artesian basin of the San Bernardino valley. Upon this he has put down 38 artesian wells, at depths varying from 100 to 500 feet, securing an abundant supply of water. It is brought in by canal and flume. Several large arroyos are crossed by flumes, and there are 16 tunnels on the route. The water enters on the plains of Riverside, nearly 200 feet above the elevation of the canals of the Riverside Water Co. An engraving given herewith gives an idea of the extent and character of the flumes required in a portion of the work. All has been done that the best engineering skill could suggest, and ample means afforded to make the works of the most permanent character.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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R. G. BAILEY—San Francisco.
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A. F. JEWETT—Tulare Co.
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CHAS R. ROOD—Kern Co
WM WILKINSON—San Joaquin Co.
WM. H. COOK—San a Cruz Co.
JULES BAUMANN—Arizona.
CHAS. F. BLACKBURN—Idaho.

STOCKHOLDERS' MEETING.

A Special Called Meeting of the Stockholders of the CALIFORNIA AND NEVADA RAILROAD COMPANY will be held at the office of the Company, 320 California Street, Room 12. San Francisco, California, on SATURDAY, THE THIRD DAY OF AUGUST, 1889, at the hour of 2 o'clock P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Friday, August 2, 1889, at 12 M. E. A PHELPS, Secretary.

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In Gift Map No. 3. on the east side of Shakespeare street, between Hope and Isabel streets, lot No. 1441. Twenty lots, comprising a whole block, on the south side of California avenue, bounded on the other three sides by Bradford, Standish and Mayflower streets, Nos. 1189 to 1209, inclusive.

In Gift Map No. 4, southeast corner of Islais Creek channel and Chace street, 4 lots, Nos. 1969, 1970, 1971 and 1972. Northwest corner of Chace and Freedom streets, 5 lots, Nos. 1955, 1956, 1957, 1958 and 1959. South side of Napoleon street, east from Bigg street, 2 lots, Nos. 2527 and 2528 North side of Tulare street, east from Bigg street, 2 lots, Nos 2543 and 2544.

Also, 2 lots, Nos 82 and 84, Oakland Homestead Association, situated near Lake Merritt and on the easterly road to Piedmont, near the northwesterly limits of East Oakland. They are 50 feet wide by 100 feet deep, with extra land and frontage in one.

The owners themselves offer the above lots to actual purchasers at bedrock prices, and believe that no other property can be bought in the vicinity for immediate use or for investment on nearly as favorable terms.

☞ Apply to or address H. F. D., care of this paper.

Carbon Paint.

We would call the special attention of our readers to the Carbon Paint advertised in our columns. Among the many patents daily brought to our notice, how few have any real practical value? How many that were heralded as with a grand flourish of trumpets have seemed to die still-born, or barely survive the noise of their christening? But in the Carbon Paint we have a patent that has evidently "come to stay." Not only does it appear to have genuine merits, but it is one that successfully meets a great and growing need on this coast. Tens of thousands of dollars are annually expended in trying to protect the roofs of dwellings, factories, warehouses, etc., from decay, and smokestacks, water-pipe, fire-engines, bridges, etc., from the ravages of the elements with paint of doubtful utility, or that furnishes but a brief protection at best, requiring constant renewals at an increased expense. But here is a paint that the universal testimony of those who have used it for five years, as well as many practical tests here, declare it to be peculiarly adapted to a wide range of usefulness. Of remarkable durability, it is at the same time cheap and convenient for use, being neatly put up in cans ready for the brush. It is said to not only resist the action of sea-fog, salt water, coal smoke, etc., but, owing to its rubber-like elasticity it never cracks or blisters under any extremes of temperature, and when properly applied will last good for years. If one-half be true that is claimed for Carbon Paint, and apparently with justice, thousands of dollars might be saved annually in this city by its use on our wharves, water and gas pipes, smoke-stacks, etc., that yield so rapidly to rust or decay if not protected. The company guarantees that Carbon Paint will never rust or corrode any metallic surface. Those who have used this paint in this vicinity on shingle and tin roofs express themselves as greatly pleased. It makes a very handsome roof.

When the value of the C. P. paint as a protection of all kinds of roofs is fully realized the company doubtless will be kept busy in manufacturing the paint fast enough to supply the demand.

We understand that the company do not claim it to be "fire-proof," but as it requires nearly a red heat to ignite it, taken in connection with its cheapness and great durability, Carbon Paint can well challenge competition as a roof paint for general use.

The well-known character of the gentlemen who control the business for the company is a guarantee that a standard article of good paint can always be relied on.

We are always ready and glad to welcome such enterprises in our midst and to wish them God speed. Mr. J. Stratton, the President and Business Manager, is always ready to send circulars or answer any letters of inquiry.—*S. F. Journal of Commerce.*

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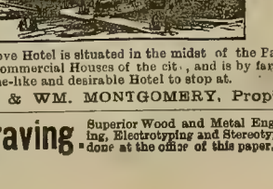
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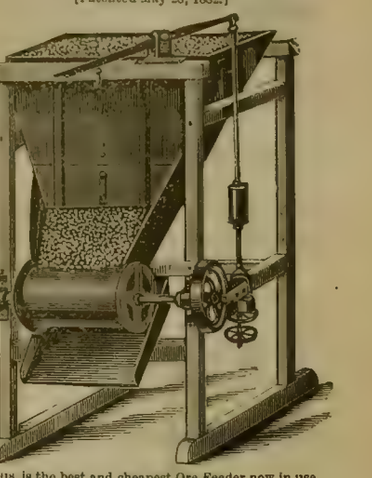
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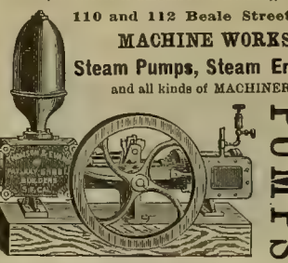
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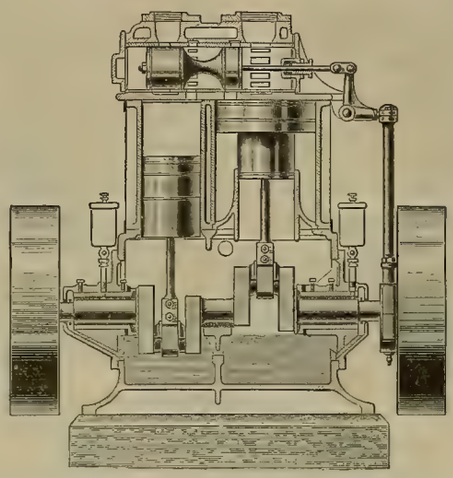
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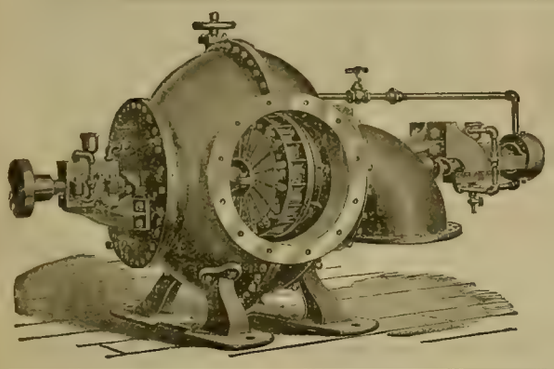
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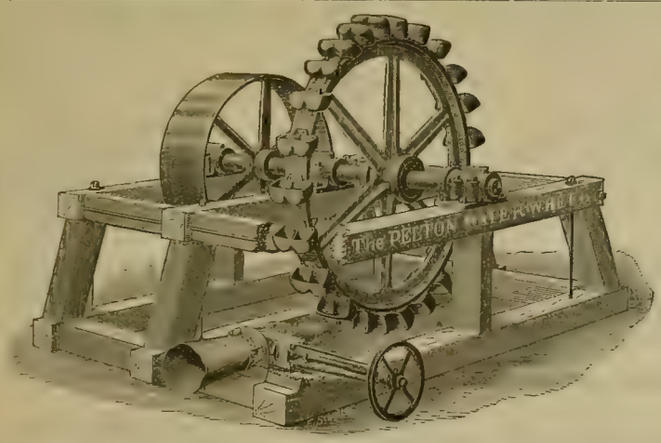
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, July 25, 1889.

General trade the past week was only fair. It is claimed that the volume of goods going out on distributive orders is less than at this time in 1888. The large cereal crops and advancing prices cause merchants to take a hopeful view of the future. The retail trade is reported to be lightly stocked.

In the local market, money still rules easy, notwithstanding light remittances from the interior and a steady increase in the call for funds to move the crops. There is more money going into city realty, but, as a rule, buyers either pay cash or else want small accommodations. The past week there were 55 mortgages recorded, amounting to $125,973. The rate of interest ranged from 6 to 7 per cent per annum. In the speculative markets local securities do not appear to be dealt in to any great extent. The deal in powder stocks, heretofore spoken of, is said to be on, but those who bought in previous deals are not taking a hand now. Having lost once, they do not appear disposed to take a hand again. Wheat futures have been more dealt in. The attractive fluctuations are bringing in more operators. Mining stocks are lifeless. It looks as if the manipulators are trying to wear out outside holders.

The steamer Gaelic, hence July 20th for China, took out the following treasure: To Hongkong, Mexican dollars, 5640.29; gold coin, $16,144; gold dust, $340; silver bullion, $282.000; to Yokohama, Mexican dollars, 50,000; to Hiogo, silver bullion, $100,000; to Calcutta, $16,500. Total, $1,029,013. This is the heaviest shipment made at any one time this year.

The imports of treasure by sea the past week aggregated in coin $11,306.

MEXICAN DOLLARS—The last steamer for China took out 614,029, of which only about one-sixth was sent by Chinese. The price at which the bulk was bought is said to have been 74¾ to 74⅞c for new. The market since the steamer left is quiet, with nominal quotations given at 74¾c for new from first hands.

SILVER—The last steamer leaving for China took out $388,500 in silver bullion, of which $100,000 was for Japan. It is said that the latter country is still in the market for bullion. The delivery of silver bullion to the Carson mint by the Comstock mines has reduced the receipts in this city still less. The shipments by the last steamer cleaned up the market more thoroughly than for some time past. The sales made were at from 92⅛ to a fraction higher. With an advancing market abroad and higher quotations coming through, our market is quotable at 93c an ounce fine. There is more inquiry, but so far as we can learn no sales have been made. It is generally conceded by the better informed that a still higher range in prices will obtain in the near future.

QUICKSILVER—Receipts the past week aggregate 212 flasks. The market is quiet but steady. There was shipped East by rail in the month of June 3874 pounds.

BORAX—Receipts the past week aggregate 625 centals. The overland shipments in June aggregate 2024 centals. There was shipped by sea the past week 1252 centals to New York. The market is firm, with a good consumptive demand reported from the East.

SPELTER—European mail advices report a strong market, with further improvements in prices looked for, owing to a lessened output and a free distributive demand.

LEAD—The market is quiet. Eastern advices indicate a disappointment on the part of dealers in the Treasury not deciding the import duty on Mexican silver ore. The Treasurer seems inclined to the opinion that a decision on the point in controversy should be made only by an Act of Congress.

TIN—The market is quiet, with an easier tendency in both pig and plate. English mail advices report a fluctuating market, with a gradual sinking in values. The output is expected to increase rather than decrease. On July 12th, the prices in London were as follows: Spot, £88 12s 8d; three months future, £89 5s. On July 19th, the closing quotations were: Spot, £88 7s 6d; three months future, £88 17s 6d.

COPPER—The market retains the same uneasy, unsatisfactory feeling heretofore reported, and that, too, in the face of diminishing stocks the world over, under a free consumption. It now looks as if a compromise to form a better pool is as far off as ever. The following are the London comparisons of quotations: July 12th, spot, £41; futures, £40 10s; July 19th, spot, £40 15s; futures, £40.

IRON—The imports of pig the past week were as follows: From Oregon, 17 tons; Irondale, 220 tons. Total, 237 tons. The market, although reported unchanged, has a decidedly strong undertone. The consumption is steadily increasing. The Eastern markets are stronger and quoted at an advance. Manufactured iron at the East is also reported to be doing better. London mail advices state that the advance in America, coupled with reduced stocks of iron in England and Scotland and higher price of fuel and ores, coupled with a good home market, have caused the English markets to strengthen.

The following are the latest comparative quotations f. o. b. at Glasgow:

F. o. b. Glasgow.	July 19,'89.	July 11,'89.	July 18,'88.
No. 1 Coltness	57s 6d	56s	46s 9d
" Langloan	55s	54s	46s 9d
" Summerlee	55s 6d	54s	46s
" Gartsherrie	53s 6d	52s 6d	43s 9d
At Ardrossa.			
No. 1 Englinton	44s 6d	44s	37s 9d
" Glengarnock	53s 6d	52s	42s 9d
" Dalmellington	46s	45s 6d	39s

COKE—The cargo received the past week is being discharged. Some of the large consignees or purchasers are disposed to sell small parcels to other consumers, which has tended to lower prices for spot.

COAL—Imports the past week were as follows: From Tacoma, 5890 tons; Departure Bay, 3400; Namaimo, 833; Seattle, 1758; Coos Bay, 1980. Total, 13,861 tons. The market for spot has been advanced on several grades. This was intimated by us in last week's PRESS. The advance has tended to somewhat check the demand from retail dealers, who, as a rule, look with suspicion on the higher prices asked, particularly with Wallsend steam coal being sold at $6.75 for prompt shipment, and Bulli at $6.50 to $6.62½. Large consumers have taken several cargoes to arrive and for shipment, thus meeting their wants well into January of next year. The coast collieries are turning out the usual quantity, but which will undoubtedly be increased if the market continues to show strength and activity.

The advance in Liverpool steam is due to the C. F. Sargent, one of the three vessels on the way with the coal, putting into port in distress and the fear of the vessel being condemned.

Eastern Metal Markets.

By Telegraph.

NEW YORK, July 24, 1889.—The following are the closing prices the past week:

	Silver in London.	New York.	Copper.	Lead.	Tin.
Thursday	42 1-16	91⅞	$11 90	$3 87½	$19 75
Friday	42⅛	91⅞	11 90	3 90	19 75
Saturday	42⅛	91⅞	11 90	3 90	19 80
Monday	42 3-16	92⅛	11 85	3 87½	19 90
Tuesday	42⅛	92⅛	11 90	3 87½	19 90
Wednesday	42 5-16@42⅜	92⅜	.....	3 87½	.....

NEW YORK, July 24.—The trade in copper is restricted to current wants of customers. Lake and casting brands are heavy. Pig lead is dull, closing mainly at $3.85. Borax is unchanged. Steamer receipts quite supply current wants. Quicksilver is firm and higher; 66@68c; £9, London bid. Considerable activity is shown in whale and sperm oil at New Bedford, but prices are not made public. Tin fluctuates, closing barely steady.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, July 25, 1889.

ANTIMONY—	15 @ 16
Refined	7¼@ 7⅝
Powdered	7¼@ 7⅝
Concentrated	— @ 6¼
COPPER—	
Bolt	21 @ 22
Sheathing	22 @ 24
Ingot, jobbing	15 @ 16
do, wholesale	12 @ 13
Fire Box Sheets	22 @ 24
LEAD—Pig	4½@ 4⅝
Bar	5 @ —
Sheet	7 @ —
Pipe	6 @ —
Shot, discount 10⅞ on 500 bags Drop, ℔ bag	1 45 —
Buck, ℔ bag	1 65 @ —
Chilled, do	1 85 @ —
STEEL—English, lb	16 @ 20
Canton tool	9½@ —
Black Diamond tool	10 @ 16
Pick and Hammer	8 @ 10
Machinery	4 @ 5
Toe Calk	4½@ —
TINPLATE—B. V., steel grade, 14x20, P. S	4 60 @ 4 65
B. V., steel grade, 14x20, spot	4 80 @ 4 90
Charcoal, 14x20	6 25 @ 6 75
do roofing, 14x20	5 12½@ 5 25
Pig tin, spot, ℔ lb	21 @ 21¾
do, do, prompt shipment	— @ —
QUICKSILVER—By the flask	47 50 @ —
Flasks, new	@ —
Flasks, old	37½@ —
COKE—Eng., ton, spot, in blk & sks, respt'vly	17 00 @19 00
Do, do, to load	13 00 @13 25

IRON—Glengarnock ton	Spot. 27 00 @— —	To Load. 27½@ —
Eglinton, ton	26 00 @— —	26½@ —
American Soft, No. 1, ton	— @31 00	31½@ —
Oregon Pig, ton	— @30 00	— @ —
Clay Lane White	— @24 50	25 @ —
Shotts, No. 1	28 50 @29 00	— @ —
Bar Iron (base price) ℔ lb	2¾@ 3	— @ —
Chrome iron ore, ℔ ton	— @10 00	— @ —

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	$ 6 75 @ 7 00	Cardiff	9 50@10 00
Liverpool St'm	7 50 @ 7 75	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	8 00 @ 8 50	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Gilman	6 00
Scotch Splint	9 00	Seattle	6 00
West Hartley	10 00	Coos Bay	5 00
Greta	8 00	Cannel	10 00
Westminster Brymbo	9 00	Egg, hard	17 50
Nanaimo	9 00	Cumberland, in sacks	19 00
Sydney	$ 8 00	do, bulk	18 00

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$19 00	$16 00
41 to 50 ft	20 00	17 00
51 to 60 ft	22 00	19 00
61 to 70 ft	26 00	22 00
1x3, fencing	21 00	18 00
1x4, "	20 00	17 00
1x3, 1x4 and 1x6, odd lengths	18 00	15 00
Second quality	16 00	14 00
Selected	23 00	21 00
Clear, except for flooring	30 00	27 00
Clear for flooring	1 00	.....
Clear V. G. No. 1 flooring	5 00	.....
Firewood	9 00	9 00
Dressed Pine, flooring, No. 1, 1x6	31 00	28 00
No. 1, 1x4	33 00	29 00
No. 1, 1¼x4, 1¼x6, and odd sizes	36 00	32 00
All sizes, No. 2	26 00	23 00
Stepping, No. 1	43 00	34 00
Stepping, No. 2	33 00	24 00
Ship timber and plank, rough	26 00	17 00
Selected, planed 1 side, av'ge 40 ft	28 00	23 00
" " 2 " " " "	30 00	25 00
" " 3 " " " "	32 00	27 00
" " 4 " " " "	34 00	29 00
Deck plank, rough, average 35 ft	34 00	31 00
Dressed, average 35 feet	39 00	34 50
Pickets, rough, B. M	18 00	15 00
¾x1¾, 4 ft long, ℔ M	5 50	4 00

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

MINING SHAREHOLDERS' DIRECTORY.

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ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Argenta M Co	Nevada	19	10	July 20	Aug 21	Sept 16	E M Hale	314 Montgomery St
Alpha Con M Co	Nevada	3	25	July 15	Aug 22	Sept 12	C E Elliott	309 Montgome.y St
Andes M Co	Nevada	35	25	Jun 12	July 18	Aug 8	J J Hawkins	309 Montgomery St
Baltimore M Co	Nevada	5	25	July 2	Aug 5	Aug 24	A R Grim	401 Montgomery St
Baker Divide M Co	California	17	25	July 8	Aug 10	Aug 28	D M Kent	330 Pine St
Best & Belcher M Co	Nevada	43	25	June 6	July 11	Aug 1	L Osborn	309 Montgomery St
Chollar M Co	Nevada	27	50	July 15	Aug 20	Sept 10	C E Elliott	309 Montgomery St
Crocker M Co	Arizona	7	10	Jun 14	July 19	Aug 13	A Waterman	309 Montgomery St
Crown Point M Co	Nevada	51	50	July 9	Aug 12	Sept 2	J Newlands	329 Pine St
East Mt Diablo M Co	California	5	10	July 13	Aug 22	Sept 16	R W Heath	318 Pine St
Eureka Con M Co	Nevada	12	50	Jun 12	July 15	Aug 7	H P Bush	306 Pine St
Frue Con M Co	California	6	1½	June 11	July 18	Aug 10	J C Bates	434 California St
Gray Eagle M Co	California	13	05	May 15	July 2	July 23	O H Bogart	327 Pine St
Golden Fleece G'v'l M Co	California	17	00	May 21	July 20	Sept 16	W J. Gleason	306 Market St
Mexican M Co	Nevada	38	25	July 9	Aug 13	Sept 3	C E Elliott	309 Montgomery St
North Belle Isle M Co	Nevada	15	30	June 17	Aug 1	Aug 22	J W Pew	310 Pine St
Nevada Queen M Co	Nevada	5	50	June 3	July 9	July 30	H Deas	309 Montgomery St
Original Gold Hill M Co	Nevada	12	25	June 17	July 25	Aug 14	A W Barrows	303 California St
Platt & Gilson G M Co	California	1	3 00	June 20	July 22	Aug 7	C Herrman	326 Kearny St
Quartz Mountain M Co	California	21	40	Jun 17	July 22	Aug 15	E Hestres	217 Sansome St
Savage M Co	Nevada	73	50	July 19	Aug 21	Sept 10	E B Holmes	309 Montgomery St
Seg Belcher & Mides Con M Co	Nev	3	25	June 4	July 8	July 29	E B Holmes	309 Montgomery St
Sierra Nevada M Co	Nevada	95	25	June 7	July 31	Aug 21	E L Parker	309 Montgomery St
Utah Con M Co	Nevada	7	25	July 9	Aug 13	Aug 30	A H Fish	309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING	DATE
Benton Con M Co	California	V B Allen	330 Pine St	Annual	July 31
Calavaras Blue Gravel M Co	California	B Burris	240 Montgomery St	Annual	July 29
Cons New York M Co	California	C E Elliott	309 Montgomery St	Annual	Aug 3
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	Annual	Aug 5
Live Oak Drift Gravel M Co	California	J Morizio	328 Montgomery St	Annual	Aug 20
Lady Washington Con M Co	Nevada	L Osborn	309 Montgomery	Annual	July 31
San Joaquin Valley Coal M Co	California	F Bonacina	338 California St	Annual	July 25

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT	PAYABLE
Benton Con M Co	California	V B Allen	330 Pine St	Annual	July 31
Caledonia M C	Nevada	A S Cheminant	328 Montgomery St	08	July 5
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	July 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	July 10
Idaho M Co	California		Grass Valley	7.50	May 5
Navajo M Co	California	J W Pew	310 Pine St	10	Apr 1

Mining Share Market.

The mining stock market the past week has been flat, stale and unprofitable to all classes of dealers. To buy, an advance had to be paid; to sell, low prices had to be accepted. It looks as if the pool is determined to drag the life-blood out of business, and all on the annual summer cry of neither ore nor water, but plenty of deadwork and assessments. There are some outside operators who think that to collect the present assessments levied on several of the Comstocks, with more to follow, the pool will make a small upward move. While believing this they have no confidence in the stability of values until a still lower range of prices obtains. The writer's experience is that if a person knew the ins and outs of a mining-stock market he would find in it a mint to coin money, and he has also learned that one man's judgment, outside of manipulators, is not any better than another's. Stocks are said to be purposely made scarce to keep outsiders from shorting, and that when the time comes to get shorts they will be made as plentiful as autumn leaves. This Thursday morning there was continued light trading, hardly enough done to make quotations. In the outsiders there appears to be a continued effort to infuse life into the Tuscaroras, but so far without any visible effect. It looks, though, as if some of these stocks were being taken in by insiders. The Quijotoas have been lifeless at blackboard bids and asks. Silver King has been quiet at fairly steady quotations, as has Eureka Con. In the Bodies very little has been done, and that little at declining prices. Mono got its long-promised 50-cents assessment, but the price of the stock has not, as yet, got down to the street points, viz., 60 or 50 cents, neither has Bodie gone down to the $1 point, with perhaps its dropping to 90 cents, or even 75 cents. It looks to an outsider as if Borland and Kelly under the election contest report in June last had peddled out considerable of its stock. But time will tell.

From the mines there is nothing of particular interest to report. The work going on in several of the Comstock mines is being closely watched by mining men, with feelings of confidence that new ore bodies may be run into in the course of the next month or two. From the Bodies, Tuscaroras and Quijotoas there is nothing new to report; all advices are of the same character heretofore reported. From the latter district private information to hand states that in the Central mine, near the Indian Chief group of mines, something important is looked for at an early day. As the mine is gold-bearing, any development there will not be met by a discount on the bullion outturn.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

RISING SUN M. Co., July 19. Capital stock, $100,000. Directors—J. Deming, C. A. Stratton, A. F. Collins, A. F. Johns and G. A. Carter.

FULLER & ANDREW CO., July 19. Object, to do a real estate commission business. Capital stock, $10,000. Directors—F. W. Fuller, J. H. Andrew, W. J. Trott, Wm. Andrew and C. B. Dean.

NIAGARA M. & M. Co., July 23. Capital stock, $500,000. Directors—W. C. B. De Fremery, B. C. Cuvellier, J. L. De Fremery, C. S. Wheeler and L. M. Hoefler.

SAN FRANCISCO CON. OIL CO., July 24. Capital stock, $1,000,000. Directors—W. Fern, W. S. Bell, H. L. Garfield, T. E. Atkinson and H. K. McJunken.

LOS GATOS CANNING CO., July 24. Capital stock, $60,000. Directors—W. G. Beck, Irwin Ayres, F. H. Green, R. N. Simpson and W. T. Gorham.

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Con. California and Virginia, July 20, $42,935; Hanauer, 17, $4250; Ontario, 17, $33,850; Hanauer, 19, $3550; Queen of the Hills, 20, $1300; Hanauer, 20, $4600; Justice, 23, $4259; Commonwealth, 23, $13,000; Standard, 23, $8771.

THE property loss at Johnstown is now fairly fixed at $8,655,714. In the first confusion of the disaster it was put at $60,000,000.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 2.		WEEK ENDING July 10.		WEEK ENDING July 17.		WEEK ENDING July 24.	
Alpha	1.15	1.25	1.00	1.20	.90	1.10	1.00	1.15
Alta	1.40	1.45	1.20	1.30	1.20	1.35	1.30	1.45
Andes	.45	.55	.40	.40	.35	.65	.60	.65
Argenta	....	....	....	....	....	....	....	....
Belcher	2.80	3.40	2.65	3.15	2.60	3.00	2.80	2.95
Best & Belcher	2.90	3.60	2.85	3.40	3.10	3.90	3.45	3.80
Bullion	.65	.70	.60	.65	.65	.65	.65	....
Baltimore	....	....	....	....	....	....	....	....
Belle Isle	....	.20	....	....	.25	.25	.25	....
Bodie Con	1.30	1.35	1.10	1.20	1.05	1.35	1.20	1.40
Benton	....	....	4.00	....	4.00	....	4.00	....
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.30	.35	.30	.35	.30	.35	.30	....
Commonwealth	4.05	4.20	3.85	4.10	4 10	4.30	3.95	4.30
Con. Va. & Cal	7⅛	7⅞	7¼	7⅝	6⅝	7¼	7	7½
Challenge	1.85	2 30	1.75	....	1.90	2.00	1.90	2.10
Chollar	1 60	1.80	1.45	1.60	1.40	1.60	1.45	1.50
Confidence	....	6.00	5⅝	5⅝	5⅝	6¼	5⅝	6
Con. Imperial	.40	.45	.40	.45	.40	....	.40	.50
Caledonia	....	....	.20	....	.20	.25	.20	.25
Con. Pacific	....	....	....	....	....	....	....	....
Crown Point	2.40	2.75	2.00	2.55	2.10	2.30	2.10	2.15
Crocker	.25	.30	.25	.30	.25	.40	.35	.40
Central	....	....	....	....	....	....	....	....
Dudley	....	....	....	....	....	....	....	....
East B. & B	....	....	....	....	....	....	....	....
Eureka Con	....	....	....	....	1.00	....	....	....
Exchequer	.60	.70	.60	.65	.60	.65	.60	.70
Grand Prize	.65	.75	....	.70	.85	.95	.75	.80
Gould & Curry	2 05	2.40	1.80	2.10	1.85	2.20	2.00	2.10
Hale & Norcross	3.30	3.45	2.90	3.10	2.85	3.15	2.90	3.00
Holmes	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Iowa	....	....	....	....	....	....	....	....
Julia	.25	.30	.25	.30	1.30	....	.30	.35
Justice	....	1.40	1.15	1.35	1.35	1.75	1.70	2.15
Kentuck	1.15	1.20	1.00	1.25	1.00	1.00	1.05	1.15
Lady Wash	....	.40	....	....	.35	.35	.40	....
Locomotive	....	....	....	....	....	....	....	....
Martin White	....	....	....	....	....	....	....	....
Mono	1.00	1.10	.75	....	.80	1.05	.90	1.00
Mexican	3.00	3.90	2.75	3.40	2.75	3.10	2.85	3.00
Mt. Diablo	....	....	....	....	....	....	....	....
Navajo	....	....	....	....	....	....	....	....
North Belle Isle	.80	.95	1.05	1.25	1.05	1.50	.95	1.15
Niagara	....	....	....	....	....	....	....	....
Nev. Queen	.80	.95	1.30	1.45	1.60	1.80	1.35	1.50
North G. & C	....	....	....	....	....	....	....	....
Occidental	1.40	1.60	1.50	1.70	1.70	2.40	1.90	2.30
Ophir	4.35	5⅛	4.30	5⅛	4.35	5.00	4.55	4.85
Overman	1 10	1.15	1.00	1.05	.90	1.00	.95	1.00
Peerless	.35	.40	.40	....	.35	....	.35	.40
Pcer	.20	.25	....	....	.15	....	....	....
P. Sheridan	....	....	....	....	....	....	....	....
Silver Star	....	....	....	....	....	....	....	....
Savage	1.90	2.15	1 65	1.85	1 60	1.85	1.65	1.80
S. B. & M	1.70	1.90	1.95	2.15	1.70	1.90	1.85	2.00
Sierra Nevada	2.95	2.45	2.15	2.55	2.15	2.45	2.25	2.35
Silver Hill	.40	.45	.40	....	.45	.55	.50	.65
Silver King	....	....	....	....	....	.85	....	....
Scorpion	.20	.25	.20	....	.20	....	....	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	....	....	....	....
Union Con	2 90	3.55	2.80	3.25	2.80	3.15	2.85	3.00
Utah	.90	1.05	.70	.90	.70	.75	.75	....
Yellow Jacket	2.85	3.25	2.75	3.00	2.80	2.90	2.80	3.00
....	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY, July 25, 9:30 A. M.			
	50	Con Va & Cal	7.00
	100	Hale & Nor	3.00
190 Andes	60c	300 Justice	1.75
200 Baltimore	05c	100 Mexican	2.85
50 Belcher	2.80	300 Nev. Queen	1.25
350 B. & Belcher	3.50	150 New York	70c
50 Bullion	60c	100 Occident	2.20
100 Bulwer	30c	50 S. B. & M	1.80
500 Caledonia	20	200 Utah	75c
50 Chollar	1.45	100 Utah	80
200 Con. Imperial	45c	200 W Comstock	55c

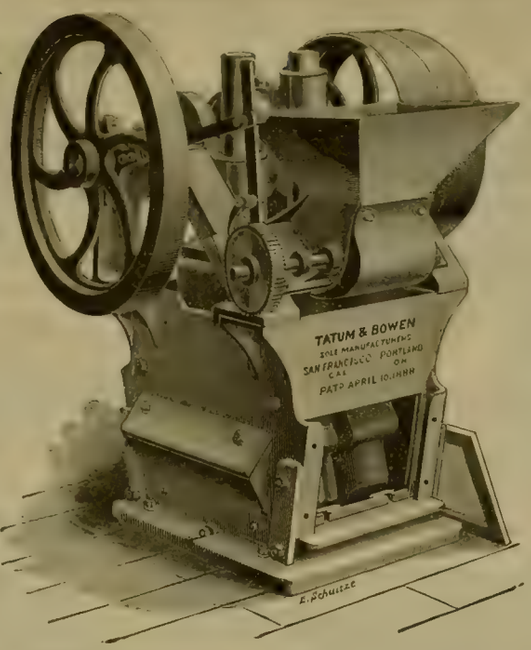
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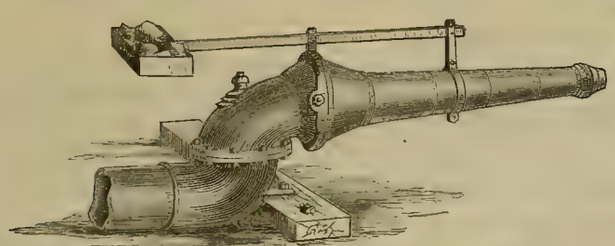
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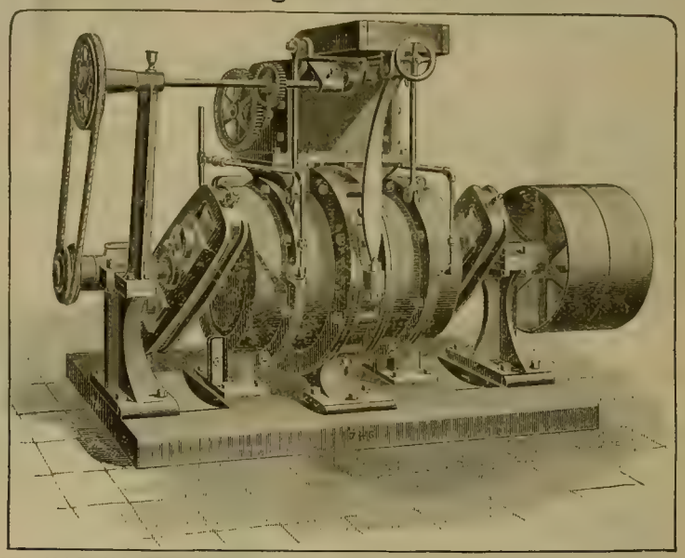
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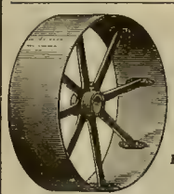
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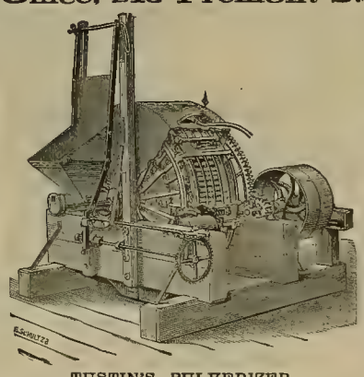


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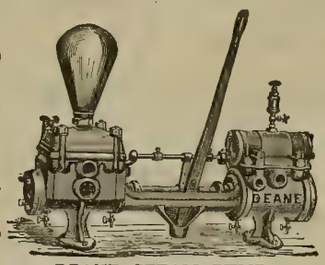


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A few copies of this work, the only one ever published treating of Pacific Coast Coal Mining, have been obtained, and are for sale at this office for $2.50 per copy. It was written by W. A. Goodyear, Mining and Civil Engineer, formerly of the California State Geological Survey.

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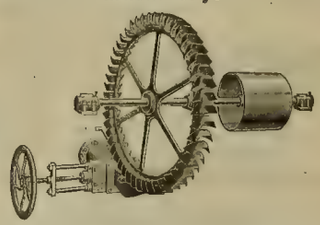
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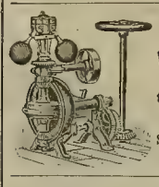


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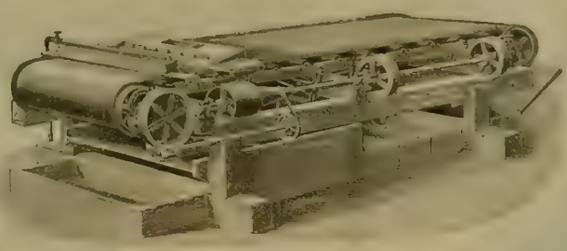
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THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
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N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., Room 15, No. 132 Market Street, San Francisco, Cal.

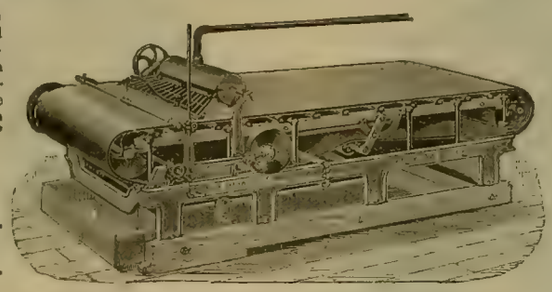
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The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - $650 f. o. b.
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Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

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At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vann or concentrating devices. DAVID McKAY, JR.,
[Signed] Sup't North Star and Original Empire Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

WM. H. TAYLOR, President. R. S. MOORE, Superintendent.

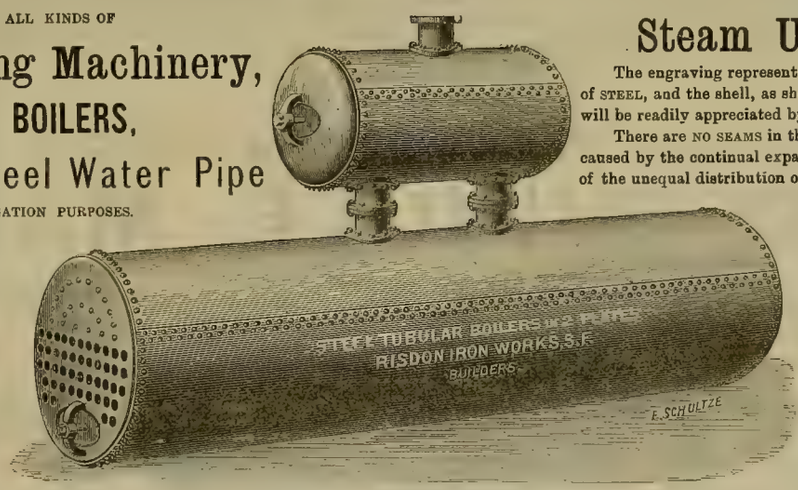
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There are NO SEAMS in the fire to leak, nor loose rivets to contend with, caused by the continual expansion and contraction of the plate on account of the unequal distribution of the heat under the boiler, the bottom presenting a smooth, even surface which can be easily cleaned. We place a manhole at the back end above the tubes, and one in the front end under the tubes.

The FRONT MANHOLE gives free access to the sheet over the fire, THE VITAL PART OF EVERY BOILER. This point is often overlooked by purchasers, and boilers are bought which have a small hand-hole, and the remaining space filled with tubes which allows absolutely no access for cleaning, and in a short time tubes and sediment are one solid mass, and instead of gain in efficiency by a few feet of tube surface, the result is a positive loss.

STEEL BOILERS IN TWO PLATES.

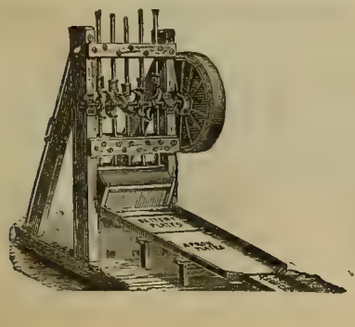
SPECIFICATION OF BOILER AND FIXTURES:

1 Boiler, 1 Steam Drum, 1 Breeching, 1 Smokestack, 300 Feet Galvanized Strand for Guys, 1 C. I. Front Complete, 1 Foundation Plate for Front, 1 Set Grate Bars for Coal or Wood, 1 Back Bar Bearer, 1 Ash Cleaning Door and Frame, 1 Back Arch Plate, 1 Set Binder Braces and Bolts for Brickwork, 1 Stand for Back End of Boiler, 1 Steam Gauge for Syphon, 1 Glass Water Gauge Complete with Column and 3 Gauge Cocks, 1 Safty Valve, 1 Feed Valve, 1 Blow-off Valve, 1 Check Valve.

These Boilers are tested to 150 pounds hydrostatic pressure and are intended for a working pressure of 100 pounds.

Boilers of the following Sizes in Two Sheets kept Constantly on Hand ready for Shipment: 60 Inches Diameter x 16 Feet Long; 54 Inches Diameter x 16 Feet Long; 48 Inches Diameter x 16 Feet Long; 42 Inches Diameter x 16 Feet Long.

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These Plates can also be purchased of **JOHN TAYLOR & CO., Corner First and Mission Sts.**

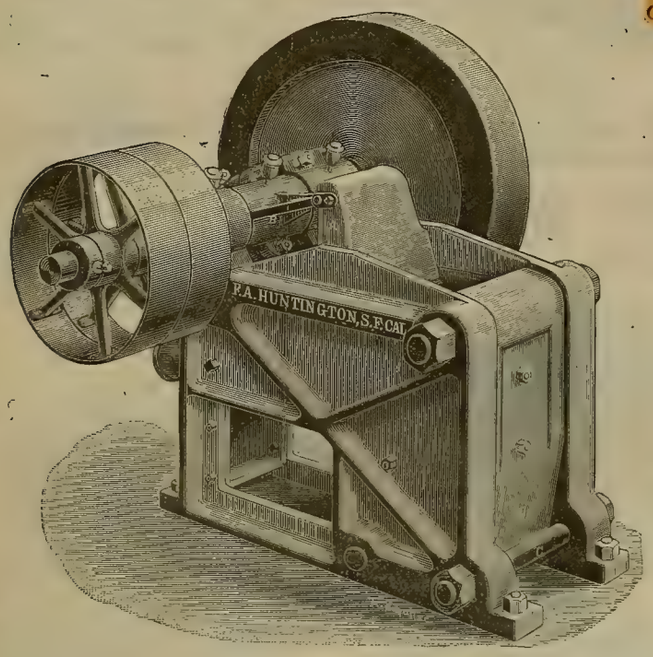
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MANUFACTURER AND DEALER IN

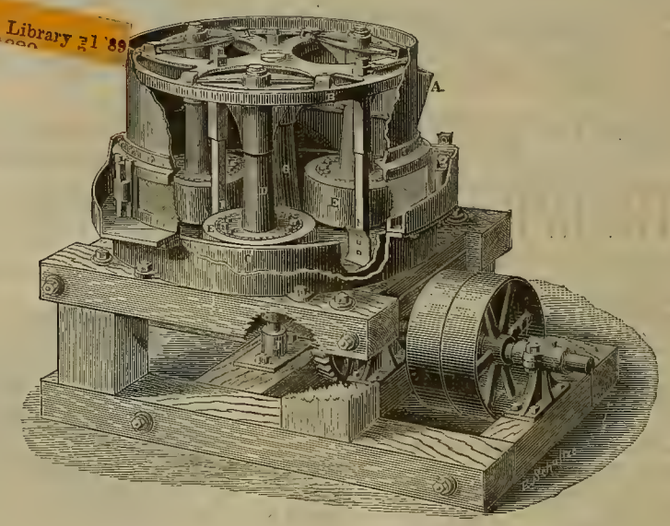
MINING MACHINERY.



Huntington's Improved Rock-Breaker.

The main features of this machine are strength, ease of adjustment and simplicity of construction.

The movable jaw *A* is worked by the eccentric *B* and is pivoted at the bottom. The stationary jaw *D* is secured at the top by a bolt running through it, and at the bottom bears against the heavy bolt *C*. The main wear is, of course, at the bottom of a breaker of this form, and the wear is easily taken up by inserting a plate between the bolt *C* and the jaw *D*. The jaw is thus swung in at the bottom, and the opening where the ore passes through is made correspondingly smaller. As will be seen by the cut, this machine is of very simple construction and is strong and durable.



F. A. HUNTINGTON'S
Centrifugal Roller Quartz Mill.

The following will explain the above cut:

The ore and water being fed into the mill at the hopper *A*, the rotating rollers and scrapers throw the ore against the ring die, where it is crushed to any desired fineness by the centrifugal force of the rollers as they roll over it.

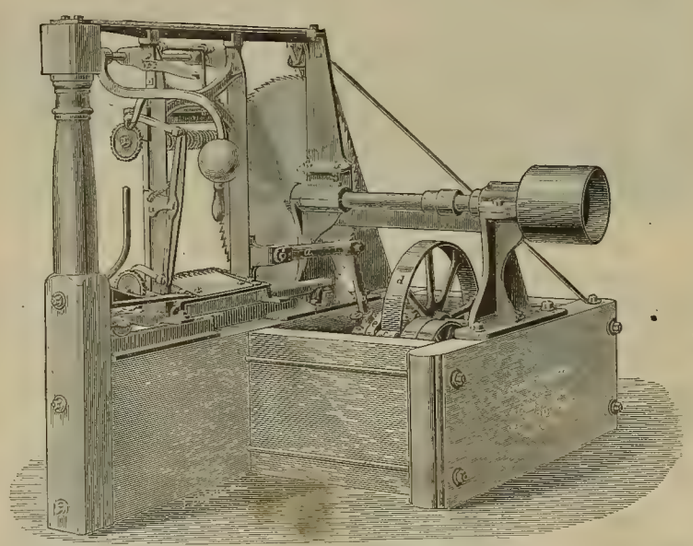
The water and pulverized ore are thrown against and through the screens when fine enough. The discharge is so perfect that it makes little or no slimes, and leaves the pulp in good condition for concentration. The rollers are suspended, leaving a space of one inch between them and the bottom of the mill, thus allowing them to pass freely over the quicksilver and amalgam without grinding it or throwing it from the mill, while it agitates it sufficiently to make amalgamation perfect. For wet crushing and gold saving it has no equal.

I claim especial merit in that feature of this system *which prevents* ALL FLOURING of gold and quicksilver, and the consequent loss of gold that attends stamp milling.

For the economical working of ore that contains sulphurets, I particularly claim the adaption of this mill. The rotary method of crushing the ore so granulates the pulp (which is discharged the moment it is crushed) that a complete concentration of sulphurets is rendered most easy.

F. A. HUNTINGTON'S
PATENT SHINGLE MACHINE.

This Machine is so well and favorably known by all the principal Lumbermen on the Pacific Coast that it is useless to go into any detailed account of its merits; suffice it to say that recent improvements in a new, quick return feed-works has placed it far ahead of all competitors. This feed-works is positive and uniform in its action and obviates all the jar or tremor formerly given to the machine by the weight used in the old style feed.



For simplicity, durability and rapidity of action, these machines have no equal, cutting from 50,000 to 75,500 shingles per day.

Price, complete with Jointer and one 38-inch Saw, $475.00.

The new feed-works can be applied to any of the old machines.

Price $100.

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F. A. HUNTINGTON,

MANUFACTURER AND DEALER IN

STEAM ENGINES AND MINING MACHINERY OF EVERY DESCRIPTION.

PRINCIPAL OFFICE, 45 FREMONT STREET, SAN FRANCISCO.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

TWENTY-PAGE EDITION.

VOL. LIX.—Number 5.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, AUGUST 3, 1889.

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Single Copies, 10 Cts.

An Endless-Rope Hauling Engine.

On this page is presented an engraving which shows one of the most approved endless-rope hauling engines for mining purposes. It will be seen that there are here two drums placed tandem. The rope is first passed over the larger and then over the smaller drum, as many times as may be found requisite to secure the necessary tractive force. The motion of the larger or hauling drum is controlled by a friction-clutch. The motive-power is furnished by two engines, actuating a pinion meshing with a spur-wheel keyed to the drum-shaft. The "idle" drum rests on sliding bearings, and slack rope may be taken up by draw-bolts, as shown.

In the endless-rope system we have to consider the amount of artificial tension introduced to prevent the slipping of the rope upon the drums. The tension depends, of course, upon the number of times the rope is passed over the hauling drum. In the case of the machine illustrated, where the rope has four half-wrappings around the drum, it is necessary to allow 20 per cent more stress in the rope than in the case of the counter or tail rope system.

Much surface wear is encountered in this application of wire rope; and for this reason it is advisable in all cases to employ the best steel-wire rope, composed of six strands of seven wires each laid about a hempen center.

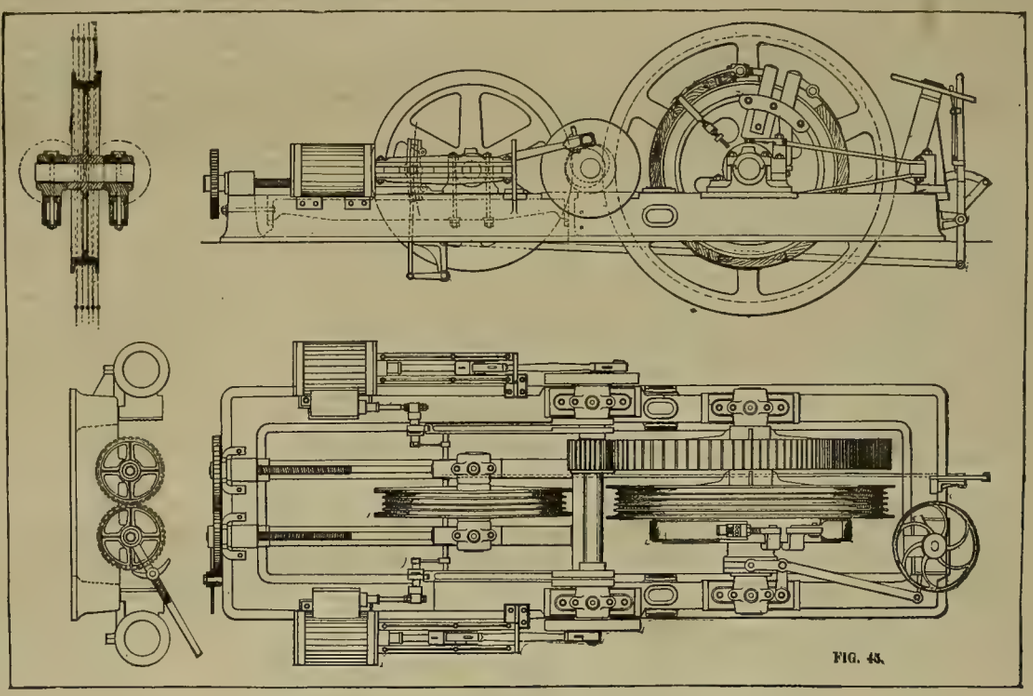
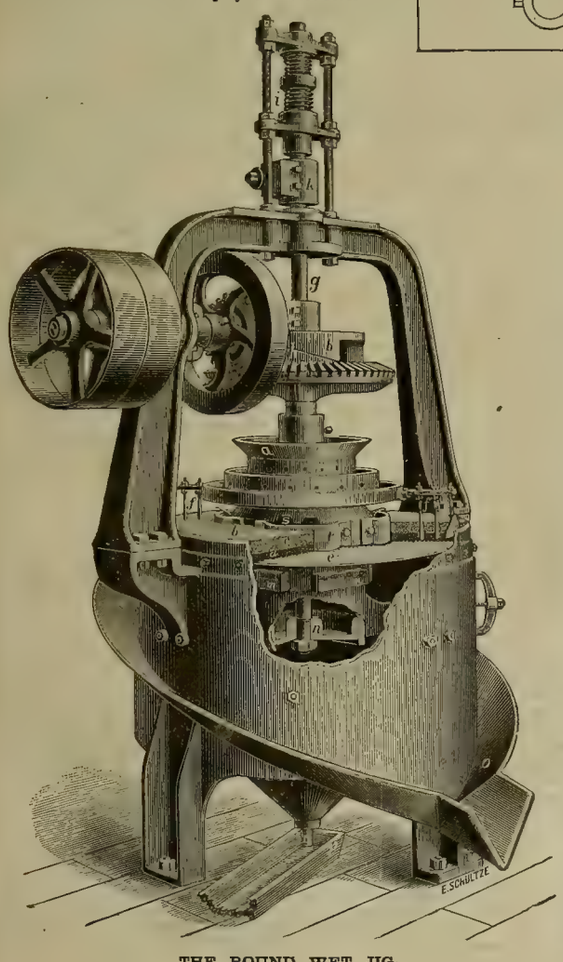


FIG. 43.

ENDLESS-ROPE HAULING ENGINE FOR MINING PURPOSES.



THE ROUND WET JIG.

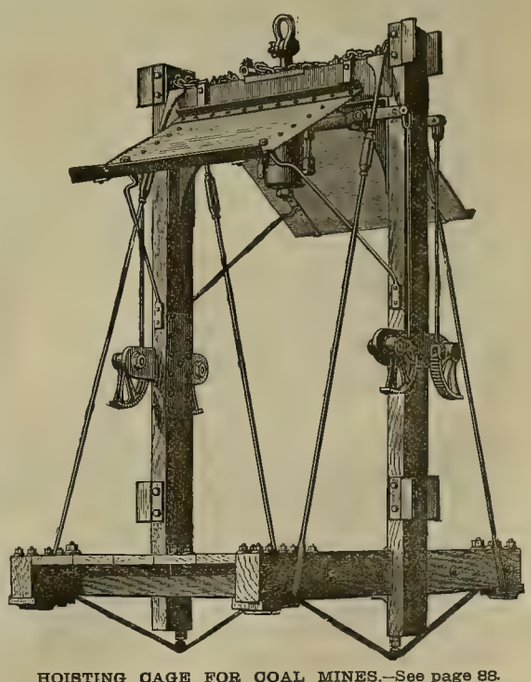
The Round Wet Jig.

It is claimed that many faults and difficulties met with in the square or rectangular-shaped jigs, such as are generally used, are to be traced directly to their form. The packing and consequent bad working of the ore in the corners is not only overcome in the round jig, but increased capacity, better work and less floor room are rendered possible. The feed and plunger being in the center of the machine, the ore going from the inner circle to the outer circle, or the discharge, gives the mineral and gangue easy conditions to separate.

The crushed ore and water are carried by a trough to the machine and into the revolving ring *a*, which distributes the ore on to the concentrating bed or screen *e*, which is a little coarser than the screen that the ore was crushed through. On this screen is put a bed of mineral a little coarser than the screen. This is for the purpose of letting all the crushed mineral pass through the concentrating bed and at the same time to prevent any gangue going through the concentrating bed. Motion is imparted to the revolving cams *h* by means of revolving gear and pinion, thus gently lifting the shaft *g* and plunger *n*.

The drop of the shaft and plunger after being raised to full hight by the cams is quickened by means of springs *i*, the tappet *k* regulating the stroke. The strokes of the plunger give upward impulses to the water, forcing it through the screen *e*, lifting the ore and allowing the mineral *d* to settle and pass through the concentrating bed and screen *e*, and pass out of the conical shaped bottom through a suitable hole in a wooden plug. The tailings or gangue *c* are taken and lifted off from the machine by the rotating shaped plow-like lifters on the ends of stirrers *ff* into the tailing trough *o*. The Parke & Lacy Co., 21 and 23 Fremont street, this city, are agents for these machines.

COL. BRIDGES of the U. S. Survey is credited with saying that by storing the water of the Carson river in flood-times, not only ranches but the mills along its course will have more water than they can use throughout the entire year.



HOISTING CAGE FOR COAL MINES.—See page 88.

Alchemy.

[Written for the PRESS by HENRY G. HANKS.]

COPYRIGHT 1889.

Mercury plays so important a role in the history of alchemy that these papers would be incomplete without at least a brief notice of the doings of those most remarkable men, the influence of whose discoveries on the present advanced state of civilization cannot be denied; for the random investigations and experimental researches of the alchemists laid the foundation of chemistry, and the intelligent reader will admit that our present state of advancement would be impossible without a knowledge of that noble science and its application directly to many of our essential arts, and indirectly to nearly all others. Not only were some of our most useful chemical operations and apparatus invented by the alchemists, but the foundation also of our theories was laid by them.

History of Alchemy.

The ideas which led to alchemy are older than generally supposed. Thales (640 B. C.) believed that water was the foundation principle of all things. Anaximander (610 B. C.) a disciple of Thales, taught that air was the creative principle. Xenophanes (600 B. C.) believed in one universal principle only, and declared "God is the one." Hippocrates (460 B. C.) first advanced the theory that there were four elements—fire, air, earth and water, which produced four cardinal humors in the human body—blood, phlegm, bile and black bile.

Alchemy must, like all things, have been the result of evolution; it had made some progress at the date of Diocletian in the third century, for that Emperor, after conquering the Egyptians in the year 296, ordered the destruction of all books giving instructions in the art of transmutation of metals, "lest the people so gaining gold, should again rebel."

Hermes Trismegistus is thought to have been the earliest alchemist who left writings. The exact date is not known.

When from 406 to 640, barbarian hordes swept from the north and checked civilization, the arts and sciences were paralyzed and driven to Arabia and elsewhere, where they continued to flourish.

Many of our chemical words are Arabian, as Alcohol, Alchemy, Alkali, Alembic, Elixir, etc.

In the Middle Ages, alchemy gained a strong foothold. The following were noted alchemists: Geber, eighth century; Raymond Lully, 1235–1315; Albertus Magnus, 1193–1280; Bacon, 1561–1626; Paracelsus, 1493–1541; Basil Valentin, born 1410; Van Helmont, 1577–1644; Glauber, 1604–1668; Homberg, 1652–1715.

The astrologers preceded the alchemists, who retained their names and applied them to the elements and such chemical combinations as they were familiar with; for which reason the alchemistic names of the metals were as follows:

Gold	Sun.
Silver	Moon.
Copper	Venus.
Iron	Mars.
Lead	Saturn.
Tin	Jupiter.
Quicksilver	Mercury.

While the main object of the alchemists was to make gold by transmutation from inferior metals, the love of experimental research took possession of them, and held them regardless of their will by a sort of fascination so well understood by modern chemists. There was another incentive to the pursuit of alchemy; those who termed themselves "adepts" assumed and were accorded a measure of superiority by those ignorant of their arts, while they were held in esteem and credited with great learning.

A similar condition of things may now be observed among the American Indians, who have soothsayers, magicians, and medicine-men, as did the ancient Greeks and Egyptians.

Alchemy was called by several names: "The sacred art," "The black art," "Great work," "Pyrotechnian art," etc.; and those engaged in scientific pursuits, then as now, were by a common interest joined in an unorganized brotherhood.

No disappointment discouraged the alchemists, and the search for gold, like stock-gambling in modern times, became a mania. They conducted their operations with great secrecy, and expressed themselves in mysterious and allegorical language. This seems to have been for several reasons; the conflict between religion and science had already begun, and they were actually in danger of being accused, apprehended, and even burned at the stake. It was a pleasure, too, to receive the adulation, or something akin to it, from the masses. The latter motive lives in modern times, and causes the physicians of to-day to write prescriptions in Latin, and to express by symbols the commonest substances.

Some honestly believed in these ideas and pursued them with great diligence and persistence to the sacrifice of all else; while others, pretenders or knaves, lived on the credulity of the ignorant, who advanced means to carry on their experiments, very much as country store-keepers in California supply "grub stakes" to a certain class of prospectors who seek a lost mine, or invent a secret process to work rebellious ores.

The writings of the alchemists which still exist are so enigmatical and obscure as to be almost worthless, but are supposed to have been understood by the adepts. The following is an example written to instruct the reader in the art of making gold by transmutation, with the supposed meaning:

"Catch the flying bird" (mercury) "and drown it so it can fly no more" (form an amalgam with gold); "quench it in the philosopher's well" (aqua regia), "by which its soul will be dissipated and its substance united to the Red Eagle" (ter-chloride of gold), etc. But by following the most detailed directions left us, no expected or promised result can be obtained.

Geber claimed to be able to change mercury into gold "without the help of anything more than its multiplication." In the occult language of that period he writes: "Bring me the six lepers that I may cleanse them," meaning the other metals then known—lead, tin, copper, iron, silver and gold. His descriptions were so obscure and unintelligible that the word "geberish" was coined and applied to his and the writings of other alchemists.

Artephanes (12th century) was said to have lived to the age of 1025 years through the potency of his medicinal preparations.

Gases, essences and distillates were first called "souls," then "spirits," which name is still retained and applied to alcohol, spirits of niter, turpentine, etc.; and much of the apparatus of the modern laboratory is either identical with or modeled after that of the alchemists.

Theories and Causes that Led to Alchemy.

The alchemists sought a universal ferment, a solvent, also universal, known as "alcahest," and a fountain of life, as well as the art of transmutation. These ideas began to concrete about the time of Hermes, and continued through the fourteenth, fifteenth and sixteenth centuries.

Until the end of the seventeenth it was generally held that all metals were compounds, and that any one, including gold, could be produced at pleasure, if the secret could only be obtained from those who it was thought had discovered it. Instances were related of certain impecunious alchemists who had suddenly acquired great wealth. The general gist of this very natural belief was as follows: They assumed that there was a solid substance of a red color and great weight which could be artificially prepared, and if introduced in small quantities into a red-hot crucible, with a base or imperfect metal in a state of fusion, observing certain mystical precautions known only to the adepts, they would be changed into gold, which could be cast into an ingot in the usual manner. This substance was the Philosophers' stone, called also by other names. There was, too, a supposititious fluid, also of a red color, a few drops of which, if poured on quicksilver, silver, lead or other base metal in a state of fusion, would change it to pure gold. This, called also an elixir, if used as a medicine, not only cured all diseases, "unless the principal parts had perished or the predestined time for death had come," but renewed youth and arrested old age. In this form it was called the "Panacea." There was also a stone and an elixir, but white in color, which changed base metals to silver.

Metals were considered living individuals, and the gases sometimes generated in their decomposition, as their departing souls. The known metals were regarded as being perfect and imperfect; the latter were supposed to be unfinished by nature. And it was thought that if the missing element or constituent could be known, and added, a perfect metal, gold or silver, would result.

The fluid condition of mercury, its great specific gravity and other properties, early attracted attention, and its study by the alchemists led to the discovery of the amalgams and to the attempts to produce gold by its aid. While, like the ancients, they were still doubtful as to its character, the adepts placed it among the metals, of which it was the seventh, all then known to them.

Raymond Lully wrote as follows: "Bodies dissolved in mercury are not decomposed. Their nature remains hidden in the mercury until they fill up its intervals. Mercury contains interstices, and therefore metals can be hidden in mercury."

Geber believed that all metals then known were composed of mercury, sulphur and arsenic, and was first to advance this theory.

Becher, a German chemist, born 1630, claimed the existence of a mercurial earth, and considered the metal to be a compound of this with two other distinct substances or principles, one vitrifiable and the other combustible.

One of the earliest chemical experiments was to cupel lead from argentiferous galena. A portion of silver remaining, it was inferred that the lead had changed to silver. Cupellation was discovered by Geber.

Copper ores were dissolved in acid, yielding a colored solution, from which immersed plates of iron precipitated metallic copper, leaving the solution colorless, and it was believed, very naturally, that the iron had changed to copper. These and similar reactions served to verify theories and encourage search for the Philosophers' stone.

The following quotations from the works of various comparatively modern writers will convey to the reader some idea of the general opinions of the times.

The writer has a much-prized volume entitled "Discovery of Subterranean Treasure," by Gabrial Plattes, 1639, who is said to have died of starvation in the streets of London. On Folio 40 he carefully describes, in quaint words, how he obtained pure gold from other metals. The following is briefly the operation:

His ingredients were eight ounces of regulus of iron and copper, 16 ounces common sublimate bought at the apothecaries'; they were reduced to a powder separately and then ground well together on a marble slab. He put them into a glass retort and submitted them to distillation, first obtaining an oily substance like butter, and lastly a yellow sublimate tinctured with iron and copper. This he redistilled three or four times until very pure, then mixed with equal parts of amalgam of quicksilver and silver, which was put into a second retort of glass. All the mercury came over, leaving the silver like yellow horn. This silver he amalgamated again with new quicksilver and set it in a gentle heat for a week, then a very strong heat for six hours, "so that the quicksilver rose up and fel downe again upon the silver till such time as that it had carried up all the silver from the bottome of the glasse into branches like trees; then I melted downe the silver and fined it and parted it with aqua fortis and had divers grains of pure and good gold abiding all tryalls, but the quantity would not pay for halfe the charges and labor."

He then describes his method of making the regulus referred to above. He took four ounces of stub nails and made them red-hot in a crucible, then put in eight ounces of crude antimony and melted them together; when cool, he broke off the regulus, made a similar preparation of antimony and copper, mixed equal quantities of each and melted them together three or four times, to every casting adding half an ounce of saltpeter. The result was a white metal like silver, but brittle. It could be pulverized in a mortar.

The silver, "like yellow horn," amalgamated with difficulty, only by grinding with addition of salt and vinegar. The original silver was "water allver," which he bought from the refiners, from which they had taken all the gold. This amalgamated easily. The amalgam was strained through a skin of leather and then mixed with the yellow sublimate. The proportion of the quicksilver to the silver was five or six parts to one. His concluding remarks are so curious that they are quoted in his own words: "If any one doubts the truth of *alchemy*, he may be satisfied by this tryall; but instead of gaine he shall pay for his learning by going away with losse. I do not deny that there are workes of lesse losse and charge, yet but none of them lucrous by reason of the change of times.

"For if any one will uphold me as good a lease or purchase of land as I can prove by credible records hath bin in former times for an ounce of gold, I will undertake to make an ounce of gold by art to pay for it, and yet have a good bargaine.

"But the difference of times hath confounded this art, as may appear more plainly beneath.

"First, in ancient times a man's work was not worth a penny a day, which is now worth two shillings and six pence a day, as may appeare by ancient records for buildings and the like; so that there is thirty to one losse in the workmanship.

"Secondly, then coales, vessals & other things necessary for these affaires did cost but little, in respect to the charge now.

"Thirdly, when gold was made, it would have bought thirty or fourty times as much, either lands, leases, victuals or workmanship, as now.

"So that I conclude that then the owners of this Art might gaine 30 or 40 to one, and yet now they shall lose extremely.

"The cause that moved me to search so much into these affaires was because I saw by the bookes that divers men in divers ages and in divers Countries did agree in one tale; whereby I conceived it unpossible to be a lye; now I conceive it might be true, but that the times have made an alteration."

This account reads like the writing of an honest man, but his methods being crude, it is likely the materials used by him were so also, and the small quantity of gold obtained lay hidden in some of them by him unknown and unsuspected.

The following, a translation from the "Journal of the Voyages of Monsieur de Monconys," 1645, is an illustration of the vague manner of wording so-called instruction for the transmutation of metals.

Volume I, Folio 34. "Meditations for the Natural Production of Metals and the Artificial Method of the Philosophers' Stone."

"Nature sends constantly from the center of the earth a warm and humid vapor which is the cause and principle of all life and of mineral and vegetable productions. When joined to earthy and material particles, it makes a substance which unites with and forms a part of all mixtures, which differ only in their composition, but are animated by a single spirit, *Mercury*, of which all metals are formed. When this vapor passes across an earthy substance, dry, penetrating and sulphurous, it is easily attracted and joins itself to it, because everything dry desires to be moistened; and as this vapor or mercury is forced by the central heat of the arch which constantly eludes it, it passes over, charged each time with some small portion of this earth, until it meets the vaults of mountain caverns, whence it falls back on the earth it had moistened in passing. Here it is reheated and again forced by the heat to a higher point from below, more fully charged from the earth than before, which obliges it to fall frequently after many sublimations and precipitations.

"At last all this mercury is absorbed by the dryness of this earth, and by the internal heat it is formed into a compound which we call *Metal*, the material of which, as well as the essential form, is the same in all, differing only accidentally by lightness and color. The first difference is weight, imperfect metals being much lighter than perfect ones. The cause of this is that in their composition are mingled larger and more heterogeneous particles which hinder the perfect union which is found in mixtures of subtile and homogeneous parts; for it is evident that as there is more space in a pile of apples than there would be in one of millet of the same volume, and as 1000 cubes would arrange themselves better and would unite more perfectly than 500 cubes, 300 spheres and 200 cylinders, so the larger and heterogeneous parts mingling in the composition of metals prevent the perfect union of the subtile and homogeneous ones, and cause an infinity of space, from which proceeds their lightness and the ready entrance of external agents which easily destroy them.

"The second difference is the color; for if all metals were equally heavy and yellow as gold, they would *be* gold likewise.

"The same cause which has rendered them light has prevented them also from being yellow, and the aqueous humidity which still dwells in their composition and which the heat of the earth only evaporated a little, not dried entirely, contributes more to it, because it is not only distributed between the subtile and essential parts of the metal as are the large dry particles which disturb the order and arrangement of it, but it covers the surface of the homogeneous parts and thus prevents the reflection of the light from coming to our eyes with the same strength that it would, had it been modified by the dry and metallic surfaces; and since the Philosophers have said that the action of heat on dampness produces black, and upon dryness white, we are able to conclude that where there is perfect dryness it causes yellow. We may remark this in bread, which, being only a mixture of flour and water, that is to say, of dryness and moisture, takes nevertheless various colors, in proportion as the fire has dried it more, and disarranges or orders differently the small parts, and consequently disposes their surface in another manner.

"If it is in this fashion that Nature makes metals and our desire is to make them also, we must imitate her. We must take, like her, that dry earth, subtile and sulphurous, and the mercury or hot and damp vapor; then inclosing them together, sublime and circulate them until they fix themselves into a metallic substance which by long baking will finally become gold, and the more easily, and the more often, because we can beforehand purify this earth, and employ a much greater and more steady heat than the central arch.

"But the wish of the Philosopher is to make a powder, fusible, subtile, penetrating and colored, in order that by its susceptibility it can melt at the least heat, by its subtility it can insinuate itself into the tiny pores of the metal, and by its penetration it can enter and mingle perfectly in all parts even to the center in order to join itself to them and make them unite perfectly by fixation. After having driven away the heterogeneous parts which prevented it from doing this, by its own exuberant color, which is a dryness greater than gold, it finally dries the imperfect metal and stains it a perfect color. If there is any substance suitable to make this powder, it should be to my thinking that earth dry, subtile and sulphurous, which Nature has furnished for the production of metals, because it has already many of the qualities necessary to this powder, principally fixation or dryness. For if when it was yet all crude, humid and feebly aided by the heat of the arch, it had the power to fix the subtile and fugitive, hot and damp vapor, or the mercury of the Philosophers; then when art has given it its perfection and the qualities we demand, it will not only fix the same crude vapor which it did before, but this vapor condensed and cooked into a metal, although imperfect, as we can see in the example of flour, which, having the power to absorb water and thicken into a tender and soft paste, will easily harden and dry if we add to it anew from below. But if instead of this crude flour we throw on this paste some pulverized biscuit, the dryness will without doubt be much greater and more quickly attained.

"It is necessary to look for the ways and places where we can find this earth. Since it is hidden by Nature, it is only with difficulty that we can obtain what she gives us roasted and mostly prepared, and without any mingling of heterogeneous impurity, as in gold, which, using the comparison above, is like a very dry biscuit, which can, without any help of art, dry other pastes a little more than they now are, but not as much as itself, unless it subtilizes them so much that it can mix itself with them *per minima*, according to the terms of the schools. But it is in this that the chief science consists—in knowing how to perfectly subtilize the salt—and I imagine it can be done only by breaking and dissolving it, and that as it coagulates only by the junction of mercury with all its material parts, which it holds joined one to the other by its viscous and glutinous quality; it can only loosen them by separating skillfully this humor by means of its like, in which, having thrown gold, it dissolves immediately, because it has the power by its subtility to enter into the pores of this metal, where, being introduced, its like joins itself to it, as snow to water in which it melts, and leaving the ma-

terial part of the mixture which it held, it diffuses itself perfectly and radically.

"Before explaining the manner of drawing out this earth and preparing it for the use we desire, it is necessary to find out where to get this mercury, this natural dissolvent which is found in all the mixtures of nature as the most essential part of their composition. Nature draws out and dissolves them only by the ministry of crude and indeterminate mercury which is diffused in air, water and earth, which, penetrating the seeds it meets with, corrupts them and joins itself to the mercury they inclose, which is specified and had the character of the individual it made, which it impresses on this mercury, which has none, leaving it no inclination to the particular formation of any mixture save that to which the matter and the matrix which it meets forces it.

"But afterward, when the specified mercury it has disengaged from the mixtures impresses its character on it, it disposes or effects in like way all the matters which it meets. It arranges them according to the inclination it has received from the other mercury, and this is, to my thinking, the most likely fashion we can imagine of the multiplication of species and individuals.

"Following, then, this reasoning, if in order to disengage the mercury from the gold it is necessary to make use of that which we have first drawn from some other mixture, we must have plenty of gold beforehand in order to draw out this mercury, and thus we are convinced of the necessity of having it all pure, natural and free and for the most part indeterminate, because, as I have said, the mercury extracted from the mixtures being specified, impresses its character on the mercury it meets which has none, and also upon that which has, but which is less than it in quantity and more feeble, consequently unable to resist the powerful movement of the other; and supposing that they can extract without the aid of any other mercury that of some mixture which finds itself feebly held, as by example in some vegetable, the quantity which would be necessary of it in order to extract that from gold being infinitely greater than that we should draw *from* the gold, there is more reason that it should impress the vegetable character on the solitary mercury than receive from it the metallic inclination which is necessary for the physical powder. By this we may conclude the second time that it is only necessary to extract from any mixture, by disengaging itself, some small particle of corporeal and terrestrial matter which shall alter its natural subtilty necessary to introduce it into the pores of the gold which it is to dissolve.

"To which reason we may add a fourth—that there is a very little mercury in every mixture, and it being necessary to have a good quantity of it to dissolve the gold, in order to have a sufficiency of it, there must be labor, time, and an extraordinary expense in dissolving a great number of mixtures. We may then conclude that it is necessary to take this mercury or dissolvent from magnesia, where Nature has inclosed it very lightly, so that drawing it from thence without difficulty, we may receive it pure, indeterminate and in such quantity as we may desire after having excited a little its dissolving property and prepared it according to art, by some decoctions in which the first operation consists of magistry. Having placed it in a state of perfect dissolution, we may make it destroy the body—that is to say, we place the gold within, in order to be dissolved there, imitating in this last operation the proceeding which we have told in the commencement; how Nature holds it in the formation of metals, and this we must find out and apply in order that the Philosophers may imitate nature. This cannot be wholly verified, since Nature only *makes* metals, which the artisan makes no pretense to, having only designed to make a powder or a medicine for imperfect metals, which Nature has never undertaken to do. Nevertheless, it is necessary to imitate in the making of the powder the method she has taken in making the metals. We must then inclose our mercury in a perfectly tight vessel with calcined gold as Nature shuts it up in the mountain caverns with metallic earth; and by the continued heat of artificial fires, which imitate the arch, this spirit is sublimed and falls frequently upon the earth, which at last corporizes and fixes itself with it, and this much quicker than it could have done in the inclosure of the mountains, from the greater and more continued heat employed, which is not altered by the diversity of the season or the accident of a number of exhalations which cross these places. From which cause the earth used by the artist is much more dry than when Nature employs it, and has acquired the degree of metallic decoction *par dessu*, which has given it more force to dry this mercury and the hot and damp vapor.

"Finally, in the philosophic operation, the earth having much more disposition to fix than it had in the first operation of Nature, it is necessary that it should subtilize and divide itself into as many parts as there are spiritual parts to fix, and the spiritual parts being in less quantity than the corporeal which they unite and simply color, are easily absorbed and dried by them; but in the making of the powder it is necessary that a little of the corporeal molecules should be divided into as many parts as there are spiritual atoms subtile and indivisible, with each one of which it is necessary to mix some dry and corporeal atoms in order to fix and keep them, so that repeating many times these dissolutions and coagulations of the same corporeal parts, with the addition each time of a new quantity of the spiritual, the corporeal subtilize and divide themselves so finely that one cannot tell if they are spiritualized or the spirituals are corporealized, and by this philosophic operation this admirable powder is perfected and completed, and it has acquired the necessary qualities for projection.

"For it is fusible on account of the warm and damp vapors of which it is composed, it is subtile from the division of the corporeal parts into as great a number as there are spiritual, which then, not being weighed down nor arrested by any corporeal matter at the least heat which excites them, enter easily into the most ferruginous metals when these are ever so little opened by heat, and join themselves to all their parts, and having driven away what was impure and heterogeneous, they unite perfectly one with another.

"Then it fixes them by its great dryness, which has been increased in it by various decoctions of art, and this dryness raises it to a supreme and lively color infinitely beyond that of gold which it communicates to the metal, which is lacking in it, and leaving it fixed and highly colored, corrects its imperfections and makes of it a perfect metal."

Dr. Helvetius gives an account of transmutation in Hague in 1666: "Here, by the smallest portion of the Philosophers' stone, a great piece of common lead was totally transmuted into the purest transplendent gold." He gives a detailed account of the occurrence, which the reader of this may find quoted in the first volume of Brande's Chemistry, Third Edition; London.

Quotations from "Pyritologia; or, a History of the Pyrites," by J. F. Henckel, about 1740:

Folio 47, Foot note: "Dr. Meuder, in his analysis of antimony, seems to allow of no arsenic in the regulus of antimony. Our author speaks according to the common opinion, viz., that the regulus of antimony is a mercury fixed by arsenical vapor."

Folio 201: "* * * This, however, I must here say for arsenic (not out of any alchemical views, but only in regard to its universal treatment in ore-smelting and the like, and from some experience I have had of it), that it wants not a great deal to become silver."

Folio 217: "* * * I would not here be understood as depreciating the following propositions: 1. That a perfect, or, if you rather choose it, a ripe metal may be made from an imperfect metal. 2. That some pyritæ are not without some small share of gold, the first experience of every one may confirm in the least conversant in the business of minerals and metals with any care and attention, though the thing cannot be reduced to any certain theory or rule to be depended on at all times. But in all these proofs, where, for instance, copper and iron particles are transmuted or converted to gold, as also some particles of lead, tin, regulus, etc., to silver, it may by no means follow that iron and copper are an immature gold; or lead, tin or regulus, an immature silver.

"Metals are undoubtedly near allied to each other, though why so in the ascending and not in the collateral line? and philosophers borrowing the term *maturation* from the vegetable kingdom, it is only in the way of comparison, and serves merely as a demonstration but does not amount to an illustration; either it is out of a certain deference to the *great work* they forbear the use of the term *transmutation*, or to avoid falling by the ears with the Aristotleians, who, from their doctrine of genus and species, disclaim all transmutation of metals."

Folio 239: "* * * Gold and silver can never be called formal till they have attained their metallic form, and once thus, they become mature, or, as we speak, '*grown;*' but the metal is to be considered in the ore no other than an earth, which either the sulphur, the arsenic, or both together have penetrated, dissolved and drank up; or which appears barely in the form of an earth or stone without any observable sulphur or arsenic. * * * I must needs abide by Geoffroy's conjecture in opposition to M. Lemery; namely, that for a metallification of a metallic earth, something, namely, a fatty inflammable matter, must be incorporated therewith."

Folio 242: "* * * and should more than two different parts of pyrites, nay, any other foreign matters employed, contribute to the ground mixtion of such *gold earth*, we must rather adopt the terms *introduction, production, transmutation*, etc., and drop that of separation"

"Alchemistic Experiments by Homberg," quoted by Henckel from Mem. de la Acad., etc., l'An 1709, folio 141–142: "Take between one and two *marks* of silver, which, being assayed in the usual manner with aqua fortis in order to ascertain its containing no gold, melt an hundred times over, and having continued it each time in flux for an hour at least, *deport* it. You will procure a very sensible quantity of gold which before was not to be found in the silver.

"Take and dissolve a *mark* of silver in aqua fortis and remove what remains undissolved in the bottom of the glass; throw down this solution with common salt, edulcorate well and precipitate and dry it; to this silver calx take half as much regulus of antimony well purified and reduced to a fine powder, mix all well together, and being put into a retort, drive it in a sand heat and there will come over about three ounces or more of butter of antimony; raise your fire to the highest pitch, and you have the silver in the bottom of the retort mixed with part of the regulus of antimony; put this silver in a crucible in an open [illegible] fire, where let it fume till it can no [illegible]r till the r[illegible] ulus be entirely gone off; [illegible] the silver on more, nay twice, with a little borax and saltpeter, and it will prove as fine and ductile as tested silver; then granulate and dissolve it in aqua fortis and you will have a number of small black specks which being melted prove genuine gold. Repeat this with the same silver a second and a third time, and you will always procure some black gold calx.

"In the first process, the particles which are proximately fitted to become *gold* begin to be perfect, and fall down as small flocks; in the second there are some more prepared and perfected, and in the third none at all; when it appears that the particles fitted to be gold are by the two first operations quite exhausted or grained out of the silver.

"Here it may be objected that the regulus of antimony (regule de Mars) has produced or educed this black calx from itself; if so, there must as much be produced in the second and third operations as in the first; whereas in the second there is not so much as in the first, and in the third none at all. To this add, that we very often meet with grown native *gold* in the earth much paler than a fine sort should be, yet without yielding the least silver, and which by a repeated smelting begins to become perfect, and to attain its due color. Thus we find in silver a matter which turns to gold, and in *gold* a pale (blanchatre) matter which by the fire gains the genuine *gold* color. These are the two matters, which are a middle metal between gold and silver, but which remain not long in this state, being by each smelting brought still more and more to the perfection of gold."

From "Collection of Fifteen Hundred Chemical Processes," by Johann Joachin Bechers, Med. Doct., Halle, 1726:

Folio 345: "Take eight loth clean mercurial sublimate in a new crucible, and two loth fixed sulphur powdered; spray over and set it in a gentle fire. When the mercury is hot, so melt the sulphur like wax, and do not let the mercury sublime. When the mercury is heated, it will jump, for which reason set the crucible so that it will not fall. When they flow together, take first a piece of antimony as large as a bean and drop it in. Do this three or four times, so refresh the mercury and cool the sulphur. The mercury will commence to look like fine silver. Dissolve in aqua fortis and you will find in two marks of silver four loths of gold."

Abbe Raynal, 1770, thus records the theories prevalent in his day:

"The origin of metals has not always been well understood; it was long thought that they were as old as the Creation. It is now believed with greater reason that they are formed successively; in fact it is impossible to doubt that Nature is continually in action and that she exerts herself with as much power in the bowels of the earth as in the regions of the sky.

"According to the conjectures of the naturalists, from large caverns which are perpetually heated, there arise continual exhalations; these sulphurous and saline liquors act on the metallic particles, attenuate them and divide them, and put them in motion. Within the cavities of the earth they again unite, and becoming too heavy to support themselves, they fall one upon another. If in their several motions they have not met with other bodies, they form pure metals, which they do not if they happen to be combined with other substances."

Modern Alchemy.

More recent chemists have believed in transmutation. Salmon, 1692, freely expresses his belief, as did Von Helmot. Bergman, 1735, after quoting the writings of others, writes: "Although most of them are very deceptive, and many uncertain, some bear such character that unless we reject all historical evidence, we must allow them entitled to confidence."

Having no knowledge of modern science, the earlier chemists did not realize that while combinations and changes were taking place as they observed them, metals were merely being transferred from one locality or position to another, sometimes mineralized, sometimes free, but believed that they were actually created or produced by the reaction of the elements, vapors, gases, and heated fluids. This led to the idea that Nature could be imitated and metals produced artificially.

It is not an uncommon thing at the present time to see in modern newspapers accounts of the discovery of the art of making gold from inferior metals, demonstrating that the idea is not yet obsolete. A late number of the Philadelphia *Times* published an article on this subject, stating that a man in that city, whose name was given, began the study of alchemy, gathered a large library of occult books in one of which he found directions which enabled him to make an ingot of metal *which he believed to be gold*, derived wholly from base metals.

It is a reflection on the intelligence of the present age that this idea has been reasserted and has found believers. It is singular that educated men can be found in the 19th century willing to invest their money upon such representations. It has been boldly asserted that certain rocks and mineral waters found near San Francisco contained all the elements of gold except one, known only to a few persons, and it was only necessary to supply the missing one to make gold, which could then be extracted by the usual methods. Money has also been expended in San Francisco to verify the assertion that by a secret process a certain amount of gold in the form of the soluble terchloride being added to an earth, by singular good fortune lying conveniently near the city and containing the imperfect metal, the gold could be recovered augmented by that in the rock, perfected by the art of the modern alchemist.

It is also a well-known fact that there are men in the United States who make a business of discovering mines and water by the use of the divining-rod.

Tuolumne Mines.

EDITORS PRESS:—The following group of mines on the mother lode of California are situated at Jacksonville, on the Tuolumne river, and are worthy of interest to the mining men of this State. A short report will perhaps bring them into notice, and benefit some one now or at some future time. They are named the Tuolumne, Stanley and Gladstone; area of group, 58 acres. They consist of large bodies of quartz of low grade, and can be worked at almost a nominal expense, for no shafts, tunnels, hoisting works or pumps are required, and will not be for very many years. They can be worked on the open quarry system. The rock is valued by its owner, Thos. Whitto, an experienced Cornish miner, at from $5 to $8 per ton, although rich deposits in kidney forms are found of many thousands of dollars in value. The owner has taken out considerable money the past few years, but feels the property requires capital to work it on a cheap basis by large mill-power of say 100 or more stamps. From the proposed mill site to apex of mountain, backs can be obtained of 400 feet. Any quantity of water is available drawn from the Tuolumne river. A ditch cut one-half a mile gives 14 feet elevation, suitable for turbine wheel-power. The ditch made sufficiently large to carry the required volume of water necessary for the wood, can be constructed at a cost not to exceed $7000. A frontage to the river can be purchased from the owner, who cultivates the small strip of land adjoining the river, for a small consideration; from base of mine to river does not exceed 400 feet. This is sloping land, well adapted for a mill-site, etc.

The veins will average in the aggregate 60 feet. The base of operations should be at the Tuolumne mine, being the nearest to the river. The veins crop out at the surface, and continue exposed for nearly 900 feet. There is a good road to the mines. The nearest railroad is station Oakdale. Freight is three-fourths of a cent per pound. Work can be carried on all the year round. This group has merit and will bear investigation.

ARGUS.

Arizona Notes.

EDITORS PRESS:—Having taken a trip through the mineral belt running south of Prescott as far as the Oro Bel'a mine, I was astonished at the interest taken by the miners in the establishment of the Yavapai Development Company. The success of this enterprise will create a home market for hundreds of tons of ore which are piled up on the dumps of too low grade to admit transportation out of the Territory. As far as I can learn, the plan of that company is to establish amalgamating and concentrating works at mineral centers, purchase ores directly from the miners and convert them into a form capable of transport tion to general reduction works to be established at Prescott, the present terminus of the railroad.

This plan, properly carried out, will stimulate miners to develop their prospects, many of which will undoubtedly become valuable mines. Mr. Geo. J. Rockwell, M. E., who is traveling in the interest of the company to investigate the mineral resources of the county and the feasibility of the establishment of such works, assures me of having ascertained that even with the imperfect development of the claims, that there is sufficient ore and of a character to supply the capacity of two mills of moderate size.

There are large possibilities in the future for the growth of an enterprise of this kind. What are now prospects may become mines, which will draw outside capital into our midst; the small mills will be increased as to capacity, a railroad may take the place of wagon-roads and burro-trails, and Yavapai county become a prosperous bullion producer. Wherever enterprise, capital and mining intelligence have been brought to bear, valuable properties have been the result. I will cite, for example, the Congress, the Hilleside and the United Verde mines.

JULES BAUMANN.

A VALUABLE INVENTION.—A new shaping-tool has been invented—a machine in which two flat surfaces, acting vertically or horizontally and moving in opposite directions, with adjustable dies fixed upon them, roll in one motion a piece of metal, regular or irregular in shape, and of almost any desired pattern. At a single stroke of the mechanism may be obtained a sphere, a cone, a chair screw, a bolt with thread and head—in fact, an endless variety of mechanical forms. We have already made mention of this device in these columns. It will no doubt prove of much practical value in the machine-shop.

IT is stated that nearly 5,000,000 persons in the United States depend for their living on the sale of liquor and tobacco.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

AMADOR GOLD MINE (LIMITED).—*Ledger*, July 27: About 80 men are employed, getting the mine in shape for the 60-stamp mill, and finishing the surface work necessary to start the mill. A force of men is at work on the mill reservoir and ditch for the 18-inch pipe to the mill; another crew is laying the pipe. The old hoisting works at the south shaft have been taken down, and the new works started.

CAVE IN PLYMOUTH CONSOLIDATED.—Plymouth met with another serious misfortune this week. On Tuesday a large cave occurred in the Pacific or Plymouth Consolidated mine—the mainstay of the town. It is of such extent as to cause the stoppage of the mill, and the discharge of about 50 men—in fact nearly all the employes. We understand it was the intention, had the cave not taken place, to close the mill for a time and go to sinking. In this case, a long period of idleness is probable. The Keystone is being surveyed by surveyors from San Francisco. They have surveyed all below the 800-foot level. The forty stamps are dropping in their old way, and to all appearances the Keystone is moving up to her former gold-producing position. The South Spring Hill repaired the shaft on Monday, and placed a line of air pipes to ventilate the mine. W. A. Nevills of San Francisco came up to endeavor to adjust matters concerning the Moore mine. It is rumored that he will soon start up the Big Tunnel and Moore properties. The expected sale of the Mahoney mine at Sutter Creek to the Wildman Company has fallen through, so it is reported in Sutter Creek.

Butte.

GOLDEN GATE MINE.—Chico *Enterprise*, July 21: The building of the flume and dam on the Golden Gate mine is progressing finely. About 150 men are employed night and day, and the company expects to commence mining operations in about four weeks. The water is now backed up 30 feet at the dam, and two miles up the river the capacity of the river is about 100,000 inches, which is a vast volume of water to contend with. This company deserves great credit for this undertaking, and if all pans out well river mining on the Feather will receive its share of capital now being invested by English and American syndicates.

RICH STRIKE.—Chico *Enterprise*, July 27: J. R. Lightford came down from the hills to-day, bringing with him a bottle of fine specimens from a ledge which he has just discovered in the mountains above Inskip, at the head of Philbrook valley. The specimens will go at least $500 to the ton. A company has been formed to work the mine. The elevation of this mine is about 6000 feet.

El Dorado.

GRAVEL CLAIM.—Georgetown *Gazette*, July 23: Dave Fraser, the old-time miner, who is now drifting in a gravel claim on Cement Hill above Georgia Slide, has presented us with some curious specimens known as petrified wood, but unlike any we have seen. They are in part wood in a state of decay, but mostly composed of massy and heavy sheets of pyrites which have replaced a portion of the wood. They were taken from near the bedrock, beneath a depth of 300 feet of cement and volcanic ash. Mr. Fraser is drifting through a tunnel several hundred feet in length and meets with logs, both rotten and sound, as well as that which is mineralized, and he meets with roots and stumps in place where they had grown. Some are the mountain laurel. The material in which this wood is imbedded is a hard cement, once a soft sediment. Beneath this lies the gravel in the bed of an ancient ravine where the gold is found.

Mariposa.

POCKETS. — Mariposa *News*, July 27: Two pockets have been taken out recently in the Storey mine at the head of Missouri gulch which was found under the Malone reservoir, that supplied water to miners in early days. One was taken out last week which probably amounted to $2000; another was taken out Wednesday, which may yield $1000, but no accurate estimate can be made. Though it has the appearance of a "blanket" vein, it is very wide, probably 30 feet, and fully six feet is rich milling ore. It may develop into one of the best mines on the grant.

Nevada.

ANOTHER ELEVATOR MINE. — *Transcript*, July 23: Supt. Miller is getting ready to work by the elevator process the French Corral placer mine opposite Darneal Bros.' store. Many years ago the gravel there was worked by the aid of stamp-mills and paid large profits, and then the lead was lost, to be rediscovered subsequently. An area of it about 800 feet long and 80 feet in width remains unworked. The present plan is to hydraulic it, and the debris will be raised 45 feet through a perpendicular pipe and deposited in a pit where it will be effectually restrained from running into and polluting the waters of the South Yuba river. Heretofore, in working by the elevator process, the pipe that raises the debris has been put on an incline; but it has been recently demonstrated that there is less friction and consequently better service with a perpendicular pipe.

CROWN POINT MINE.—Grass Valley *Union*, July 27: An important development was made in the Crown Point mine on Saturday, in opening up a vein 4½ feet in width in the southeast drift on the 180-foot level 540 feet from the shaft. Drifting had been going on for a long time in that direction on a small vein following the footwall, until it was finally determined to make a crosscut, and in a distance of nine feet the large vein here spoken of was cut into. The quartz shows well in galena and sulphurets, and is considered the most important find made in the mine in several years, and gives the promise of reviving the reputation that the mine had two years ago, when some very rich rock was taken out.

PROFITABLE POCKET MINING.—*Transcript*, July 27: D. W. Lord, who recently celebrated his seventieth birthday, and his partner, Mr. Curry, have recently had good success pocket-mining on Red Hill, two miles west of this city. Week before last they cleaned up $402.50, and last week did still better. In one day they realized $160 as a reward for their labor. Red Hill has long been famous as a pocket-mining region. Thousands of dollars have been found there by various prospectors, some of whom have got big returns. There is probably more gold left in the hill than was ever taken out.

COE MINE.—Grass Valley *Union*, July 25: The water in the Coe mine has been lowered to the 400-foot level, and the drifts repaired, and everything is ready awaiting the visit of Mr. Craig, the lessee of the property, who is looked for daily to make arrangements for the starting of regular underground work.

Placer.

PICK AND SHOVEL.—*Herald*, July 27: Good ore has been struck in the Pioneer mine. W. H. Bellows and J. Rathborn of Dutch Flat have bought the Lost Camp mine, near Blue canyon, and are preparing to drift. Parties are putting up a quartz-mill on the old Red Stone ledge above Blue canyon At the Hogsback they have sunk over 250 feet, and drifted across the channel. They have ascertained from sinking that the new tunnel will have to be at least 300 feet below the tunnel run last year. The 10 extra stamps have been put in the Hathaway mine, and would have been started last week, but were not, as the tappets were too small. Hon. C. F. Reed has purchased the Drummond quartz mine of J. B. Hobson, and has 10 men at work on it. This ledge prospects well and is of unusual width, being in some places 29 feet wide. Mr. Reed is now stoping out and intends to increase the force of men as soon as space will permit. He will soon have a Huntington mill in operation for testing the ore as it is taken out. J. B. Hobson informs us that the channel at the Red Point mine is now opened a distance of 1200 feet, and is paying big. The Boston Bar Co. will resume mining in the Middle Fork as soon as water can be obtained from the California Water Co. sufficient to run a hydraulic elevator. The Big Oak Flat Co. is preparing to extend its tunnel, which is now 100 feet in length. Good prospects have been found and the company has strong hope of striking it big. Luke Ferguson has taken out some very rich ore from the Kirkland mine, which he has sent to New York, whence it will be sent to Europe to be tested. D. Feliz is taking out some good ore from his quartz mine in Bear valley.

MAYFLOWER.—Placer *Argus*, July 23: Anthony Clark has sold the Orino claim at Bath to the Mayflower Co. The Live Oak tunnel is so near the Mayflower mill that they may readily use it when anything occurs that will give them time. The Mayflower has ground opened sufficient to occupy the mill and additional stamps for months to come. The Horman mine at Wisconsin Hill is now employing about 20 men, all white. The new air-shaft is about completed, and the work on the mill progressing finely, although the material is arriving rather slowly. Dan Wickman of Placerville is the master mechanic. A boarding-house 20x52 feet and a lodging-house 20x36 feet are already erected. The boiler and compressor are in position, and pipe laid to the face of the tunnel. They intend starting the Burleighs soon.

Plumas.

TO THE FRONT AGAIN.—Plumas *National*, July 27: Plumas is coming to the front again as a mining county, and from the present indications in different parts we seem to be on the eve of a mining boom. Information comes that there is quite a stir in the Spanish Ranch mining district. There are several good mines in this locality which have been shut down for some time, and our patient prospectors have lately brought to light several new mines which promise well. There have been several parties making very thorough examinations of some of the mines with the view of purchasing. The Megown is liable to change hands soon, at least there are negotiations pending for putting up a mill on the mine for working. It still continues rich. The boys panned out several $30 pans of dirt last week. The Edman, which has been bonded for some time, and which has also been in litigation, was examined last week by some capitalists, who express themselves as being much pleased with the property, and it is likely to change hands at any time, and then a big plant will be put up. Mr. J. H. White of Oakland has been up to examine the mine owned by the Shenandoah Quartz M. Co., at French ravine on the East branch. Mr. White told a gentleman at Spanish Ranch that he had taken an assayer with him to the mine and the results of the assays were sufficient to justify putting up a plant on the property. W. E. Duncan, Esq., of the Banner near Oroville, has purchased all of the mining property of A. H. Brooks, on Rush creek flat, and will get a patent for it. He was up last week accompanied by a Mr. Low of San Francisco, who made an examination of the Hallstéd. He took a large quantity of the ore below with him and intends having a careful assay made. Pete Lorenzo picked up a $400 nugget last week in the Squirrel creek claim west of Johnsville. The Plumas Eureka is looking splendid and promises to go on paying the handsome dividends it has in the past. The outlook now for the Johnsville country as a mining district is very bright. The Jones Bros. mine, the Squirrel creek claims and Little Jamison are all good pieces of property, and that part of the county will be booming soon. Benj. Jones of the celebrated Jones mine went over to Rush Creek this week to examine the Moore Owens ledge, and we are informed that he was very much pleased with it.

Shasta.

CHROME.—Redding *Free Press*, July 27: Shipments of chrome ore are now being made from Chromite station, three miles below Sims, to Baltimore, Maryland. The mine producing this ore, we understand, is the property of Clay W. Taylor and Sylvester Hull. A couple of gentlemen have leased the mine under contract to take out 3000 tons of ore, with the privilege of raising it to 5000 tons, paying a royalty of $2.50 a ton.

Sierra.

KANAKA.—Cor. *Mountain Messenger:* The new tunnel which is being run to tap the Old Kanaka lode was started April 2d and is in 350 feet, and an air shaft of 25 feet to the surface is just completed, with fire-blast connected with iron pipe leading to the face of the tunnel, and gives perfect ventilation. Recently several stringers of quartz have been crossed; the last one is five inches wide. Patten says it will go $75 per ton in gold, all of them prospected accompanied by arsenical sulphurets and iron pyrites. Since the commencement of the tunnel it has progressed systematically. The amount of work accomplished reflects great credit on Mr. Patten's management as foreman. He also has coworkers—the two Fortier Bros. and Mr. Gill. The great importance of this mining enterprise doubtless centers upon the back ledge. The tunnel, after cutting the front ledge and thoroughly developing its paying value, will be driven ahead some 300 to 400 feet into the mountain, giving an estimated vertical of 500 feet to croppings, called the back ledge, the croppings of which were sunk on and tapped by tunnel giving a back of some 70 feet, showing very nearly a continuous chute of some 600 feet in length carrying free gold and several minerals combined in the rock. Most of the ore as far as developed is of high grade.

BUTTES SADDLE MINE.—Sierra *Tribune*, July 26: There have been filed with the Secretary of State articles of incorporation of the Buttes Saddle G. M. Co. of this place. Capital stock, $500,000. Directors—Martinez Gutierrez, Wm. Swan, G. Shotter, C. Zaney and F. J. Seitz. This mine is situated directly on top of the Buttes mountain which faces Sierra City, and is about three-fourths of a mile in a straight line from town. There is no better location for a quartz mine in the district than this is. There are three different ledges which, at a distance of about 400 feet, come together and make one solid ledge. The smallest of the three ledges is seven feet, and where they verge into one it is all of 30 feet wide, as far as can be learned. The ledge is a true fissure vein and cuts the country rock. There is no part of it but where can be found plenty of free gold, and it all prospects well. At present six men are engaged in running a tunnel on one of the forks of the ledge, and are taking out some of the quartz which is revealed as they go along.

THE CALIFORNIA MINE. — Sierra *Tribune*, July 27: The California Con. M. Co., whose mine is situated about 1¼ miles above town on the south side of the river, finished the erection of their five-stamp mill last week and started two of them up last Friday. The plates are said to be looking well thus far, and a good cleanup is sure to be made. The California is owned by residents of Sierra City.

QUARTZ.—*Mountain Messenger*, July 27: A rich quartz strike was made last week at the Bedrock ledge, owned by William and Richard Phillips, near Pike City.

Trinity.

EAST FORK.—Trinity *Journal*, July 27: We first examined the group owned by Junkans & Co., named the Little Chief, Linney and North Star. This group will prove a valuable property. A good deal of work has been done in the way of development, running tunnels, inclines, etc., and the property shows well. In the North Star tunnel the ledge is four feet in width, is well defined, and has all the indications that, to a miner's eye, denote permanency. The ore is of fair grade and the crushings have been satisfactory. There is a little prospecting mill running on the ore which will probably be replaced before fall by a 10-stamp mill. Above the North Star is the Crown Point, owned by Harthen, Durkes, Bergin & Laws. A good deal of work has been done on this mine. The ledge runs from eight inches to two feet in width, and is good milling rock. The walls of granite and porphyry are well defined. The ore carries free gold and sulphurets. Samples crushed at the Selby Smelting Works went $38 to the ton in gold and $1.70 in silver. Their shaft cuts the Effie G., a continuation of the Crown Point. Leaving the North Star mines, we passed down the road to the Enterprise, owned by Balch, Day, Leavitt & Lobdell, The Enterprise has been, for the past two years, the best paying property in camp. The ore has averaged $100 to the ton when crushed by arastra. The company have done a large amount of development work and are now engaged in putting up a fine 10-stamp mill. On the opposite side of the creek are the Poorman and Sunny Side mines, on which considerable prospect work has been done, and which show strong ledges of very good ore. On the same side as the Enterprise is the Fritz, which carries a very good vein of ore. Following up the wagon-road about a mile, we came to the Yellowstone mines, owned by the Niagara Mill & Mining Co. The company have a great many locations in this vicinity and have done a large amount of work on them. The rock taken out is crushed by an arastra. These mines are reported sold to a German syndicate. About eight miles above these mines on the East Branch is the Golden Chest mine, owned by a San Francisco company, on which is a fine five-stamp mill with concentrators, rock-breakers, etc. Owing to litigation, work is suspended. About three-fourths of a mile above the Golden Chest is the Red, White and Blue, owned by Kroumpe & Stiller. The ledge is eight feet wide, carries free gold and sulphurets and looks well. The ledge shows up well and the ore is of good quality; two sacks of ore sent below for a working test went $60 to the ton. In this vicinity are a number of locations on which prospect work has been done. There is another group of mines between East Branch and Yellow Jacket creek. The mines are situated in a strip of country four miles long; they look well. The Davis Bros. have a number of locations all showing quartz prospects; they have run a tunnel in on one ledge 115 feet and found $40 rock. Three miles above them Nicol, Zuello & Junkans are working their ledge; they have run in a tunnel tapping the ledge at a depth of 50 feet and are now drifting on the ledge, which is five feet wide and prospects well. This section is full of ledges. Hubbard and Given have an eight-foot ledge joining Davis Bros. that prospects well; not much work has been done on it, however. About five miles above North Fork on the right-hand side of East Fork are a cluster of mines on Barney and Rich gulches that offer fine inducements for a syndicate to handle. They are favorably situated to be worked by one company and deserve the consideration of capitalists. A branch wagon-road leaves the main road at the Creek and winds up the mountain above the mill to the Thanksgiving mine. Peterson & Co. have nearly completed their mill and will soon begin crushing ore from the Fountain Head and Thanksgiving. The mill is a fine one, has all the modern improvements and can crush 25 tons a day. On the Barney gulch side are the following mines: Arkansas, Star, Orland, Saturday Night, Belle, Web-foot, Violet, and Grizzly. These are all owned by responsible parties, and on most of them considerable work has been done. All have ledges carrying free gold and most of them sulphurets. On the Rich gulch side are the Lobdell ocations, Hardscrabble and the Ozark, owned by Day & Greenwell, one of the finest properties in the district. The ore averages $100 a ton and the tunnels have opened up a large body of it. An arastra is running on the mine.

SURVEY.—The superintendent of the Altoona quicksilver mines is contemplating making a survey of a trail from Sims, Shasta county, across country to the mine, for purposes of quicksilver transportation. The present shipping distance to rail is 70 miles, and the proposed trail will cut off at least 50 miles.

Tuolumne.

CHINESE CAMP. — *Independent*, July 27: The work at Moffit's mine is progressing rapidly. A full force of men is engaged constructing the works. The water is at a very low stage.

MARY ELLEN.—Another shoot of rich rock was discovered in the Mary Ellen mine, last week, in the upper tunnel. The vein is now 2¾ feet wide and shows gold freely. The mill will be ready to run inside of 30 days.

Ventura.

THE PIRU MINE.—Cor. Ventura *Vidette*, July 27: The Piru mining district seems to be slowly but surely coming to the front. Work on different prospects is advancing and the attention of capitalists and mining men is being attracted to the district. A good portion of the country has never been thoroughly prospected, and, judging from what has been discovered, other rich discoveries may be made. That a bright future is before the Piru district is undoubted. The mineral belt is a large one and in this is included the Alamo, Fraser and Pinos mountains. Fraser mountain has been the most thoroughly prospected, and seems to be a large mountain of mineral only awaiting capital to develop it. Although very rich ore has been found, most of the ore is low grade and there are vast quantities of it. And this low-grade ore is what will some day cause the Piru district to rank as one of the richest mining districts on the Pacific Coast. The White Mule mine has been bonded to a Los Angeles syndicate for $10,000. Two or three handsome offers have been made for an interest in the Little Daisy, but the owners, realizing that they have a good thing that will keep, are in no hurry to sell and are not jumping at every chance.

NEVADA.

Washoe District.

CROWN POINT. — Virginia *Enterprise*, July 27: The raise from the 350 level is in vein material of a favorable character. The 300 level south drift has advanced a total distance of 75 feet. The face is in quartz yielding good assays. The 700 level south drift advanced 30 feet, making its total length 105 feet south of No. 1 crosscut. The drift shows no change for the week. The raise from the 400 level has been connected with the old 300 level stopes.

CON. IMPERIAL.—The face of the north drift on the 300 level is in a promising character of vein material. The joint Challenge, Confidence and Imperial north drift on the 500 level is in 820 feet from the Yellow Jacket shaft, 20 feet having been added during the week. The face is still in quartz giving low assays.

HALE & NORCROSS.—The north drift on the 300 level is out 261 feet. On the 400 level the north upraise is now advanced 52 feet. The top of this upraise continues in good ore, and are now putting square sets in on this ore.

CHALLENGE CON. — The joint Confidence-Challenge-Imperial north drift on the 500 level is now in 820 feet from the Yellow Jacket shaft, having been advanced 20 feet during the week. Face shows quartz giving low assays.

CON. CAL. & VA.—The usual quantity and grade of ore is being extracted from the various openings on the 1400, 1435, 1500, 1600, 1650 and 1950 levels. The average assay of the ore extracted will be about the same as last week.

BELCHER.—The winze below the 1000 level is still in quartz carrying some metal. The south drift on the 1000 level is passing through quartz of excellent grain and appearance which is beginning to give low assays.

OCCIDENTAL.—The usual prospecting work has been done on the 300 level. Are stoping ore on the 350 and 400 levels. Ore is also being extracted on the 450 level. The mill is about ready to be started up.

SAVAGE.—On the 500 level the drift from the upraise is now advanced 107 feet. Men are engaged in bulkheading and retimbering in the main shaft and on the different levels.

SILVER HILL.—Usual progress made in advancing the 800 level northwest drift and the northeast drift. The raise above the southeast drift is still in porphyry.

CHOLLAR.—The usual prospecting work is being done on the 650, 750 and 850 levels. On the 650 is found quartz carrying some metal.

POTOSI.—The 750 level south drift is out 561 feet, in porphyry and quartz. The 550 level west crosscut is in clay and porphyry.

NEW YORK CON.—The upraise above the 800 level west crosscut is showing a breadth of four feet of ore assaying $35 per ton.

NORTH OCCIDENTAL. — The usual prospecting work is being done on the 300 and 350 levels. No change of material.

SEG. BELCHER.—The south drift on the 1100 level is in a mixture of quartz and porphyry that promises ore.

JUSTICE. — Shipped 200 tons of ore to the mill, showing a value of above $28 from battery sample assays.

ALTA —The usual amount and grade of ore is being crushed. The 927 level stopes show an improvement.

GOULD & CURRY.—The usual prospecting work is being done on the 300 and 400 levels.

MEXICAN.—The west crosscut on the 1465 level is in quartz that carries some metal.

BALTIMORE.—Working as usual on the 338 and 225 levels. Some ore being saved.

BULLION.—Still exploring the 760 level quartz belt. No change in the formation.

UTAH.—On the 600 level the south drift is in a favorable mixture of quartz, clay and porphyry.

West crosscut No. 3, 60 feet south of the upraise, was advanced 40 feet and cut the west wall.

UNION CON.—North drift on 1485 level still in promising vein material.

SIERRA NEVADA.—The east drift on the 520 level is still wet at the face.

OVERMAN.—Making repairs to drifts and extracting small lots of ore.

ALPHA.—The 500 level west crosscut is showing streaks of quartz.

ANDES.—Still sinking the winze below the 300 level in quartz.

OPHIR.—The upraise from the 1465 level is still in porphyry.

SCORPION.—The joint east drift is out 860 feet.

CONFIDENCE.—The same as Challenge Con.

Cherry Creek District.

GOOD REPORTS.—White Pine *News*, July 27: The mining reports that reach us from Cherry Creek are of a flattering nature. The Merrimac Co. is working 35 men and the ore in the mine is said to be showing up better than ever.

Mount Rose District.

THE RUSSELL PROCESS.—*Silver State*, July 30: Supt. McCurdy of the Paradise Valley mine thinks of putting up a plant to work ores by the Russell process near the company's reduction works on Martin creek. There are some 30,000 tons of tailings on the ground which will average $10 or $12 per ton by that process.

Osceola District.

DRY PLACERS.—White Pine *News*, July 27: Mr. Reeder's father has struck some rich placers on his ground there, which is paying handsomely by the dry-washing process.

Tuscarora District.

DEL MONTE.—*Times-Review*, July 27: North drift 225-foot level extended 10 feet showing some low-grade ore. Upraise near the face carried up 15 feet. Joint crosscut, same level, extended 17 feet, face looking favorable.

COMMONWEALTH.—Drift from No. 11 upraise has been advanced 13 feet and connected with west stopes, exposing fine ore the entire distance. The ore is developing well going east from the same point. North drift from square sets extended 35 feet, showing some fine ore. Stopes above are yielding high-grade ore. South stopes, from this point, are as good as any time heretofore. No. 7 stopes are developing well.

NEVADA QUEEN.—Winze from 450-foot level has been sunk four feet; total, 71 feet. The ore continues to show as well as in part of winze above, assaying from $30 to $360 per ton. Two hundred and eighty tons of ore have been sent to the concentrator, which is running all right.

NAVAJO.—South drift on west vein, 350-foot level, extended 13 feet. West crosscut from south drift on east vein, same level, extended 14 feet, cutting through seams of high-grade ore. Upraise, same level, extended 10 feet, continuing to show some high-grade ore.

BELLE ISLE.—West crosscut from the end of the north drift 250-foot level extended 11 feet. North drift 150-foot level extended 10 feet.

GRAND PRIZE.—Stopes are furnishing the usual amount of ore. Other work at the mine and concentrator is progressing favorably.

NORTH BELLE ISLE.—Work has been suspended below the 400-foot level preparatory to sinking the shaft.

ARIZONA.

ARIZONA COPPER CO.—Clifton *Clarion*, July 24: Two furnaces are kept constantly running by this company, and it is reported that they are now producing more copper and at less cost than at any time in the history of the corporation. The management of the different departments of the concern is now in most capable hands, to which fact may be attributed the very satisfactory manner in which operations are carried on. Three of the four furnaces have now been fitted up with large brick stacks. The remaining one will be similarly arranged. Superintendent of Smelters Colquhoun reports that the large chimneys are a great improvement over the old iron ones, the furnaces smelting a much larger proportion of their own flue dust. The large amount of flue dust which has accumulated and been piled up near the smelters—in quantity about 4000 tons—is being smelted at the rate of 13 tons daily. This dust runs from 8½ to 12 per cent copper. It is said that Sup't of Mines Ferrie has under consideration the advisability of putting in a hoisting-engine at the Longfellow for raising the concentrates, the work having reached such a depth that the horse whim is entirely too slow. The mines of the company being worked are reported to be looking well, and generally there is nothing in the outlook of a discouraging nature, but, on the contrary, the indications point to a very successful year for the A. C. Co., with probably an increased output over 1888.

UNITED VERDE.—Prescott *Courier*, July 23: Edward L. Preston, from Jerome, is in Prescott on business for A. W. Clark, lessee of the United Verde mines and smelters. Two furnaces are constantly kept running and the mines are doing well. Some 60 men—miners, furnace-men and wood-choppers—are making good wages. Heavy rains have injured the road, but the freight contractor, E. H. Witherell, has 20 men repairing damages and is hauling coke and bullion. Mr. Culver's teams are constantly arriving in Prescott with shipping ore from the Congress mine. The 20-stamp mill will soon be completed. The Catoctin mine is producing plenty of shipping ore. Mr. Liston, owner of the old Reliable mine, has, at his rooms, pieces of gold quartz that give one a good idea of the great wealth of our veins. The old Reliable is opened to a depth of about 120 feet, by shaft. There are several other openings in it but the one above is the deepest. The vein is fully three feet wide. He has worked 230 tons of it without any assorting whatever, and it yielded in the neighborhood of $37 per ton, gold. Mine-owners of Tonto Basin will soon have a mill to work their ores.

BRITISH COLUMBIA.

KOOTENAY.—Cor. Kootenay *Star*, July 25: There is no better field for capitalists to invest their money than in Kootenay districts east and west. Nearly all of the prospects will pay from the grass roots, especially at Toad Mountain, Kootenay lake, Spilemacheen, Toby creek, Windermere, Illecillewaet and McMurdo districts, and I can safely predict that when the mines of Kootenay district alone are developed, the eastern half of British Columbia will become one vast and flourishing mining camp.

ILLECILLEWAET.—John Maher has six men at work driving a tunnel; he is in 77 feet. D. Woolsey for Cariboo Creek M. Co., has six men sinking a shaft; he is down about 50 feet in an immense body of low-grade ore. Boyd, Bain & Co. are keeping the drills polished at Fish creek; they certainly have the best prospect in the camp.

COPPER CREEK.—By the sound of explosives, G. McCabe must be rushing things on the Southern Cross. He has two shifts of men at work and expects to increase this force at an early date. The property is of the nature of steel galena. The pay chute is about four feet wide but getting wider with every foot of depth gained.

DONALD.—The Porcupine placer miners are in with a nice lot of coarse gold. Placer seems to pay in that locality. G. B. Nagle's discovery claim seems to pay nicely. Nagle & Horn, who left here a short time ago, are prospecting in the McMurdo district, where they intend remaining awhile.

COLORADO.

LEADVILLE.—*Tribune-Republican*, July 25: With all that has been said about the wealth of Aspen, the fact still remains that it cannot near equal Leadville in point of production in tons and value of ore. Such a property as the A. Y. and Minnie with its $11,000,000 in sight and the Henrietta-Maid producing at the rate of 7000 tons per month, is enough to make the camp great. But there is the Continental Chief, which is now netting its owners $100,000 a month, and a score of other mines doing well. Even the "played-out" Little Pittsburg is sending better than $100 ore to market, which is found in virgin ground. Long and Derry hill is once more active, and as considerable ore is found, it is within the line of possibilities that a great mine may yet be discovered in that particular locality. There is not a mining engineer of note in the carbonate camp that is not watching developments in the locality closely. "To tell the exact truth," said a well-known Leadville mining man to a *Republican* representative, "the California mining district is better to-day than it ever was. In tonnage it may not be quite as large, but I am convinced that this is more than made up in value. Some people say that the town is dull and that as a place for business in a mercantile way it is no good. Why don't they read between the lines? Prospecting on each 300 feet of ground is a thing of the past. A shaft or a claim in a fault is no good. Ore shoots are now almost as clearly defined as the bed of a river. Sometimes they are near the surface and again they are very deep, and water by the millions of gallons must be fought. But if the money holds out the vein is found. On most of the hills the question is as closely determined as this, but there are a few localities where luck is the only guiding star."

DAKOTA.

TO TREAT REFRACTORY ORES.—Black Hills *Pioneer*, July 27: Though not generally known, it is nevertheless a fact that experiments are now being made in no less than six different cities outside of the Hills, having in end a solution of what was until recently a harder problem than many in differential calculus—the treatment of Ruby Basin and Bald Mountain refractory ores. We say until recently because the solution has already been found in the Newberry-Vautin method. The Hills, however, have no reason to complain, but should rather rejoice in the fact that the experiments are being made. The more ways found to treat the ores, the better it will be for the country. Constant effort should ultimately produce at least some economy. Another reason for congratulation is that so many different parties should be interested in finding a method. None of these at whose instance tests spoken of are now being made, are resident here. They are, however, owners of property at either Ruby or Bald Mountain, and are men of means. If experiments at St. Louis now under way meet a happy result, it means the bringing of immense capital here within a few months. The same effect may be expected from satisfactory results at other places. In the meanwhile, however, we have the Newberry-Vautin and dry smelting processes, both applicable and either economical.

UNCLE SAM.—Deadwood *Pioneer*, July 29: News reaches Deadwood that 20 stamps in the Uncle Sam mill have resumed ore crushing. Whether the run is to be temporary or permanent is not stated. It is hoped and believed, however, that the run will be continuous.

IRON HILL.—Ore hauling from mine to smelter begins next week, which would indicate the plant will be blown in at an early date. The run will be a short one, however, and is not expected to last more than 10 or 12 days. Official advices are, that though the size of the rich ore deposit has been greatly magnified by the public, the mine is developing most satisfactorily.

IDAHO.

NEW PLACER DISCOVERIES.—*World*, July 23: George Ainslie last Saturday sent the *World* extracts from letters received by Hon. A. F. Parker, from Lewiston, Idaho, as follows: "The Warrens expressman brought out news of a rich placer find discovered by 'Three-fingered' Smith and two others, 30 miles beyond Alton district, said to surpass Warrens in its earliest days, both in extent and richness. Specimens of $1 were found in numbers. Warrens is deserted. Everybody going to the new El Dorado. A party of 12 started from Grangeville. Chinese pack horses are being hired at Warrens at $15 per head to ride into the mines."

SAWTOOTH.—Ketchum *Keystone*, July 27: Five cars loaded with ore from the Silver King mine at Sawtooth were shipped from the Ketchum depot yesterday, consigned to the Grant reduction works at Omaha. Three of the cars aggregated 50,000 pounds in weight. A lot of ore from the Warrior mine on Warm Springs creek was sampled at the Ketchum sampling works during the week, which yielded at the rate of 120 ounces silver and 58½ per cent lead per ton. The strike in the Senate mine at Galena is of great importance. The discovery was made 21 feet below the lowest level, where the existence of any ore has never been suspected in past years. The ore seam at the bottom of the winze is 10 inches thick, and the ore will average over 65 per cent lead. Work has been started on the Little Chief mine. Some $14,000 was taken out of one pocket in this property, and much ore is still showing in the workings. Woods & Pearson's pack train are busy packing ore for Ole Opeland and others, lessees of the Parnell mine on the East Fork of the Salmon river.

COEUR D'ALENE.—Wardner *News*, July 20: Every day brings fresh arrivals, and those who have traveled near and far have no hesitancy in pronouncing Wardner the greatest mining center they have seen. The words of promise that we daily hear augur well. The other railroad—W. & I.—is coming, capitalists are coming, mining men are coming, and every one is coming to Wardner. The *News* will soon inform its many readers of the building of a 400-ton concentrator for the Bunker Hill & Sullivan Co., when they will need the services of 300 miners, teamsters and other workmen in their daily operations, and when the exclusive use of one line of railroad will be tested in transporting their product of ore. The future movements of the Bunker Hill & Sullivan Co. are grand in conception, perfect in detail and on a par with the magnitude of the mines under its control.

YREKA DISTRICT.—Notes of preparation are heard at the Emma & Last Chance concentrator, and the preparatory steps for the enlargement of the mill have been taken. The machinery has commenced to arrive, and the Pelton water-wheel is already on the ground. The massive water-pipe, manufactured by Holly, Mason, Marks & Co., is being put together, and when in place will be 600 feet in length. The work of grading the site for the addition to the building will be commenced on Tuesday, and no time will be lost in its erection. When finished, the capacity of the mill will be 120 tons per day.

MONTANA.

QUIET.—*Inter-Mountain*, July 27: The past week has been a very quiet one in mining circles and little has been doing. There has been the usual crop of rumors, the leading one of which is to the effect that the Anaconda Co. is to be made a stock company. At present the company has no corporate existence. It is also reported that the company has had engineers looking over the Great Falls, with a view to the possible location of a refining plant there. The latter plan is considered a very remote possibility; so remote, in fact, as to be almost an impossibility. Both reports are mere rumors, and no definite foundation can be found for them. Workmen are busily engaged at the Silver Bow shaft of the Butte & Boston Co. putting a station at the 300, and getting ready to sink to the 400.

NEW YORK GULCH.—Anaconda *Review*, July 25: This gulch, which is located in a northeasterly direction from Helena, in Meagher county, is once more coming to the front as a prosperous mining camp. The Trout creek placers are making a good showing. About 100 men are at work and are well pleased with the favorable results.

THE SOUTHERN CROSS.—The Southern Cross mine is now fast approaching the condition of development which Calvin H. Hand, the company's expert, pronounces all that is necessary to justify the erection of a big free-gold mill upon the property. The plan, it is understood, is to build a 50-stamp mill, and to sink a working shaft about 150 feet up the hill from the vein. This sunk vertically will cut the vein at a depth of from 350 to 400 feet. The prospecting shaft (incline) is 250 feet deep, and the vein has been opened by levels, both east and west, at depths of 85, 150 and 260 feet, the levels extending east about 100 feet and west over 125 feet. An upraise to the surface has also been made from the 150-foot level from a point 105 feet from the shaft. When it is stated that these developments are all in good ore and that the average width is between 15 and 20 feet, it will be readily understood that an immense quantity of ore is in sight—30,000 or 40,000 tons at least. The average assay value of the ore is about $12, though there are some bodies of considerable magnitude exposed which will average over $20 per ton. The company's expert says the gold can be saved in a free-mill to about 75 per cent of its assay value with proper care.

NEW MEXICO.

PRODUCING MINES.—Rio Grande *Republican*, July 26: The mines of the Organ mountains continue to produce a small quota of ore. This week cars were loaded from four different mines at the Las Cruces depot with ore rich enough to offer inducements to capital. About a dozen mines pay in a small way, which, if the owners had means to develop their resources properly, would be valuable properties. Below we give a list of those being worked.

LITTLE BUCK.—This mine has been worked for six years off and on, mostly under the lease system. Elijah Davis has a lease now on the east end and is getting out some high-grade ore. With the exception of the Bennett and Stephenson it ranks as the largest producer in the camp, having added over $30,000 to the world's wealth.

GREY EAGLE.—The Grey Eagle has produced rich ore in small quantities for a number of years, but only pockets, which were soon exhausted, were found. It is now reported that Mr. Steubenrauch, who is working the property, has discovered the vein and that bids fair to be a regular source of supply from this time on.

GIRARD.—This property belongs to the Philadelphia Company, managed by W. H. Skidmore. It is being worked under lease by Lew Cowan, and a carload shipment was made this week to Pueblo.

DOS AMIGOS.—This mine is being worked under lease by Younger and Barlen. They have a streak of heavy galena that runs away up in silver.

MODOC.—A shipment of a carload of sulphate ore was made this week to El Paso. A recent analysis shows that it runs about 30 per cent lead, between 5 and 10 ounces in silver and 20 per cent iron.

BENNETT.—The ore in the Bennett for a time, at a depth of about 250 feet, ran so low that it barely left a margin for a leaser, but now, to the satisfaction of all concerned, the grade in silver is increasing with depth, and it pays handsomely.

EUREKA.—This is the old Crescent City which has been making shipments for a number of years. There is more ore now in sight and a better body than the mine has ever before shown.

TOUGHNUT.—Edward Burt and A. A. McLaughlin are sinking on the Toughnut, paying expenses with the ore as the shaft goes down.

OREGON.

ANOTHER RICH FIND.—Bedrock *Democrat*, July 22: The old mining camp of Robinsonville, about 50 miles southwest of Baker City, is the center of a mineral belt extending for miles in every direction. Both quartz and placer mines have been worked for years with the most gratifying results. Near the Red Man mine, about a quarter of a mile from Robinsonville, has been made what promises to be one of the richest strikes ever discovered in Eastern Oregon. The discovery was made by Mr. J. H. Mitchell on the 12th day of August, 1888, who immediately located it, but deferred development work until about four weeks ago. The development work as yet is somewhat limited, the shaft being only 30 feet deep. The ledge is true, well defined, and is two feet wide. The ore is classed as red carbonate and carries free gold. Mr. Mitchell has taken out 10 or 12 tons of ore which he intends sending away for reduction. The mother rock, or croppings, will assay $50 per ton, and the farther down he goes the richer the ore. The specimens which are now on exhibition at Durkee & Dill's are the finest that have been brought to this city in many a day. The rock is full of wire gold which is plainly visible to the naked eye.

COAL DISCOVERIES.—Albany *Herald-Disseminator*, July 25: Wm. McKinnon, who lives up the South Santiam several miles above Sweet Home, about 45 miles from Albany, has made what seems destined to prove a valuable coal discovery. The coal deposit, which has only been opened a few feet below the surface, is in Canyon creek, and gives evidence of being an enormous vein. Mr. McKinnon, who runs a blacksmith-shop and is familiar with coal, says it is better than the average blacksmith's coal bought in the market, and he has recently been taking it out and using it in his forge. The deposit is situated about 500 yards from the main wagon-road, and Mr. McKinnon thinks it the most valuable coal discovery ever made in the Santiam region. Several coal deposits have been made in various places along the Santiam, but nothing that equals this in quantity or can excel it in quality.

SPARTA.—Bedrock *Democrat*, July 22: The mines in and about Sparta are looking well. The contractors have completed their 200-foot tunnel on the Big Pittsburg, and will now drift 100 feet on the ledge. Prospects encouraging. At the Blue Gulch mine the free gold pay chute has given out, and the richest and largest body of sulphurets ever encountered in this section is now being mined. The Winter mine, owned by Dr. A. Marrott, of Baker City, is said to be under a $50,000 bond to California parties.

POWDER RIVER is now very low and work at different places along the coarse gold streak, extending for a distance of ten miles, is being done with the most satisfactory results to the operators. Mr. Ferri, working on the claim of Jay Guy Lewis & Co., says the gravel is four feet deep to bedrock, carrying gold all the way down, and in one pan of pay dirt, fairly taken, over $5 were realized. The largest piece thus far found by Mr. Ferri weighed $6.75. The three companies of Chinese now working on Thorne gulch will commence working on Powder river as soon as their present cleanups are made.

UTAH.

TUNNELS.—*Park Record*, July 27: The first of the week a force of eight men was engaged by Smith Ehenger to clean out and re-timber the Silver Age and Minnesota tunnels situated on Pioneer ridge toward the head of Bonanza flat. The Silas Reed group of mines was developed by these tunnels, the former being in a distance of over 1200 feet and the latter about 900 feet, but no work has been done through these tunnels for two or three years. The large air compressor and blower for driving the Alliance's 4800-foot drain tunnel are in place and will soon be in working order.

OPERATIONS BY LEASERS.—The Wasatch leasers have thoroughly cleaned out the old workings with considerable difficulty and now they are opening up the vein in new ground. They have also stripped the vein in certain parts of the old workings and ere long this Bonanza property of Blue Ledge district will be shipping large lots of ore. The leasers of the Nevada and Northland are working three shifts and a horse whim. Already the shaft is down about 60 feet and the calculation is to go down 200 feet before drifting for the Woodside vein which undoubtedly runs through their ground as well as the Mayflower. The Mayflower No. 7 leasers' property is developing into a veritable bonanza and heavier shipments of high-grade smelting ore are made.

ABOUT THE ANCHOR.—Developments in the Anchor are forging ahead and the main force is at work in the south crosscut, and it is expected that the ledge will be encountered at any day.

WASHINGTON TERRITORY.

THE SILVER DUMP.—Ellensburg *Capital*, July 25: The owners of the Silver Dump No. 1 have incorporated, and propose pushing developments on their mine in Upper Cle-elum District. This mine was discovered in April, and is now being developed by a tunnel which is now in about 40 feet, tapping the ledge about 80 feet below discovery. The vein is about 60 feet between walls, and the ore assays from $80 to $120 in gold and silver. It also carries a considerable percentage in lead and copper. The new wagon-road to the mines of the Upper Cle-elum makes them easier of access, and will enable the Silver Dump Company to make some shipments this fall.

THE ARLINGTON MINING CO. of Ruby are making arrangements for the shipment of over 400 tons of mining machinery over the Ellensburg and Okanogan Steamboat line, and will begin shipments in a few days.

MECHANICAL PROGRESS.

Transmission of Heat Through Thick and Through Thin Plates.

There is a popular idea, even among experienced engineers, that the thickness of metal in a boiler has a decided effect on the rate of evaporation—thin metal transmitting the heat of the fire more rapidly than does a thicker material. For example, here is a statement taken from the catalogue of a well-known water-tube boiler:

"The thick plates necessarily used in ordinary boilers, in the furnace, not only hinder the transmission of heat to the water, but admit of overheating, and even burning the side next the fire, with consequent strains, resulting in loss of strength, cracks, and tendency to rupture. Water tubes, however, admit of thin envelopes for the water next the fire, with such ready transmission of heat that even the fiercest fire cannot overheat or injure the surface."

Another example of the same idea is found in one of the numerous technical "Catechisms" which are offered to engineers. It is as follows:

"The advantage of thin tubes is that the heat inside of them is conducted to the water outside more rapidly than it would be through thicker metal, which is important when combustion is so rapid as it is in locomotive boilers."

Of course, there must be some foundation for this idea, and it seems to be derived from Peclet's experiments, the law established by that experimenter being given in D. K. Clark's "Rules and Tables," as follows:

"The flow of heat which traverses an element in a unit of time is proportional to its surface, and to the difference of temperature of the two faces perpendicular to the direction of the flow, and is in the inverse ratio of the thickness of the element."

The foregoing quotations present, it is believed, a fair and full statement of the views entertained by the advocates of thin plates for boiler construction, with the authority for those views. It is now in order to give

The Other Side of the Question.

Peclet's experiments are ably discussed by Prof. Rankine, in his "Manual of the Steam Engine," and, as frequently happens in such cases, the reasoning of the latter has thrown new light upon the conclusions to be drawn from the experiments. After an analytical discussion of the subject, Prof. Rankine adds:

"The external thermal resistance of the metal plates of boiler flues and tubes, and other apparatus used for cooling and heating fluids, is so much greater than the internal thermal resistance, that the latter is inappreciable, in comparison, and consequently the nature and thickness of those plates has no appreciable effect on the rate of conduction through them."

Experimental proof is always valuable in the determination of any question, and, fortunately, such proof is available in the present case, the experimenter being Prof. Walter R. Johnson, well known as an experienced and careful observer. A work by Prof. Johnson, entitled "Notes on the Use of Anthracite in the Manufacture of Iron, with some Remarks on its Evaporating Power," contains the following passage:

"Mr. Parks lays considerable stress upon the thickness of metal of which a boiler is composed, as influencing the rate of evaporation, and also on the temperature of combustion, as affecting the durability of boilers. In regard to the former of these points, I may mention that my own experiments on iron of different thicknesses, from one fi tieth to one fourth of an inch, and those of Mr. Hayes, from one-eighth up to one inch, prove that within these limits, which are, in both directions, far beyond the requisitions of the steam boiler, no sensible difference will be produced in the evaporative effect of fuel And with respect to the second point, I would refer to the fact, first established by my experiments, published some years since in the *American Journal of Science*, and since reproduced both in England and in this country, that, so long as water is in contact with iron under atmospheric pressure, the metal will not receive a temperature much more than 100° Fahrenheit above the boiling point; for from 312° to 324° is reached the temperature of maximum vaporization—a rate of generating steam far beyond the practice even in locomotive engines." (It is to be noted that this was published in 1841)

The above quotations, to say the very least, throw considerable doubt upon the positive statements about the effect of thick plates, and, unless the advocates of thin plates can offer proof to overthrow the analytical and experimental results of Professors Rankine and Johnson, it might be well for them to be less dogmatic in their assertions. The subject is an interesting and important one. Perhaps some of your readers can furnish additional facts or data.—*Richard H. Buel in American Machinist.*

MICA AS A LUBRICANT.—A company has been organized in Denver, Colorado, which is introducing a new lubricant, the body of which is finely ground mica. It is said that the Rock Island railroad has been experimenting with it, with very satisfactory results. They cooled off journals that came in heated, by applying mica, and the agent reports that one which came in very hot was sent forward as soon as the mica lubricant had been applied. The train dispatcher received reports from different stations on the road where it had cooled off journals and was running all right. The experiments that have been made with mica lubricant and mica dope have been successful. The one was made with crude oil and mica, and the residuum from the wells, being a very much cheaper grade of oil. The officials of the Union Pacific and of the Denver & Fort Worth roads have also applied for the privilege of a test. The mica is ground to a most excessive fineness. The Denver *Scientific Record* says it will be curious if this singular mineral should be found to be a lubricant, to serve so useful a purpose as that of a substitute for that crudest of devices, a huge clot of waste saturated with oil.

WINDING A HEAVY SPRING.—A heavy spiral spring was wanted for a line shaft to show the amount of power that was being transmitted. A long bar of steel was sent for and soon one end was heated in a forge. A piece of steam pipe some six inches in diameter was laid over the fire and held in a frame, with holes in one end for a bar to turn it with. The bar of steel was then made fast to the pipe with a tap bolt, and the winding of the spring commenced. The fire came so near the bite of the roll, or the spot where the bar first begins to bend, that it was wound as fast as it became heated, and all that was required was to keep up a constant strain on the driving lever and let the bar take care of itself until the coil was finished. After winding, the coils can be opened, to give them clearance, with a cold chisel.

FOR CEMENTING IRON.—The following mixture has been used, says a cotemporary, with the greatest possible success for the cementing of iron railing tops, iron gratings to stoves, etc.; in fact, with such effect as to resist the blows of a sledge-hammer. This mixture is composed of equal parts of sulphur and white lead, with about one-sixth proportion of borax, the three being thoroughly incorporated together, so as to form one homogeneous mass. When the application is to be made of this composition, it is wet with strong sulphuric acid, and a thin layer of it is placed between the two pieces of iron, these being at once pressed together. In five days it will be perfectly dry, all traces of the cement having vanished, and the work having every appearance of welding.

OILING SELF-LUBRICATING BOXES. — One trouble with self-oiling boxes, where a line shaft has been provided with this means for lubrication, says the Chicago *Journal of Commerce*, is that they will go so long without oiling that the one who has them in charge forgets all about them, and loses all thoughts of a hot bearing until the shaft cuts through the lining of the boxes into the cast iron, and has grooved the shaft all to pieces. An oiler can look after all the bearings every day as well as not, and give the jack shaft his closest attention once a week without fail; but time flies so readily with his trade that a year and six months have gone by before the six weeks are up in his calculations, the extent of which a self-oiling box is supposed to take care of itself.

STEEL TAKING THE PLACE OF WOOD IN RAILROAD CARS.—Steel seems to a great degree to be taking to a constantly increasing extent the place of wood in the construction of railway rolling-stock. Truck frames, made of hydraulically pressed steel plate, are now produced, and it is proposed, by means of special shapes in which it may be pressed, to use it in place of wood in building locomotive cabs, and eventually in building cars. A great saving in dead weight, smaller number of parts and decreased cost are pointed out as the result of such a change in the manner of construction.

THE WORLD'S INDUSTRY.—"The question for the world of industry is, who can give us a safe and serviceable water furnace?" To the above remark by the *American Artisan*, the Chicago *Journal of Commerce* replies: "No; the man who can give us the best gas furnace, the gas to be evolved by the combustion of the most common, cheap and worthless material, or from atmospheric elements, at the least expense and trouble, will solve the biggest problem of the age."

CHEAP ALUMINUM.—A practical inventor of New York City says that he has discovered a method of mechanically separating aluminum from clay, of which it is the chief ingredient. He claims that he will produce this metal at a cost which will not exceed cast iron. He is about to take out a patent for his process, the nature of which he is unwilling to disclose.

PULVERIZED FUEL. — Coal-dust triturated into dust as fine as flour has just been tested as a fuel for iron-making at the Morehead mill, Sharpsburg, Pa., and found to accomplish as much in one hour as the gas furnace does in one hour and a quarter. Being mine refuse, it costs nothing.

THE GREAT CENTENNIAL ENGINE. — The famous Corliss engine that was built to drive the machinery of the Centennial Exhibition of 1876 is now in the shops of the Pullman Car Co. at Kensington, near Chicago. It is the largest engine in the world.

SCIENTIFIC PROGRESS.

Chinese History.

How It Is Compiled by a Commission of Literary Men.

A writer in the *North China Herald* of Shanghai says that Chinese history is compiled by a permanent commission of accomplished literary men, who are always at work upon it. In 1737 an imperial edict stated that history ought not to be written for the Emperor's use only, and remain shut up in golden caskets and marble chambers; it ought to be made accessible to all officials, that they may know the mind of the Emperors and the laws of the land.

From the Chinese standpoint, history is divided into two parts, one an exact narrative of events, the other a record of what the Emperor has said and done. This division originates two sets of publications, one in which the officers speak, the other in which the Emperor is the spokesman. In the first, the industry of the bureau of history is run in the collection of facts, but there is always a danger that the recorder may be under a strong court influence. Historical candor can scarcely find a place in reference to nations or persons who have been in conflict with the court. With this exception, the array of facts thus recorded is most valuable.

The edicts published in the second series express the mind of the Emperor. He is always a man who has the advantage of good training, and if his style is tolerable and he happens to be fond of writing his edicts himself, they will all be transmitted to future times in full. The scribes, who stand writing when he speaks, translate his spoken words into official phrases, and his opinions and decisions will then pass into official history, partly written by himself and partly by the scribes of the cabinet.

Besides these there are various series of historical works—the first having been prepared in the eleventh century—to popularize the subject and place the chief facts of the Chinese annals within the reach of common readers, who have not the opportunity to study them in full. The last of these has just been published. It deals with the reign of Kienlung, from 1736 to 1795, and is in 60 volumes. Every important public matter is recorded under the day on which it occurred. The Emperor has, as usual, the lion's share of the talking, and there is room for him to say a good deal in 120 chapters, some of them very long.

Dalura Decoration.

A very marked advance in art decoration has been made by Messrs. Ludwig & Radeke in their process for producing designs in relief in solid wood by the combined agencies of heat and pressure. This process, the results of which are known as dalura decoration, is carried out by the aid of a small machine measuring only 3 feet 6 inches in hight (plus a stand 1 foot 6 inches high) by 3 feet wide and 2 feet deep in plan. The main working part consists of a pair of horizontal steel rollers revolving slowly and heated in the interior. The upper roller carries around its circumference the pattern, the lower roller being smooth. The wood, which may be of any quality and length, is passed between these rollers under pressure, and upon the upper side the pattern is produced, the surface being compressed. The pattern comes out in relief, which is varied in depth according to the style of work. The grain of the wood is retained, the background being toned from a deep to a pale brown, or left plain, as desired. The depth of color is regulated by the heating of the upper roller and the rate of travel of the wood, the raised design standing out in the natural color of the wood.

We recently inspected the working of this process at the office of the company, 24 Queen Victoria street, London, where we saw an elegant pattern produced on wood 8 inches wide at the rate of about 1.4 foot per minute. An important feature of the dalura decoration is that it resists the action of damp in a remarkable degree. Some samples were shown us which were said to have been immersed in water for several days without any prejudicial effect being perceptible on the work. The system was shown as applied to furniture and internal decoration in a variety of patterns, and both in the curved and straight form. It is claimed that the dalura decoration, being waterproof, is applicable alike to indoor and outdoor ornamentation, and, from the saturated but uninjured state of the sample we examined, we think the claim is a reasonable one. We are satisfied that the process is one which will enable art decorations to be indulged in, where otherwise their introduction would prove prohibitory on the score of costliness.—*London Iron.*

HOW A SOLDIER ESTIMATES DISTANCES.—It constantly happens that men detached from the main body of an army are called upon to determine for themselves their distance from an object to be fired at. No assistance can be given—nothing but a stern reliance upon one's judgment and the size and appearance of surrounding objects. Experience abundantly proves that even the rawest of recruits may be taught to estimate distances approximately from his base-line to at least 2000 yards away, and by simple, rapid observation. Every soldier is supposed to have good eyesight; he therefore, after a little practice in sight-estimating, learns the following facts: At 30 yards the white of a man's eyes is plainly seen, and the eyes themselves at 80 yards. At 100 yards all parts of the body are seen distinctly, slight movements are perceptible, and the minute details of the uniforms can be distinguished. At 200 yards the outlines of the face are confused and the rows of brass buttons look like yellow stripes. At 300 yards the buttons are no longer visible. At 400 yards the face is a mere dot, but all movements of the legs and arms are still distinct. At 600 yards details can no longer be distinguished, though the files of a squad, if the light be strong, can be counted. At 800 yards the men in a squad cannot always be counted nor their individual movements distinguished. At 1000 yards a line of men simply resembles a broad belt; the direction of their march can, however, be readily determined. At 1200 yards infantry can be distinguished from cavalry. At 2000 yards a mounted man looks like a mere speck or dot. The above rules are applicable in the beginning only to smooth, open country, but after a little practice they apply also with equal force to rough, broken country as well.—*Cleveland Leader.*

Is the World Wearing Out?

Everybody knows that the world is wearing out, says the Chicago *News*—that the time is coming when we will have no coal and no iron. A close record of the output of the oil-fields discovers the fact that petroleum reservoirs are running dry and investors have not the faith in the inexhaustible flow of natural gas that the sellers of wells would wish. We know that the precious metals are dug out in less quantities than formerly; that the diamond market, in spite of Kimberley, is cornering itself; that the mahogany and pine will some day be things of the past, like the buffalo robe and dodo. We are confronted with the fact that the guano deposits will not last forever, that there is a human limit to the production of electricity, and that our children several times removed will have neither quinine, chloroform nor aniline dyes.

Of course this general exhaustion of old earth's treasure-house is some time ahead of us. It will not happen in our day nor in the next century. We can go on burning the candle at both ends for a few hundred years before humanity has to adjust itself to the newer or more economical conditions. But despite the fact that the time of stress is so far ahead of us that we can look on it jokingly, it is pleasant to learn that science is getting ready for the rainy day. We are on the eve of a new age and on the threshold of a new civilization. Aluminum, according to nature, is making ready to take the place of steel, and it will be cheaper, lighter, stronger and one thousand-fold more plentiful and cheap.

Its price now puts the new elements in the debatable land between pure chemistry and practical commerce, and it is a question of time merely when we shall build our houses, our telephones, and our air-ships out of the silvery core of our common clay, instead of heavy and refractory iron.

Heat and food, according to science, we are to gather from the sea in proper fish culture and wise electrical work. The economist brightly believes that we will solve the labor problem before the middle of the twentieth century, and solve it to the satisfaction of both parties.

ELECTRICITY is a peculiar agent, capable of producing certain very astonishing results. There are different forms of electricity and different ways of generating it. Statical, dynamical and magnetical electricity or magnetism are its various forms. It may be generated by means of friction, percussion, heat, chemical action, cleavage, and by magnets. The effects of electricity in its different forms are manifested as attraction, repulsion, light, heat, violent commotions and chemical decomposition. According to the generally accepted theory, there are two so-called electrical fluids, and these two are mingled together in equal proportion in all bodies. These two fluids are called positive and negative electricity. It is found that when two bodies are electrified with the same kind of electricity—as both with positive or both with negative—they repel each other; but when the two bodies are charged with opposite kinds of electricity—as one with positive and one with negative, or when one body is charged with either kind while the other is left in its normal condition—then the two bodies attract each other. The glass insulators on telegraph poles prevent the electricity from leaving the wires and running off into the ground; and the non-conducting materials placed around the wires of submarine cables so protect it that a small charge of electricity will carry a message across the Atlantic. Consequently, when it is desired to insulate electricity, and keep it from running off into surrounding objects, the medium containing it is surrounded with a poor conductor. Of these preventives or non-conductors, amber, glass, sulphur and silk are the most prominent examples.

THEODORE URBAN, an antiquarian and student of Columbia, says he has evidence that this continent was settled about 650 years after the deluge; that the different tribes that sprang up were in constant communication, sharing alike in its high civilization, and that they not only used stone but tools of metal.

GOOD HEALTH.

The Length of Life.

Life-insurance men have made of the question of longevity almost a determined science, with an ample array of figures and rules. According to these, the average man who has reached the age of 60 has still a little less, and the average woman who has reached the age of 60 a little more, than 14 years to live. But the expectation of life does not, relatively, diminish with the advance of years, for at 80 the man's chance is somewhat less, and the woman's somewhat more, than five years and a half. According to the English standards, the persons who live longest are members of the clergy, while in other pursuits longevity ranks in the following order: Farmers, merchants, soldiers, clerks, teachers and physicians. The death-rate among the clergy of the Established Church of England is exceptionally low, being in the years of active clerical service only 10 in 1000 of population, whereas that of the English Catholic clergy is 50 per cent higher.

The figures of the insurance companies, which are ample regarding every point involved, show that, the age of 50 passed, the expectation of life is more than twice as great for the temperate as for the inebriate, the proportion being as seven to three. The proportion of the rich as compared with the poor, over 70, is about four to one, and it is generally higher among women than among men.

We suppose there is no country of the world where the science of long life, accompanied with good health, unimpaired mental faculties, good digestion and great activity, is better understood than in France, and there, of 1000 persons born, 120 reach the age of 70, and the percentage continues to be high until 85 is passed.

The nervous, exciting, restless life of most Americans is not conducive to extreme longevity, and the steadily large immigration of those who have reached the years of manhood in other lands as emigrants tends to greatly reduce the standard of longevity in this country; but the tables of American insurance companies show that it is steadily rising. Should this increase continue, it may not be many years before the rate here will compare favorably with what long experience and repeated proofs have shown to be the normal rate in other lands.—*N. Y. Sun.*

Facts About Insomnia.

Are you afflicted with insomnia? Perhaps you have too much time for sleep. Perhaps you depend too much on sleep for rest and recuperation. For sleep is not the sole rest of used-up nerves. Sociability, congeniality and the enjoyment of good company rest the body quite as much as sleep. The dreary monotony of life in many a household, involving this tumbling into bed with the mechanical regularity of a machine at 9 or 10 o'clock in the evening, does not always rest weary bodies. "Early to bed and early to rise" does not always make a man healthy, wealthy and wise. Numbers of organizations are only capable of only five or six hours of sleep at a time, and their early lying down to rest is often succeeded by an early waking up and a consequent restless tossing for hours preceding daybreak. The practicers of punctuality are often surprised after breaking their cast-iron rules, and passing two or three later hours of mirth and jollity past their usual bedtime, to find themselves even more refreshed in the morning than usual. The relaxation of sociability has rested them more than sleep would, or an attempt to sleep. But these are conditions not so easily reached in the average family.

In fashionable life we have a formal, exhausting, mechanical evening of more or less dissipation. On the other hand, the evenings of great numbers of families are a monotonous humdrum. They involve the assemblage of the same people, the same surroundings, the same paterfamilias yawning over his paper, and the same querulous mammas overladen with family cares. Fresh people, with fresh thought, fresh atmosphere, anything to stir up and agitate the pool of domestic stagnation, are sadly needed and sadly scarce. There needs to be also a constant succession of such fresh people to bring about these results.

The world is full of men and women, and in a better regulated life it would be their business after the day's work was done to entertain each other, and give each other fresh life. As it is now, hundreds if not thousands of our households are little better than cells for the incarceration of each family. Thousands are thus worn out prematurely from utter lack of domestic recreation. There might be written over the graves of hundreds of thousands, "Bored to death by the stagnation of domestic life."—*Christian at Work.*

LOCKJAW TREATED BY ABSOLUTE REST.—Prof. Renzi of Naples records several cases of tetanus successfully treated by absolute rest. The method advocated is as follows: The patient's ears are closed with wax, after which he is placed in a perfectly dark room far from any noise. He is made to understand that safety lies in perfect rest. The room is carpeted heavily in order to relieve the noise of stepping about. The nurse enters every quarter of an hour with a well-shaded lantern, using more the sense of touch than sight to find the bed. Liquid food (milk, eggs in beef tea, and water) is carefully given, so that mastication is not necessary. Constipation is not interfered with. Mild doses of belladonna or secale are given to relieve pain. This treatment does not shorten the disease, but under it the paroxysms grow milder, and finally cease. Numerous physicians attest to the value of this treatment.—*Medical Bulletin.*

DISINFECTION OF THE SICK-ROOM.—In the sick-room no disinfectant can take the place of free ventilation and cleanliness. It is an axiom in sanitary science that it is impracticable to disinfect an occupied apartment, for the reason that disease germs are not destroyed by the presence in the atmosphere of any known disinfectant in respirable quantity. Bad odors may be neutralized, but this does not constitute disinfection in the sense in which the term is here used. These bad odors are for the most part an indication of want of cleanliness or of proper ventilation; and it is better to turn contaminated air out of the window or up the chimney than to attempt to purify it by the use of volatile chemical agents, such as carbolic acid, chlorine, etc., which are all more or less offensive to the sick, and are useless so far as disinfection—properly so called—is concerned.

EXCESSIVE BEER DRINKING.—Last week saw two prominent brewers buried, and two others of the guild are near dying. None of them were, or are, over 47 years old. Kidney and heart disease were the causes of death in the case of Mr. Ringler and Mr. Schmidt. Similar ailments have marked the two gentlemen for the grave. The question arises, was it beer or champagne that caused these diseases? In this connection the statement of a physician of Bellevue Hospital once made within my hearing is not amiss. These are his words: "The worst cases of alcoholic ailments coming under our observation are those resulting from excessive beer-drinking."—*N. Y. Truth.*

A SOURCE OF INDIGESTION.—It has been proved that the stomach never performs its duty so effectually as when called to act on a variety of food, provided, of course, that the food is well cooked. The popular opinion now is that a dinner consisting of three or four varieties of solid food is more easily digested than the meal which is confined to one sort only. The old-fashioned notion of a single joint and a simply made pudding is pronounced to be a fruitful source of indigestion.

USEFUL INFORMATION.

Fly-Time.

What a world of painful memories the words bring to the mind of the housewife! What recollections of deceased insects found in the butter and the milk! What traditions of flapping towels to drive the pests from the premises and of scouring the woodwork after their departure! To the bald-headed man, fly-time is not attractive. The irreverent flies use his smooth head for a resting-place, and he smites himself heavily thereon in the vain attempt to cause a decrease in their number.

To the horse, if horses have the power of memory to that degree, the approach of fly-time must be filled with agonizing expectation, and its arrival but a realization of his fears. He is tormented by flies singly and in groups. They buzz about his ears and tickle his nostrils. Those who have been supplied by a divine Providence with the proper instruments, proceed to make a meal of his blood. He thrashes about, stamps his feet, and tries to brush them off with his tail, but, that appendage, even if his humane owner has not cut half of it off, will not occupy more than one place at a time.

How to Get Rid of the Pests.

The Louisville *Commercial* states how a prominent druggist of that city hit on a novel scheme to get rid of the troublesome insects: "Bodine, a druggist in Louisville, runs a soda-fountain, and everybody knows how the flies are attracted by the syrups, etc. The druggist was almost in despair at the swarms of these buzzing pests which made their rendezvous at his store. He dared not use the insect powder in the ordinary way, and the fly paper was too filthy to be considered. In the midst of his dilemma he accidentally discovered that the insect powder is of almost as rapid combustion as gunpowder, though the flame lives several seconds. By a further investigation he discovered that a portion of the powder thrown from the bellows through the flame of a lighted match held six inches away, produced the required flame, and was capable of destroying flies by the million. He, therefore, puts out some bait for them every morning. When they have collected in sufficient numbers, he gets his powder and match, and the work of destruction is sure and swift. No guilty fly escapes the scorching of the wings. By this means all the flies in the store can be destroyed in a few minutes, and their flayed remains are dumped into the street by the gallon."

In the same paper we are told that other soda-fountain men have adopted the idea, and they say it works like a charm.

THE PROPER WAY TO PUT DOWN A SILK HAT.—Somebody gives the following advice under the above head: It may seem a very simple matter to lay our silk hat down properly, and it is, but the following from a fashionable hatter will show that there is one simple way, which is the best: "Never place your tile so that the crown will lie flat on a table. It is quite a common thing for men to do, and then drop their gloves into the hat. Besides injuring the gloss, this method permits dust, if indeed it does not permit grease, to collect on the crown, and thus necessitates frequent ironing. Don't rest the hat on its rim erect, either. Nothing will change the shape so much as this, besides giving the tile an opportunity to flop over and possibly drop on the floor. Again, never hang up a tall hat. Nine chances to one it will get brushed off the hook or nail. Never hold a tile in your hand. If you do so you will surely put the front part of the rim out of shape. Don't hold your hat by the side of the roll, no more than you should pull your ears out from the side of your head. In either case the result is the same. Having avoided all these errors, place your hat carefully on a table so that a trifle of the roll and a trifle of the edge of the crown will support it. In this way the weight of the hat is evenly balanced, and only a little of the silk will come in contact with dust or other foreign substance."

GLOVES MADE OF HUMAN SKIN.—"Gloves which are sold as kid are often made of human skin," said Dr. Mark L. Nardyz, the Greek physician of 716 Pine street, recently. "The skin on the breast," continued the physician, "is soft and pliable, and may be used in the making of gloves. When people buy gloves they never stop to question about the material of which they are made. The shop keeper himself may be in ignorance, and the purchaser has no means of ascertaining whether the material is human skin or not. The fact is, the tanning of human skin is extensively carried on in France and Switzerland, and the product is manufactured into gloves, which are largely imported into this country. Thus, a person might unknowingly be wearing a portion of a distant relative's body upon his hands." So says the Philadelphia *Record.*

WHISKY AND MELONS.—A gentleman who has tried it vouches for this story: Taking a gallon jug of whisky, he passed a cord through its cork, which cord he dropped to the bottom of the jug. The twine was then introduced into a watermelon vine, by slitting the vine, and the vine permitted to produce only two melons. When the melons were matured they were served at a private barbecue to six gentlemen. The effect was astonishing. The gallon of whisky got in its work. Not a drop of the liquor remained in the jug when the melon was ripe.

FEEDING A DOG.—How often is it best to feed a dog? I have an English setter pup about four months old, and nearly every one I have asked about this matter of feeding gives different advice. Some say feed three times a day, some twice and some only once. *Ans.* Three times a day now, falling to twice a day when the dog is six months old. After a dog is nine or ten months old, once a day is often enough.—*Forest and Stream.*

AN AGRICULTURAL DEVICE WANTED.—The State Grange of Illinois, through its Executive Committee, headquarters at Joliet, offers $10,000 to be paid to any one who will invent a machine or device to attach to reapers that will bind wheat and oats with straw. Such a machine might be useful in the slow process of harvesting in the East, but would be useless in California.

SMALL articles of brass and copper may be whitened by boiling them in a solution of three-fourths of one pound cream of tartar, two quarts of water and one pound of grain tin or any pure tin finely divided. The tin dissolves in the cream of tartar and is again precipitated on the brass or copper.

THE EIFFEL TOWER has had a chance to prove itself of practical value. A barge having become disabled on the Seine by night, the electric light was turned on the river, and the sailors were enabled to save both themselves and the cargo.

CURIOSITIES OF RAINFALL.—An odd scene occurred the other day in two hay fields not an eighth of a mile apart at Lancaster, Pa. In one, all work was stopped for the day by a pouring rain, while in the other not a drop fell all day.

WOLVES IN RUSSIA.—The number of wolves in European Russia is estimated to be about 175,000. These wolves destroy annually 180,000 head of cattle, 500,000 sheep, 100,000 dogs, besides 150 human beings.

AMERICA publishes more papers than all the rest of the world combined. Last year its 17,107 periodicals printed the enormous number of 2,958,556,500—enough to supply every soul on earth with two newspapers.

ALUMINUM for dental purposes is said to be coming into favor. It is pronounced better than rubber and less in cost than gold. It is bright, strong, odorless, and as healthy to the gums as gold or platinum.

SET a small box of lime in the pantry and it will keep it dry and the air pure.

ENGINEERING NOTES.

NOVEL ENGINEERING.—The operations on the seawall of this city, which have been progressing for some months, preparatory to laying the concrete foundations upon which the new ferry buildings are to rest, are now approaching a definite basis. The work done heretofore has been principally the tearing down of the old superstructures, dredging out the slip and the removal of obstructions; but of actual construction work thus far but little has been accomplished. The laying of the concrete foundation will be commenced in a few days. It will extend a distance of 450 feet, from a point about 150 feet easterly from the line of East street. This wall will be built in sections of about 75 feet in length, and in order to do this a coffer dam 76 6 feet in width and 22 feet in depth is being constructed, and is now about ready for submersion. This coffer dam will be sunk to the foundation, and is water-tight. After it has been sunk the water will be pumped out and the work below the water-line will be proceeded with as if it were being done on dry land. When the first section is completed the dam will be raised, and then sunk again for the building of the next sections. In some respects the work to be done at this section is novel to our local engineers, and is therefore to a certain extent experimental.

QUEEREST OF ALL CANALS.—"The strangest canal in the world is the one I never saw mentioned in any book or newspaper," said a clergyman to a St. Louis *Globe* writer. "It is a canal sixteen miles long, between Worsley and St. Helens, in the north of England, and is underground from end to end. In Lancashire the coal mines are very extensive, half the country being undermined, and many years ago the Duke of Bridgewater's managers thought they could save money by transporting the coal underground instead of on the surface. So the canal was constructed, the mines connected and drained at the same time. Ordinary canal-boats are used, but the power is furnished by men. On the roof of the tunnel arch are cross-pieces, and the men who do the work of propulsion lie on their backs on the coal and push with their feet against the crossbars on the roof. Six or eight men draw a train of four or five boats, and as there are two divisions in the tunnel, boats pass each other without difficulty."

HARRY MEIGGS' SKY RAILROAD TO BE ABANDONED.—The telegraph announces that the Verugas bridge, recently destroyed by heavy floods in Peru, will never be rebuilt. This indicates that the Oroya railroad, one of the marvels of engineering skill, will be abandoned. It was built at an enormous cost by Henry Meiggs, who fled from California in 1854, to escape the consequences of a fraudulent career in San Francisco. He went first to Chili, gaining the confidence of the Government of that country, and made money as a railroad contractor; then went to Peru, where the Government assisted in the great work of building a railroad over the Andes. The track climbed the mountains to an altitude of 12,000 feet, and work was then temporarily abandoned. Meiggs died. It was the intention to push on into the fertile interior, but nature seems to have now put her veto on this.

THE BEAR RIVER CANAL OF UTAH.—The great Bear River Canal is to be one of the grandest irrigation projects in America. Two million dollars have been provided for its construction. To get the river along the side hill along Bear River Canyon and out on to the plain near Plymouth will necessitate moving 220,000 cubic yards of solid rock, 19,000 cubic yards of loose rock, 1,528,000 cubic yards of earth and digging 1200 feet of tunnel. This canal will irrigate 200,000 acres in Salt Lake valley, 6,000,000 on Bear river, increasing the value of the land to $50 per acre, while fencing, building and tillage will double this valuation in a few years. Bear Lake is in Southeastern Idaho. The reservoir for this canal covers 150 square miles and the canal will secure the irrigation of a territory extending to Ogden.—*Salt Lake Dispatch.*

THE HUDSON TUNNEL.—It is a singular fact that the tunnel under the Hudson, one of the biggest enterprises of modern times, is rarely mentioned in the newspapers. The tunnel is going quietly forward. There has been expended on it $1,000,000, and $2,500,000 is in hand to proceed with. The distance is 5600 feet. One of the two passages is completed a third of this length, and the other more than a tenth of it.

THE CONGO RAILROAD.—The telegraph reports that all the money needed to build and equip the Congo railroad has been subscribed. The amount raised is $5,000,000. The subscribers include leading banking-houses and capitalists in Belgium, France, Germany, England and the United States.

FRICTION ON THE HEAD.—"A great many people still firmly believe the old notion that friction on the head stimulates the intellect," said a barber the other day, as he stropped his razor with a contemplative air. "I know several lawyers who just before they are to make a plea invariably have their crowns vigorously rubbed. They say that it not only brightens up their ideas, but gives greater power of concentration upon a single thought."

MINING AND SCIENTIFIC PRESS

A. T. DEWEY. W. B. EWER.

DEWEY & CO., Publishers.

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☞ *Take the Elevator, No. 12 Front St.* ☜

W. B. EWER.....SENIOR EDITOR

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SAN FRANCISCO

Saturday, August 3, 1889.

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[NEW THIS ISSUE.]

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Square Flax Packing—W. T. Y. Schenck.

☞ *See Advertising Columns.*

Passing Events.

The finding of a strong flow of natural gas while boring for coal at Roslyn, near Ellensburg, is a very important thing for that portion of Washington Territory. As that region is being developed by capital and increased population, its great natural wealth becomes more apparent.

The earthquake of Wednesday morning, though of short duration, was the most severe experienced here since the memorable one of 1868.

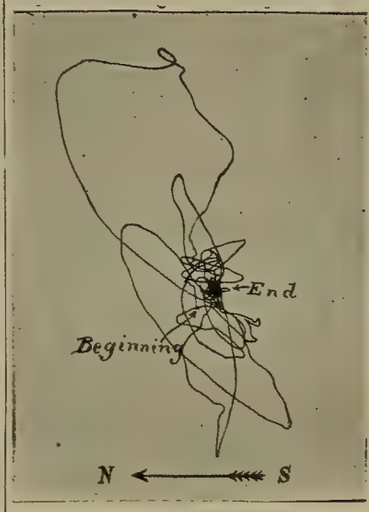
The White Lead Trust has secured the controlling interest of 96 per cent of all the United States companies. It is estimated that the capital expended in making the purchases was $60,000,000. The highest price paid for any single concern was $4,000,000 for the Atlantic White Lead Co. of Brooklyn.

The purchase of the placers in the Silver Bow basin, Alaska, is one of the most important transactions which has taken place in that Territory. The ground will now be worked on a large scale, for there is plenty of water and a good dumping-place.

The much-talked-of Newberry-Vautin process is to be put in practice in Grass Valley, an English company having been organized to operate the process there.

The Earthquake.

On Wednesday, at about 4:45 A. M., we experienced here the heaviest earthquake since the memorable one of 1868. One occurred May 19th which was quite sharp, but that of Wednesday was more severe, though it only lasted about 14 seconds. It was felt at Napa, Oakland, Benicia, San Leandro, Petaluma, Santa Cruz, Mt. Hamilton and elsewhere. No special damage was done, though a few buildings and chimneys were cracked. Prof. Geo. Davidson says: "At my residence, Hyde near California, the shock lasted 14 seconds. There was



Seismograph Tracing.

nearly at the middle of the oscillations a second shock. About 4h. 56m. there was a tremor of less than half a second's duration, up and down, and at 5h. 5m. a second tremor, slightly stronger, but of the same length.

"The main shock was east and west and gradually fell into oscillations running east-northeast and west-southwest.

"The amplitude of this earthquake shock is one-half greater than that of May 19th."

Astronomer Burckhalter of the Chabot Observatory, Oakland, in speaking of the shock said: "There is a great mistake as to the actual amount of movement of the earth in an earthquake. In the Chabot Observatory this morning the earth moved a little less than a quarter of an inch, and in East Oakland, where the shock was heavier, it moved about 5-16 of an inch. An earthquake in which the motion was a half-inch would prove very disastrous, and yet people do not hesitate to say that they saw the earth move at least a foot. This earthquake was by far the heaviest ever recorded at the Chabot Observatory. It was at least 50 per cent heavier than that of May 19th, and that had been the heaviest up to that time."

Prof. E. S. Holden, director of the Lick Observatory, says: "Mr. Keeler, in charge of the earthquake instrument, has just measured the intensity of the shock of this morning. It recorded that the shock occurred here at 4h. 46m. and 45s., and lasted for 30 seconds. The extreme motion was from north to south. It was equal to 2 100 of an inch, and the east and west motion was about the same. The vertical motion was very small. The period of the wave was about 3-10 of a second, and its intensity is estimated at five."

At the students' observatory at Berkeley the shock was registered as occurring at 4:47 o'clock in the morning and lasting 15 seconds. The vibration was from north of west to south of east. It was followed by three slight ones at short intervals. Prof. Frank Soule says that this was the most severe earthquake that he has experienced since he came to California in 1869. He classes it as sixth in the Rossi-Forel scale—that is, one that throws down chimneys and small articles.

Prof. Davidson expresses the opinion that the quake is in no way connected with the Japanese catastrophe, but is of local origin, very probably linked with the phenomena of subterranean activity at Susanville.

Mr. F. G. Blinn of Highland Park, East Oakland, has given us a tracing from his seismograph, which is reproduced herewith. The figure magnifies the motion four and eight-tenths times. According to his instrument, the actual motion of the earth was .53 of an inch—a little over half an inch. The center of the shock appears to have been near that locality; it was more severe in Fruitvale, to the eastward, where some chimneys were thrown down and glass broken. The shock was felt some seven seconds later in San Francisco than in East Oakland, and appears to have been lighter outside of the latter point.

Mr. Adley H. Cummins, a scientist, who has lectured several times before the California Academy of Sciences, was so startled by the earthquake shock that he died. Mr. Cummins had been suffering from heart disease.

Annual Expenditure on Claims.

EDITORS PRESS:—You will oblige me by publishing a statement as to whether a mining location, dated Jan. 1st, will hold one year or two without doing any assessment work required by the laws. N. D. S.

Mineral Park, Arizona.

The annual expenditure work, as far as the U. S. laws are concerned, is only necessary in the second, not the first, year. The law explicitly states: "On each claim located after May 10, 1872, and until a patent has been issued therefor, not less than $100 worth of labor shall be performed or improvements made during each year. *Provided*, That the period within which the work required to be done annually on all unpatented claims, so located, shall commence on the 1st day of January *succeeding* the date of location of such claims."

It may be remarked relative to the time when assessment work is to begin on a newly located claim that the Land Office holds that labor performed or money expended upon a mining claim *prior* to the 1st day of January *succeeding* the date of location will *not* be considered as a part of or applied upon the first annual expenditure required by law. Thus, upon a claim located at any time during 1889, the *period* within which the labor must be performed commences Jan. 1, 1890, and *during* the calendar year, 1890, the expenditure must be made, or the claim will be subject to relocation on and after Jan. 1, 1891.

The expenditures may be from surface or by tunnel. They may also be made by an agent and not the owner himself. It must be remembered, too, that a large expenditure in the past does not excuse the required *annual* expenditure.

Hoisting Cage.

The engraving on page 81 represents a modern hoisting cage, such as is used in the coal regions of the United States.

Upon two opposite sides of the pit are located the guide bars, which are usually constructed of hard wood. In order to provide against accidents in case of the rope breaking, the cage is provided with safety catches, the action of which is such that the instant the tension on the rope is released the quadrant racks shown at the side of the cage imbed themselves in the guides and the cage is arrested in its descent. This movement is effected by a series of rubber springs set in telescopic distance rings, through which the draw-head bolt passes, the whole being encased in the spring pocket shown underneath the draw beam. When the rope is in tension the draw-head bolt passes through and underneath the spring pocket and compresses the springs; but upon the release of the tension in the rope the springs push the draw-head bolt in toward the center of the cage, and thus act upon the levers connected with the quadrant catches.

Another arrangement contributing toward the safety of hoists is that known as *cage landing fans*. These consist of arms or prongs so arranged that the cage with its contents is landed upon them, where it is perfectly secure until the car is run on or off. The signal being given to lower, the fans are thrown back by means of a series of levers, and the cage is allowed to descend.

FOREST FIRES are blazing in all directions in Montana, in the mountains, and along the Missouri. The destruction to timber is immense, and it has been only through great exertions that many mills and hoisting works at the mines have been saved. Stage travel between many places is suspended.

SAN BERNARDINO COUNTY has the largest railroad mileage in the State, the assessed valuation being nearly $5,000,000.

The Stewart Mining Bill.

It will be remembered that at the last session of Congress Senator Stewart of Nevada introduced a bill amending the mining laws in several particulars. The bill passed the Senate May 24, 1888, and while pending in the House Committee on Mines and Mining it was extensively commented on by the press. In conformity with the suggestions offered, Senator Stewart re-drafted the bill, and after its examination and approval by Senator Teller he submitted it to the House Committee at a meeting held January 10, 1889. It was carefully considered by the committee, amended in one or two slight particulars, and its chairman authorized to report it to the House. The bill failed to become a law.

Among other things, provision was made that the date on which claims could be relocated, from failure to make annual expenditure, should be changed from Jan. 1st each year to Aug. 1st. each year.

Senator Stewart will re-introduce the bill the coming session, but the date referred to is to be changed to October 1st, instead of August. There are several provisions of importance in the new bill, and as Senator Stewart is desirous of obtaining practical suggestions from miners concerning them, we shall print the bill in full next week.

The Globe Ore Concentrator.

The principle upon which this works is that ore passed through a perfectly regulated air-blast, if presented often enough to the blast, will be concentrated; and to do this, there are used a blower, regulator, and condensing chamber. The concentrating chamber consists of a revolving cylinder which contains buckets and a spiral screw; the buckets lifting and dropping ore through the blast in a spray. The tendency of the spiral is to carry the ore up to the blast and out at that end of cylinder, but the blast, acting upon the ore, blows the lighter particles backward, and finally out of the rear end; while the heavy particles come forward in spite of the blast, and pour out of the other; thus there is a continual stream at each end of concentrations and gangue. The success of the machine lies largely with the regulator, which delivers a perfectly regulated current of air, according to adjustment. No regulation of blast has been attempted before, although there are machines which regulate the quantity, and the slightest change in speed of engine causes the air to come in puffs, which makes good work impossible. The quantity of ore which can be handled is governed entirely by difference in specific gravity between valuable matter and gangue, as with galena ores the company claims to be able to concentrate from 15 to 25 tons, and of the lightest iron sulphurets from 7 to 15 tons per day. The machine is made by a company in this city.

THE ATLAS IRON WORKS.—The Atlas Iron Company is building new works, between the Union Iron Works and the Pacific Rolling-Mills. Of the $1,000,000 capital stock, $100,000 has already been paid in. The company expects to build steam schooners, which are quite popular now on this coast.

THERE are now 40 stamps operated by steam crushing ore from south-end mines. This number will soon be increased to 50 by the addition of 10 more to the Justice mill. When the 50 are in full operation the monthly bullion yield from that part of the Comstock lode will be about $100,000.

CEMENT DEPOSIT.—John D. Spreckels is said to have offered $100,000 for the cement deposit recently discovered at Jamul, San Diego county. This cement stood a test of 459 pounds to the square inch, seven days old. It is estimated that the Jamul deposit will yield 300 barrels a day

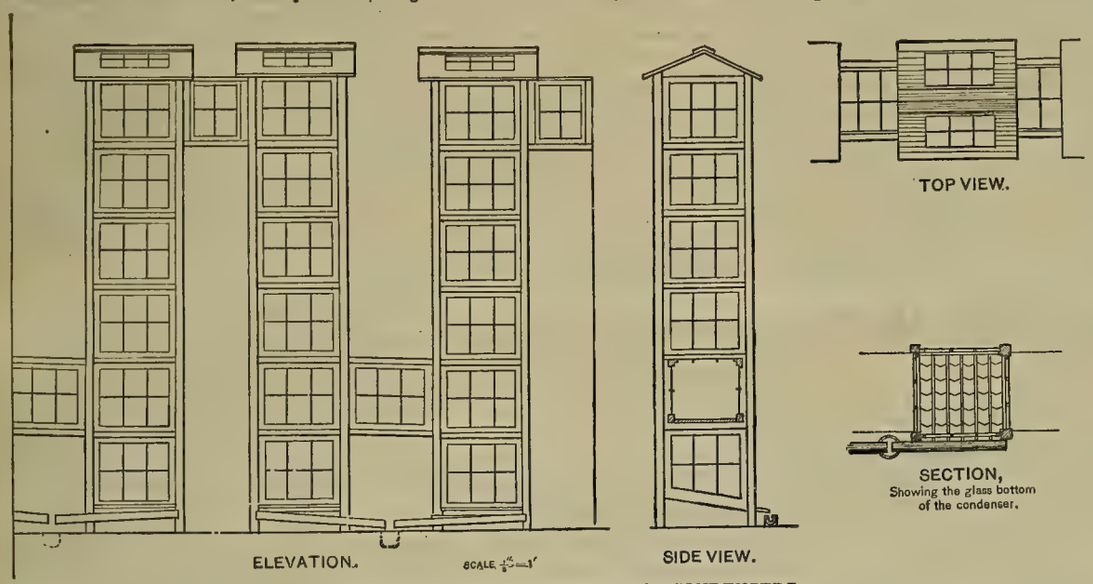
FAILURE OF THE SALT TRUST.—The North America Salt Company, erstwhile the salt trust, is unable to negotiate the $4,000,000 of bonds which it offered to the public, and the thousands expended in the formation of the trust are lost. The trust has been unable to corner salt.

ERRATA.—In the letter on Tuolumne mines, by "Argus" in the PRESS of July 20, page 42, "uniform masses of" should read "reniform" (kidney-shape). "Slating in places" should read "seating" (which is gneiss).

Quicksilver Condenser and Flues.

In his paper before the American Institute of Mining Engineers, Prof. S. B. Christy of the University of California describes the glass and wood condensers patented by Fiedler & Randol and used at the New Almaden mines. They replace heavy brick condensers in places where the temperature is low and acid waters plentiful. In their most approved form they are shown in the figure. As seen from the figures the top, bottom and sides of the condensers are constructed of sashes of ordinary window-glass set without putty. The woodwork of the structure is reduced to a minimum, and no nails or other metallic fastening are used in their construction. The bottoms, placed at a slight angle, are made of glass panes cut V-shaped at the lower ends and set like shingles on a roof; they drain all the condensed metal, water, etc., into a wooden gutter.

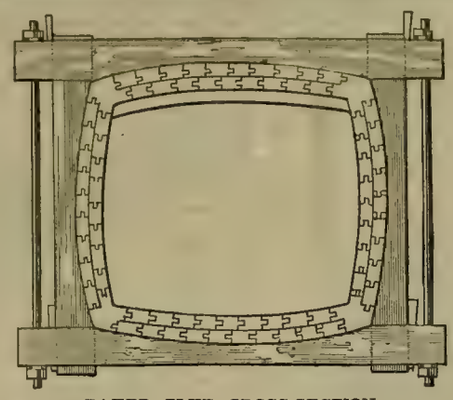
The general shape of the condenser as seen from the figures is that of a tall square prism (4½ feet by 4½ feet by 25 feet) surmounted by a glass roof. The condensers are connected with each other by flues of glass and wood similarly constructed. These flues join the condensers alternately at their tops and four feet above their bottoms. Consequently the fumes pass alternately up one condenser and down the next. In order that the condensed quicksilver globules may be removed as soon as possible from the action of the current, dead spaces are left at the bottom of each condenser into which such metal may settle. The condensers resist the acid waters very well and give very good results so long as they are kept in constant use, but when allowed to remain idle (during furnace stoppages) they dry and shrink, so when again used they at first leak and interfere with the draft of the furnace.



GLASS AND WOOD QUICKSILVER CONDENSERS.

After leaving the last condenser of each furnace system the fumes are conducted by wooden flues to brick towers, where they pass to flues up the hillsides. The Baker flue seems to be very successful, for it remains tight under alternate conditions of use and disuse. It is a nearly rectangular wooden tube, as shown in the cuts, though the sides are slightly cylindrical. The flue is made of two thicknesses of one-inch tongued and grooved redwood boards, laid so as to break joints, with a layer of asphaltum paper or felting between the joints. At intervals of six feet are placed square frames of 6x3-inch stuff, curved on the inside to grasp the sides of the flue, and arranged with wooden wedges for the side-frames and two tie-bolts for the top and bottom frames, so that the whole flue may be tightened by these means like a barrel.

These flues may be evidently built tight without the use of a nail, and, except the two tie-bolts which are exterior to the flue itself, without any metallic fastening whatever. They are wedged up close when they are dry, and when the moist fumes enter they swell perfectly tight. They are usually paved inside with a coat of hot asphaltum and coal-tar, and are painted outside. The two engravings show the Baker flue, except that as now built the corner timbers are left out, and the corners are made by the boards themselves, which are arranged to break joints.



BAKER FLUE—CROSS-SECTION.

Mining Statistics and the Census.

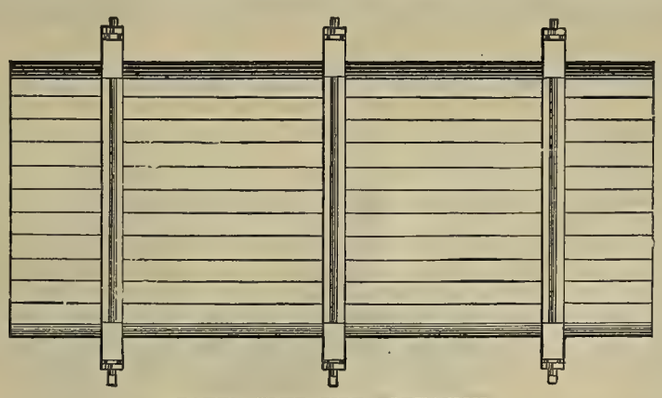
Mr. Porter, superintendent of the Eleventh Census, has placed the collection of the mining statistics in charge of Mr. David T. Day, chief of the Division of Mining Statistics and Technology, U. S. Geological Survey. No more competent or energetic man could have been selected. Mr. Day has for some years had charge of the "Mineral Resources of the United States," an annual volume issued by the Geological Survey, which is the most practical of the reports issued by the Government. It treats of all mineral and metallic substances except gold and silver, which are left to the Director of the Mint. If the statistics relating to them were also in the hands of Mr. Day, it would be better.

Mr. Day has had wide experience in the collection of statistics relating to mines and an excellent knowledge of the kind of information which is useful. He already has a small staff of assistants, but has always been hampered by lack of funds to carry out the work as he has desired. In the appointment he has just received he will no doubt be able to collect a vast amount of practical information which will be extremely valuable to all connected with the mining industry. Mr. Day visited this coast last summer, during which time the editors of the PRESS had an opportunity of forming his acquaintance. We feel assured that he will carry out his work with thoroughness and intelligence, and produce a report accurate, interesting and practical.

THE *Silver State* says: H. P. Bender has sold an antimony mine in Sacramento district, about eight miles east of Oreana, to an Eastern company. The vein is large and carries ore containing a high percentage of metal. There was estimated to be 160 tons of ore on the dump at the time of the sale.

AN injunction has been granted Herman Zadig in the District Court restraining R. F. Brodek from extracting ore from the Northern Belle No. 2 mining location in Devil's Gate District, Lyon county, Nev. Zadig claims that Brodek followed the ore vein into Northern Belle ground, and asks $5000 damages for that already extracted.

A MINING ditch at Canyon City, Trinity county, burst last week and did considerable damage to property in the neighborhood.



BAKER FLUE—SIDE ELEVATION.

To Work Low-Grade Ores.

Mining Operations in Amador County.

[Written for the PRESS by W. A. NEWCOM.]

The mining interests of California are at that point in their history which might safely be called the third era.

The first mining experience our State knew was conducted on the smallest scale by individuals whose chief mining implements were the "pan," "rocker" and "long tom." These men, in most cases, remained but a short time in a place, and after success or failure moved forward to better their fortunes, for the miners of those days were of a roving disposition, ambitious, dissatisfied, and filled with a desire to return with untold wealth to their Eastern homes, without remaining any length of time in the far West. They mined principally upon or near the surface in and around the mountain streams for auriferous gravel, and in the mountains where ledges cropped out and gold was easy and inexpensive to secure.

Later on comes the second era, during which local mining companies with limited capital were organized, and mining properties secured and developed as well as the capital and resources of the companies would allow. In many cases the mine-owners were afraid to invest extensively enough, with the result that the work was found unprofitable and abandoned to await the results of the advent of the third era.

Then comes the third era, which is marked by the diverting of idle Eastern and foreign capital, as well as local capital, from bank-vaults to the mining industries of our Golden State as a commercial enterprise. This era, where introduced, has enabled the erection of massive and substantial machinery, the sinking of deep shafts, and the cutting of extensive crosscuts and drifts, thereby opening up new and rich ledges and making it possible to work the low-grade ores which baffled smaller capital.

Our attention has recently been called to the Jackson mining district, around which clings so many memories of the pioneer and pioneer days in the first era of that great industry, which is now being developed by companies of almost unlimited capital.

The Jackson District.

The Jackson mining district in Amador county includes those mines in the immediate vicinity of Jackson. Of these mines the Zeile, Kennedy, and Amador gold mine are being worked most extensively. These mines are upon the great mother lode of California, which is known to extend about 100 miles along the western foothills of the Sierra Nevada mountains, through Mariposa, Tuolumne, Calaveras, Amador, and El Dorado counties, at an elevation of from 1000 to 2000 feet above the sea level. This formation through which this lode runs is from 400 feet to two miles wide, in which are a number of separate and distinct quartz ledges or veins dipping to the east at an angle of from 45 to 70 degrees, all of the same general character, which are mined and milled with great profit wherever worked on a large scale, or in proportion to the size of the lode. The hanging-wall is greenstone and the foot-wall, black slate. The foreign matter between the ledges or veins is generally slate, but sometimes is composed of greenstone.

The Kennedy was purchased by the present company about three years ago, in which time they have opened thoroughly a mine that had been idle for ten years, erected a 40-stamp mill, hoisting works, and other improvements, and put down the main shaft 300 feet deeper, and extended their levels. The Kennedy has paid very well while these improvements were going on, and now that everything is working very smoothly under the able management of Mr. J. F. Parks, one of the best gold-miners in California, the mine is, of course, expected to turn out large dividends.

The Zeile may be considered the "Old Reliable," as it has steadily run for about ten years, crushing with a 40-stamp mill 50,000 tons of ore yearly. They have their own chlorination works, and are able to work the ore very cheaply, and make a profit on a grade of ore that under unfavorable circumstances would have to be thrown over the dump. The superintendent of this company deserves the credit, and gets it, too, of being one of the best mining managers in the State.

The owners of most of the other mines are at present engaged in trying to secure foreign capital to develop their mining properties, or else have secured the same and are preparing to turn out the precious metal.

The Amador Gold Mine, Limited, of London.

The Amador gold mine is interesting as a mining proposition, because it represents the largest introduction of foreign capital in the district, and from the fact that the mill and hoist are among the best in California, and because it is a proposed candidate for dividend honors; for these reasons we note particularly the operations of this company.

The company owns about 90 acres of patented land all fenced and cross-fenced with five barbed wires.

This mine, which has for three years, under the management of the same superintendent,

been developing its property, recently came into the hands of men of immense financial resources whose headquarters are in London, England. They are going to continue the work so ably begun and carried on during the last three years by an American company, and will have both mill and mine at work to their greatest capacity inside of two months.

The mining structures erected upon the property are so magnificent and upon such a grand scale, so substantial in their every particular, that a description will be of interest to all quartz miners.

The Mine.

Three years ago, when the gentleman who is still superintendent and manager took hold of this property, the only improvements were a shaft 90 feet deep on the west side of the gulch, and two, one 40 feet and the other 45 feet deep, on the east side. They went to work with a determination to thoroughly explore the property and ascertain its wealth. To that end they sunk the north shaft, on the east side of the gulch, at an angle of about 71 degrees, 280 feet; at 250 feet deep a station was made, and increased the size of the south shaft to three compartments, one for the pump and two for the skips, and sunk it 583 feet, making a station at every 100 feet below the 250-foot level. The stations and chutes are large and convenient. The ore and waste is handled cheaply. The skips are loaded by ratchet chutes and discharge automatically—the waste into a bin and the ore on to grizzlies which separate the ore into fine and coarse, the fine going into the ore bin and the coarse into the 25,000-pound Gates crusher, then into the ore bin. On the 250-foot level a drift of 283 feet connects the stations at the north and south shafts, while one runs about 360 feet north from the north shaft, or shaft No. 1; from the west of this drift two rises have been carried up about 45 feet each; a crosscut is run east 100 feet, cutting a 20-foot ledge. From the drift connecting the two stations a crosscut runs west 450 feet through two ledges, one 15 feet, the other 20 feet, to and connecting with the west shaft, or shaft No. 2, thereby giving a free circulation of air throughout the entire 250-foot level; from this crosscut a drift was run 250 feet north and 150 feet south on the second west ledge. From the station at the south shaft, or shaft No. 3, a drift runs south, and several crosscuts, one of 560 feet, run to the east and middle ledges.

At the 350-foot station a crosscut has been run east 72 feet, passing through and beyond the middle ledge, which is 15 feet wide.

At the 450-foot station a crosscut runs 70 feet through the same ledge. A drift runs north 80 feet, and another south 10 feet on the same ledge. From the station west a crosscut runs 146 feet, passing through the first west ledge, which is 15 feet wide.

To perform this work, temporary hoisting apparatus with buckets were employed at each shaft. That at shaft No. 1 is still standing and in use, while that at shaft No. 3 has given way to the new hoist herein described.

This immense amount of underground work, requiring much time and thousands of money, has laid bare the quartz veins in many places, and when the great machinery of the concern is put in motion, rock will be plentiful and the bullion returns satisfactory. The mine is getting in excellent shape for handling great quantities of ore.

The Hoisting Works.

The hoisting works are a magnificent and substantial structure erected upon the east side of the ravine upon the company's property. It consists of a building 40 feet by 130 feet and 75 feet high. This building is framed with heavy timbers, well bolted, and is built upon a secure foundation of masonry consisting of four dwarf walls varying from two to four feet in thickness. It contains the air-compressors, the rock-breaker, the pump, the gallows-frame and the hoisting machinery.

The air-compressor is propelled by a four-foot Pelton wheel and is most perfect in design, having an automatic cut-off which, by its ingenious arrangement, so regulates the compressing engine that it always keeps the chamber at the pressure for which it is set. The air runs the drills and a small engine in shaft No. 2 at the 250-foot level and assists in furnishing air for the mine.

The hoisting works at shaft No. 1 gets its power from a four-foot Donnelly wheel. The hoisting gear is of the friction pattern and is good of its kind. It has done a great deal of work while the underground developments have been going on.

The Gates rock-breaker, which weighs 25,000 pounds, and has a capacity of 300 tons in ten hours, is comparatively new to this coast. It sets back of the gallows-frame and is run by a four-foot Pelton wheel. The breaker is round, with a cone inside which revolves with a wobbling motion caused by the cone being geared out of center. This gives a continuous breaking surface and reduces the rock to a size that will pass through a three-fourths of an inch ring. It is undoubtedly the largest rock-breaker in the county.

The pump, pump gear, pump bob, connecting rod, counter-shafts and other necessary machinery connected therewith make up one of as good work as was ever turned out of a foundry. The foundations for the gear, bob and counter-shaft are of solid masonry, into which they are anchored by bolts ten feet long, which, at the lower end, are eyed into heavy railroad iron, thus giving a secure foundation, which in turn will give a most steady and powerful stroke. This pump-gear is V-shaped and is capable of either a three, four, five or six foot stroke. The pump is an eight-inch Cornish plunger which is stationed at the 250-foot level. A six-inch pump raises water from the bottom of the mine to the 250-foot level.

The gallows-frame rests upon a 14 by 16 inch sill, which is bolted to the bottom of the wall of masonry upon which it stands, and is 40 feet high, 30 feet wide, and 19 feet deep on the floor, and is 10 by 19 feet at the top. It is substantially made, being composed of strong timbers 14 by 16 inches, with cross and side girths 10 by 12 inches and braces 8 by 10 inches, caps 14 by 16 inches and gallows 12 by 16 inches, all mortised and heavily bolted. In the top are fixed the two sheaves, seven feet in diameter, over which runs the 1⅛ inch steel-wire rope from the hoist to the mine. Sheaves move in their boxes as the rope winds across the face of the reel.

The hoisting machinery is of the latest pattern, V-geared, with two hoist reels each seven feet in diameter and is supplied with a Belshaw cut-off, post brakes for the reel and a foot-brake for the fly-wheel. This machine has indicators which show the position of the skips in the mine and indicators which show the opening and shutting of the six nozzles. Its capacity is 1000 tons a day.

The mine and mill are located about a half mile apart with a difference of altitude of about 250 feet, which incline of the tramway will produce momentum enough upon a loaded car going from the mine to the mill to haul the empty car back from the mill to the mine; at most, the only power required will be accomplished by two four-foot water-wheels and a single reversible reel with clutches, brakes, etc.

The Mill.

The mill belonging to this company, as has been heretofore stated, is located down the mountain half a mile at an altitude of about 250 feet less than the mine, thus making possible to practice the great economy of using the water for power that has once been used at the numerous machines at the mine. The mill is erected upon a solid foundation. A glance at its immense timbers, retaining walls, size and plan of the battery shows one its great stability and solidity. The building itself is one 108 feet long, 90 feet wide and 75 feet high, and is strongly built, the frame being made of 2 by 8 inch and 3 by 8 inch pine timbers with 2 inch packing-blocks thoroughly bolted. The truss cords are 3 by 10 inches with the rafters and purlines 3 by 8 inches all securely bolted.

On the upper side of this building is the ore-bin, over which the cars from the tramway run and automatically dump their loads. This bin is 80 feet long, 15 feet wide, and 14 feet deep, double lined with two-inch planks, and securely bolted sideways with 1½-inch iron rods. Near the bottom of this bin are doors opening into the chutes under which the Hendy feeders stand upon the upper battery floor. Upon this floor and the floor below ranging the full length, stand 12 batteries of five stamps each, or 60 stamps; each weighs 850 pounds. Each 20 stamps or four batteries run independently. These batteries are of the latest pattern and are supplied with a blind screen for convenience in repairing and cleaning. The floors of the mill are especially well built for strength and durability, yet the battery frame, to secure solidity, strength and durability, is built entirely independent of the rest of the house, and the mortar bed is made of timbers 14 feet long, 5 feet wide and two feet four inches thick, stood on end in solid rock with foundation of masonry. The single battery timbers are 12 by 24 inches, and those for the double battery are 20 by 24 inches; the knee beams, knee posts, and the guide girths are 12 by 16 inches; the battery braces are 8 by 12 inches; and the knee cords are 16 by 16 inches, all mortised and tenoned, and securely bolted with heavy and strong Norway iron bolts. The Line shaft for this machinery is six inches at the power end, and diminishes to 4½ inches, while the cam shaft has a diameter of seven inches. This battery is run by a six-foot Pelton wheel. The 24 Frue concentrators are run by a three-foot Pelton wheel.

On the lower battery floor also stand 12 aprons lined with the best copper plate. This plate is covered with quicksilver, and as the pulp passes from the stamps, the free gold is amalgamated and held there while the remainder containing the sulphurets passes through the sluices to the vanner-room on the floor below and over the 24 improved Frue concentrators by which all the valuable sulphurets are collected in tanks. We note the unusually large copper plate surface. The two driving shafts of the concentrator are two inches in diameter. The amalgam and the sulphurets, after being collected, are removed to the retort-room or to the dry-house and chlorination works as the case may be.

The Power.

The system of supplying power for the works at the mine and mill is excellent. Near the top of the hill, on the west side of Hunt's ravine, is located the first reservoir of the mine, which is supplied with water by the Amador Ditch Co. This reservoir supplies three pipelines to the mine machinery, consisting of one hoisting works at the north shaft, one hoisting works at the south shaft, one sample, one stamp-mill, one six-inch pump, one eight-inch pump, one mine-blower, two blacksmith's blowers, one Gates crusher, one compressor, and pipes to all buildings for fire purposes. An 11-inch pipe furnishes water for the four-foot Pelton wheel of the compressor and for the 10-inch wheel which runs the blower in the blacksmith shop. Another line about the same size supplies the hoisting works and pump at shaft No. 1. The main pipe-line which supplies the large Pelton wheels for the hoist, the pump and the rock-breaker is of 22-inch steel pipe strongly made and carefully laid. These pipelines are about 900 feet long and have a fall of 160 feet from the reservoir, giving plenty of power to run the machinery. After the water is used at the hoisting works it is collected in a reservoir near by and carried in a ditch of ample capacity to a large reservoir upon the hill above the mill. This ditch follows the hillside around 3500 feet, with a fall of one-quarter of an inch to the rod, to the mill reservoir, which is 10 feet deep, 100 feet wide, and 250 feet long. From the reservoir an 18-inch steel pipe-line is carried 800 feet to the mill to furnish power for the batteries, concentrators, and cleanup pans; and a branch six inch pipe to run the electric plant for lighting the mill, after which the water goes into the two 10,000 gallon tanks.

As interesting facts, it may be noted that the company has made ample precautions in case of fire. They carry over $50,000 insurance on the works. They have laid over 14,000 feet of pipe of different sizes, and have an immense stock of tools and supplies of all kinds. There is over 600,000 feet of lumber in the different works.

Sample-Mill.

One of the very important, and in fact an indispensable part of the equipment of the mine, is the sample-mill, which is located in a house 16 by 26 feet, with three floors. On the upper floor is a small Gates crusher; the next is the battery floor, where a single stamp of 750 pounds is kept at work; the lower floor is fitted up with copper plates and sample kegs for the sulphurets.

Blacksmith-Shop.

Another of the important equipments is the blacksmith-shop, 30 by 40 feet. The shop has two circular iron forges, one for the heavy work and one for the tool-sharpening. The heavy forge is supplied with a hanging crane, and the entire shop is furnished with a full assortment of necessary tools for all kinds of general work, and skip and car-building. All the ironwork used in the construction, except castings, has been made in this shop, while the mining tools, skips and cars turned out are models of perfection.

Investment and Returns.

Already a quarter of a million dollars have been invested in improving this property during the three years, and it will take $50,000 more to put it in such condition that they will be able to work both mill and mine to their fullest capacity.

The surface of this mining property is such that ample convenience is secured for building sites, lumber-yards and dumps, and the six ledges on the property are easy of access, in fact heavy teams can drive almost to the mouths of the shafts.

The character of the work all through the mine is such that the expense and delay for repairs will be very small. The almost inexhaustible supply of ore exposed, all ready to extract, insures constant employment for the 60 stamps.

This investment will yield a good return. Enough pay-rock has been uncovered to keep both mine and mill steadily at work to their fullest capacity for years. The proximity of this ore to the surface makes it comparatively cheap to take from the mine, and the economy practiced in utilizing the water for power will make it possible to reduce the ore for $2 a ton, this including every expense. This mine makes its estimates and places its dependence upon the low-grade ores, which assay about $4 to $6 a ton, though they have some ore which will run much higher. Their machinery will work up 200 tons per day. It can be readily seen that the net profit, working $5 ore, should be $216,000 a year.

ACADEMY OF SCIENCES.—The California Academy of Sciences has applied to the Superior Court for the right to mortgage its premises on Market street, near Fourth, where the new building is now being erected, for $400,000. The reason for this application is that the money is needed to complete the building, and the society cannot now get the $400,000 legacy left it by the late James Lick, because it is in litigation, and the trustees refuse to pay it over without taking a mortgage on the whole property, so as to secure themselves against any possible adverse construction of the section in Mr. Lick's will that sets forth the bequest. The Trustees of the society apologize for the necessity of the loan by saying that they had no idea when they commenced the building that there would be any doubt about getting the money as soon as needed.

REBUILDING SMELTERS.—The work of rebuilding the smelters of the Eureka Consolidated M. Co. at Eureka Nev., has commenced. The short delay since their destruction by fire was occasioned by a difficulty in arranging for the necessary quantity of building materials. This will all be shipped from San Francisco. A large shipment of silver bullion has just been made and another of lead left on Monday. This was saved with the refinery, the only building which escaped destruction at the time of the fire.

ALFRED POETT of Santa Barbara has been engaged as consulting engineer of the Nicaragua Canal.

The Northern Counties of California.

NUMBER 8.

Mineral Products of Economic Value.

[Written for the PRESS by JAMES H. CROSSMAN.]

The northern tier of counties in this State are not deficient in veins and deposits of base metal ores. Iron, copper, mercury, chrome, manganese, antimony, etc., abound, as well as nearly all of the minerals that are used in the arts. Coal, petroleum, asphaltum, coal oil, illuminating gas, building stones of many varieties, and of superior quality, lime, cement, gypsum, sodas, and alkaline earths for chemical and industrial purposes occur in different localities. There are also innumerable springs of medicated mineral waters, both hot and cold.

Mineral Springs.

The celebrated mud springs on Mud creek, a tributary of the McCloud river, in the southern portion of Siskiyou county, are rapidly acquiring a deserved reputation for their almost miraculous cures of chronic skin diseases, blood poisons, rheumatic and gouty affections. Dr. Winslow Anderson, Professor of Chemistry, recently read an able treatise on the "Natural Mineral Waters of our State," before the Medical Society of California. In closing, he said: "I do not hesitate in predicting the evolution of California into one of the world's sanitariums."

There is no portion of the American continent that contains a greater variety of mineral springs, both hot and cold, than the region under consideration. These aqueous products, manufactured in Nature's laboratory by Nature's chemist, under the all-powerful influences of subterranean dynamic forces and chemical action, contain medicinal and curative properties that alleviate, if not cure, most of the ills that human flesh is heir to. Why should our invalids, when they so much require rest, visit Europe for medical treatment when they have at our very doors medicinal springs that show by analytical tests the same mineral formulæ as those that they visit in distant lands?

For the architect and builder, this region contains unlimited quantities of all the rocky formations that are essential for the construction of our habitations, palaces, hotels, public buildings, pavements and monumental structures for both the living and the dead.

A Map Needed.

When a detailed topographical, geological and mineralogical survey and a map with an explanatory text-book shall have been made, the illimitable resources of not only this region but of all California will be better understood.

The map should show in detail the watershed, contour lines, river gradients, elevations, reservoir sites, arid, swamp and overflowed lands, timber lands, formations, stratigraphical and mineralogical features, defining the mineral belts as well as the dead-river system of Pliocene channels. The accompanying report or text-book should give accurate data as to the rivers' maximum and minimum grade and flow, depth, velocity of stream, precipitation at the several points, temperature—maximum, minimum and the mean. The soils of the several localities should be analyzed in order that the agriculturist may select that section which is best adapted to his pursuit. The waters from the several mineral springs should have careful analytical tests. The text-book should show all of this and as much more as would come within the province of the survey.

The Mining Bureau.

Our State Mineralogist, Wm. Irelan Jr., is eminently qualified to fill the position as chief of this department. His able administration of the affairs of the California State Mining Bureau during the past fiscal year; the immense amount of work accomplished by him with an insufficient appropriation and a small corps of field and laboratory assistants, was evidently realized and appreciated by our State Legislature, as at the last session a bill was introduced appropriating $100,000 to the Bureau. It was given with the distinct understanding that seven-tenths of this amount should be expended in inaugurating and prosecuting a State Geological Survey as herein outlined and presented. The bill passed both houses, was signed by the Governor and became a law; but through some technical error in its copying the money is not as yet available. Therefore this important work has not as yet been commenced.

Much has been done heretofore by both State and U. S. engineers in furtherance of this object, but for want of time and necessary funds, the main issues have been neglected. No detailed map has been completed. In fact, there has been nothing more accomplished than a topographical survey in part of our State of which portions have been triangulated from base lines to prominent points, with details of intermediate mineralogical and geological features unascertained if we can judge from a communication in a recent issue of your paper signed by Geo. F. Becker, U. S. Geologist in charge. In that he asks for information from readers, miners, school-teachers, etc., as to fossils that may enable him to complete a satisfactory map of the Gold Belt of California, which important points he should have ascertained long ere this from his assistants in the field.

Judging from the article referred to, the completion of the United States survey and map is

in the dim distant future. So far as the work has progressed, it is of no immediate practical benefit to any one.

What we require is a prompt, thorough, and careful survey of our State by our State engineers, with map and text-book. When this shall have been completed and the Oregon and California system of branches as feeders for the main trunk line shall have been extended, this hitherto isolated region will be rapidly developed and its mineral and agricultural products add largely to the general prosperity of our State and nation. It is useless to wait for the slow and red-tape movements of our United States engineers. Of the several northern counties of our State, we have valuable and accurate county maps, but nothing touching on the topography, geology, or mineralogy of the region. The map of Siskiyou county by I. M. Davidson, Deputy U. S. Mineral and County Surveyor, is especially deserving of note. Surveyor Davidson possesses a fund of information relating to the rocky formation through and over which he has run his lines. This information he cheerfully imparts, and, undoubtedly, could assist Mr. Becker in pointing out fossiliferous beds or stratigraphical features that Major Powell's engineers in the field have no knowledge of. Whenever Comptroller Dunn audits the bill of our State Mineralogist under the appropriation made by our State Legislature, the work of the survey will commence with a competent corps of both field and laboratory assistants. In the laboratory, analytical tests of waters and earths will be made, the tensile strength of building stones ascertained, and assays of ores made.

Siskiyou County Springs.

In Siskiyou county, at a point 3½ miles northeast of Dunsmuir, near the sixteenth crossing of the Oregon & California railroad, 20 miles from Mount Shasta, we enter the mineral-spring belt or region of mineral waters. I will briefly describe a few of the springs as a type of the many.

Spring No. 1—Water cold; flow 4 inches, miner's measurement; acidulated and ferruginous, containing iron and carbonic acid gas; said to be good for the kidneys and other diseases incidental to this organ, indigestion, etc. This spring issues between contacts of basaltic lava and tufa which is underlaid by trap. No analysis.

No. 2 comprises quite a number of springs of the same character, all within an area of 500 or 600 feet. Its minerals are sulphur and iron; no analysis.

No. 3 is Steamboat or Furlong's spring on Hedge creek; elevation 2700 feet; effervescent and sparkling; evolves carbonic acid gas in such quantities that it can only be inhaled for a moment, and kills insects that approach or fly over it, as well as small animals that approach the pool. It is said to be efficacious in kidney diseases and nervous affections, and takes its name from the blowing or puffing noise that is heard for a considerable distance as the gas escapes. The waters are used by the inhabitants who reside in the vicinity in place of yeast to raise their bread. No analytical test.

No. 4—Bilicky soda springs. Water effervescent and sparkling; flow light; taste pleasant, slightly acidulated. With sugar, makes a pleasant lemonade.

In Modoc county there are large areas of hot as well as cold springs, having medicinal properties. With the medicated springs of Humboldt, Mendocino and Del Norte counties I have no personal knowledge.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

LAST Saturday evening 330 men were discharged from the Southern Pacific's shops at Sacramento, 160 of whom were skilled mechanics.

THE INDIANS in the United States who can read Indian languages number 10,027, and 23,498 can read English.

Practical Treatise on Hydraulic Mining.

BY AUG. J. BOWIE, JR.

This new and important book is on the use and construction of Ditches, Flumes, Dams, Pipes, Flow of Water on Heavy Grades, methods of mining shallow and deep placers, history and development of mines, records of gold washing, mechanical appliances, such as nozzles, hurdy-gurdys, rockers, undercurrents, etc.; also describes methods of blasting; tunnels and sluices; tailings and dump; duty of miners' inch, etc. A very practical work for gold miners and users of water. Price, $5, post-paid. For sale by DEWEY & Co., Publishers, 220 Market St., San Francisco.

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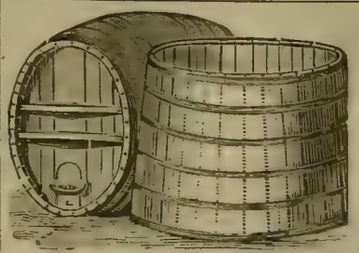
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THE BUFFALO CONSOLIDATED GOLD Mining Company, Sierra City, Cal., Ernest Busch, Superintendent. Stock divided into 600,000 shares at $1 per share. The property comprises 5 locations. Ore finely decomposed, carries coarse gold. Size of ledge: Tunnel No 1, 32 ft.; No. 2, 9½ ft.; No. 3, 10 ft. Fine black decomposed rock interspersed with white quartz. New 10-stamp mill run by a Pelton Wheel, blacksmith shop and boarding house. Stockholders: Ernest Busch, Hugh Murray, Frank Cook, J. G. Lee, Henry Carpenter. For further information apply to Ernest Busch, Sup't, or Hugh Murray, Sec'y.

THE CALIFORNIA CONSOLIDATED Gold Mining Company, Sierra City, Cal., A. Schubert, President; Alvin Fischer, Secretary; A. Leffer, Superintendent. Divided into 300,000 shares at $1 each. Property comprises two locations. Ore assays $7 per ton, average. Coarse gold, solid rock; vein from 15 inches to 2 feet wide Tunnel No. 1 in 120 feet, and prospects well. No. 2 just begun. Stockholders: Alvin Fischer, A. Schubert, Gus Fischer, F. L. Fischer, Anton Fischer, Fred Fischer. For information concerning stock, etc., apply to F. L. Fischer, Sierra City.

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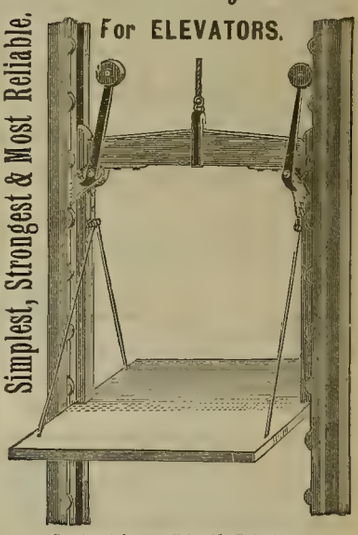
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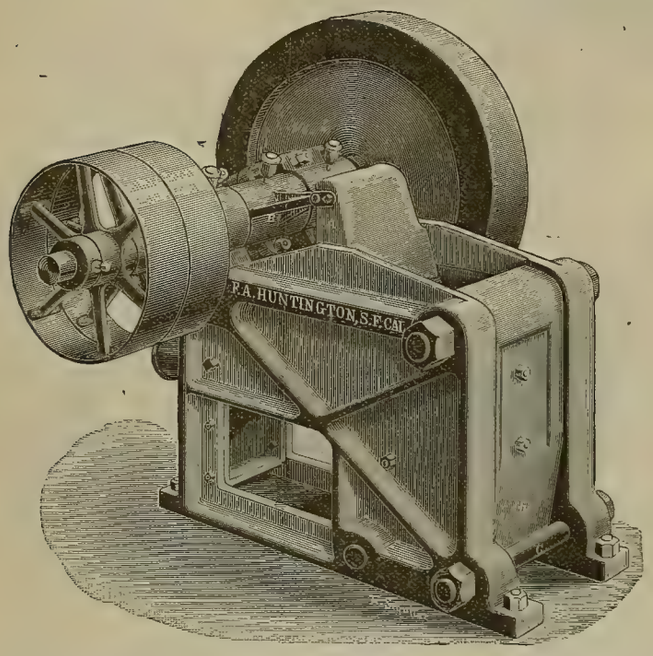
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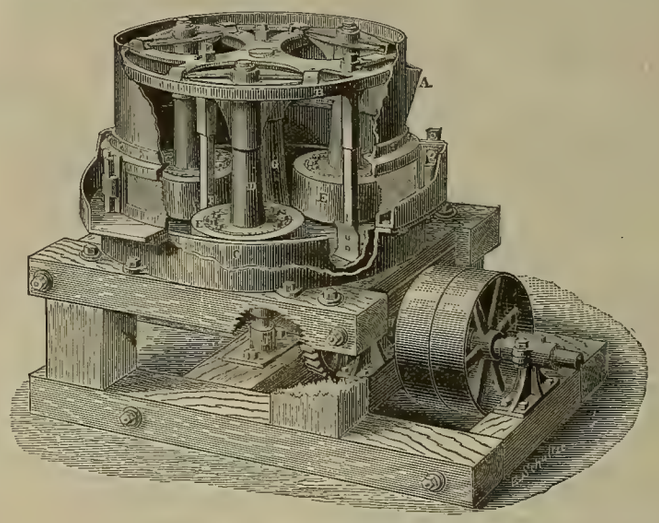
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Huntington's Improved Rock-Breaker.

The main features of this machine are strength, ease of adjustment and simplicity of construction.

The movable jaw *A* is worked by the eccentric *B* and is pivoted at the bottom. The stationary jaw *D* is secured at the top by a bolt running through it, and at the bottom bears against the heavy bolt *C*. The main wear is, of course, at the bottom of a breaker of this form, and the wear is easily taken up by inserting a plate between the bolt *C* and the jaw *D*. The jaw is thus swung in at the bottom, and the opening where the ore passes through is made correspondingly smaller. As will be seen by the cut, this machine is of very simple construction and is strong and durable.



F. A. HUNTINGTON'S
Centrifugal Roller Quartz Mill.

The following will explain the above cut:

The ore and water being fed into the mill at the hopper *A*, the rotating rollers and scrapers throw the ore against the ring die, where it is crushed to any desired fineness by the centrifugal force of the rollers as they roll over it.

The water and pulverized ore are thrown against and through the screens when fine enough. The discharge is so perfect that it makes little or no slimes, and leaves the pulp in good condition for concentration. The rollers are suspended, leaving a space of one inch between them and the bottom of the mill, thus allowing them to pass freely over the quicksilver and amalgam without grinding it or throwing it from the mill, while it agitates it sufficiently to make amalgamation perfect. For wet crushing and gold saving it has no equal.

I claim especial merit in that feature of this system *which prevents* ALL FLOURING of gold and quicksilver, and the consequent loss of gold that attends stamp milling.

For the economical working of ore that contains sulphurets, I particularly claim the adaption of this mill. The rotary method of crushing the ore so granulates the pulp (which is discharged the moment it is crushed) that a complete concentration of sulphurets is rendered most easy.

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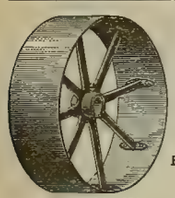
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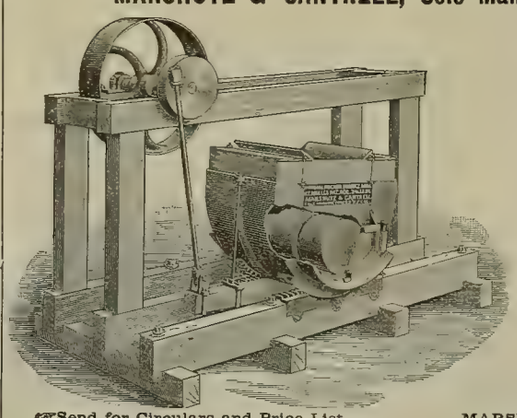
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4. The power to drive it is less than one-half of stamps.
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6. There is no wear except on shoes and dies.
7. In point of amalgamation it is superior to any other machine in use.
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Mining Personals.

C. E. Cahn, from the Columbus borax works, Nev., is visiting the city.

CAPTAIN JOHN KELLY, Supt. of the Bodie mine, is on a visit to San Francisco.

W. S. Godbe, general manager of the Pioche Con. & Yuba M. Co., Nev., is visiting Salt Lake City.

L. M. Warden, the president of the Bituminous Rock Co., at San Luis Obispo, is in San Francisco.

Phil Nichols, formerly of Colfax, is superintendent of the Fall Creek placer, San Miguel, Colorado.

John B. Davidson and George Anderson, both panmen at Pinos Altos, Mexico, have returned to California.

W. C. Price, superintendent of the North Belle Isle and Navajo mines, Tuscarora, Nev., has come "down to the bay."

J. M. Harper, one of the gentlemen from New York who are going to bond the Mountain mine, Sierra county, is in Sierra City.

Wm. Jones, formerly of Gold Run, Placer Co., is superintendent of the Great Arkansas Mining Company at Texas Creek, Colorado.

A. W. Havens, Joseph Marks and Geo. R. Wells of this city have been inspecting the new mill of the Occidental mine on the Comstock.

John German of North San Juan, Nevada county, was at Downieville, Sierra Co., last week, inspecting his valuable drift mine below the Mt. House.

E. B. C. Hambly, a mining engineer of Rockwell, N. C., has recently been examining the Cleveland mine, above Big Bar Bridge, Amador county.

J. B. Randol, the general manager of the New Almaden quicksilver mine, is one of the projectors of the proposed Twelfth-street line of cable cars in Oakland.

Mr. Madden, formerly superintendent of the Nevada Ditch and Reservoir Company, is general manager of several English companies operating on the San Miguel river, Colorado.

Mr. A. C. Dubois, the author of several interesting articles in the MINING AND SCIENTIFIC PRESS, on "Mexican Mines and Miners," is now assayer at the Pinos Altos mine, Mexico.

James Pierce, formerly underground foreman of the New Almaden quicksilver mines, lost his life at Triumpho, Lower California, July 12th, in endeavoring to rescue five miners who were cut off by fire in Argimarra silver mine.

R. P. Keating, superintendent of the Savage mine, G. Kerwin, superintendent of the Best and Belcher, J. Thomas, foreman of the Crown Point, and J. Conner, assayer of the Chollar mine, have been visiting the mines in Tuscarora district, Nev.

Col. R. F. Looney of Memphis, Tenn., and Judge R. E. Reese of St. Louis, Mo., have just left Baker City, Oregon, after having purchased the Baisley mine, about six miles west of that place. The price paid is said to have been $200,000. This is the largest mining sale Oregon has experienced.

Mr. A. E. Roberts, who has been for a year past assayer at the Pinos Altos mine, Mexico, is again in San Francisco. At one time Mr. Roberts spent a year in gold mines in China which are being worked by the Government, and unless he finds more congenial employment here may return to that country.

Mr. C. H. Aaron left this week to take charge, for an Eastern company, of the Santa Lucia mills, which is about nine miles from Tegucigalpa, Honduras. He will look into the feasibility of leaching the ore. The mill now has ten stamps, but it is in contemplation to enlarge it. This is Mr. Aaron's second visit to the mines of Honduras.

Mr. C. A. Stetefeldt, the inventor of the Stetefeldt furnace, and author of "The Lixiviation of Silver Ores with Hyposulphite Solutions," has left New York to take up his residence in San Francisco. Mr. Stetefeldt is one of our best-known mining engineers and metallurgists, and was for many years occupied on this coast. For the past few years he has been living in New York.

Mr. E. W. Peet, who 20 years ago was mining in San Diego county with one of the editors of the PRESS, was in the city this week. He is operating the Whittle gold mine at Angels camp, Calaveras county. Mr. Peet says the shaft is down 200 feet and two levels have been run. The ledge runs $10 to $12 per ton, though some rock has paid $25. The mine has paid expenses with a small Huntington mill. The ledge is widening and prospects improving.

F. C. Poisson, who was formerly with the Odessa Mining Company of this State, has recently returned to San Francisco from Johannesburg, in the Transvaal, South Africa. He states that the discoveries of gold there have caused a growth in the surrounding country equal to the old-time mining growths on the Pacific Coast. The ledges carry gold ore, and it is worked by stamps. There are 180 companies, running 450 stamps, and 1500 more stamps are in course of erection. In May last the yield for the month was $648,000. These are known as the Winwatersrandt gold-fields. It costs $7 per ton to mine and mill the ore, which will average $10, though some runs much higher.

Theophilus Masac, president of the Lower California Mining Company controlling the Masac mining concession in the Real del Castillo district, is in this city. The concession covers 115 square miles of mining lands, in which tract the company owns 30 mines, both placer and quartz. After many futile efforts to obtain white or native laborers for the mines, the company was compelled to look elsewhere than in Lower California for experienced miners. Owing to these circumstances Mr. Masac was enabled to make a contract with several Chinese firms and companies, by virtue of which the mining properties of this company are now being opened up. The name of the Chinese corporation which has taken hold of these concessions is the On Yick Co. This company has unlimited capital to prosecute both enterprises. About 600 miners will be employed.

The Astronomical Society.

The Astronomical Society of the Pacific met at the Lick Observatory, Mount Hamilton, last Saturday. It was announced that the report of the solar eclipse of last January, now being printed by order of the Regents of the University, has reached page 603, about a third of the volume. It contains reports from more than 150 persons, distributed at 25 different observing stations.

C. F. Crocker has offered to bear the expense of an expedition from the Lick Observatory to Cayenne, South America, next December, and it is expected at that time to confirm and extend some of the discoveries made at the last eclipse.

Hon. Joseph A. Donahoe of Menlo Park has offered the Astronomical Society of the Pacific to establish a medal to be given to the first discoverer of every unexpected comet, and to the first person making a precise observation of a telescopic periodic comet at any one of its expected returns. This medal is intended solely as a recognition of merit and to commemorate the discovery, and is not designed in any sense as a reward. Mr. Donohoe also offered the gift of a fund sufficient to maintain such a medal in perpetuity from and after January 1, 1890. The society has gratefully accepted the offer.

No application for the award of the medal is required. It will be given as a matter of course to the acknowledged discoverer of each new comet. It is, however, prescribed that a letter should be addressed to the director of the Lick Observatory, which communication must contain all the particulars of the first observation.

The full conditions on which the awards will be made will shortly be printed in the various scientific journals and in the publications of the Astronomical Society of the Pacific, where they can be found by those interested.

There were too many papers presented to allow all of them to be read; and accordingly, some were postponed till the next meeting. The papers read, either by title or in full, were: "The Possibility of Photographing the Corona in Full Sunshine," by Mr. Kuler; "The Orbit of Comet Barnard, June 23d," by Mr. Leuschner; "The Occultations of Jupiter to be Expected in 1889," by Mr. Hill; on "A Photograph of the Milky Way near Jupiter, Taken the 29th inst., with 1 hour and 48 Minutes Exposure," by Mr. Barnard. Another paper was: "The Real Shape of the Nebula, Which we see as a Spiral," by Mr. Holden.

The following persons were elected to active or life membership at the meeting: Ex-United States Senator James G. Fair, Mr. Robert D. Fry, Mr. Rudolph E. Voight, Mr. I. P. Belknap, Mrs. William Alvord, Mr. Alexander Montgomery, Mrs. Alexander Montgomery, Mr. John Partridge, Dr. Geo. C. Pardee, Miss Fidelia M. Jewett, Miss L. J. Martin, Mr. Lester L. Robinson, Mr. Andrew R. Forbes, Mr. John R. Spring, Judge John H. Boalt, Mr. Robert H. White, Mr. Horace L. Hill, Mr. Joseph G. Lavery, Dr. W. B. Lewitt, Dr. L. L. Dunbar, Mr. Charles Webb Howard, Mr. James Perry, Jr., Dr. W. J. Sullivan, Mr. Darius Ogden Mills, Captain Charles Goodall, Mr. Adam Grant, Mr. James D. Grant, Albert Raymond, Lawrence V. Pierson, T. W. Fenn, Rev. Robert McKenzie, Hon. James M. Getchell, J. C. L. Wadsworth, Mr. Arthur W. Foster, all of San Francisco; Hon. Alf L. Tubbs, Mr. J. W. McClymond, Mr. Charles G. Yale, Mr. George H. Strong, ex-Governor George C. Perkins, Mr. John C. Billock of Oakland, Cal., Mr. Charles R. Tisdall, Alameda, Cal., Mr. Charles W. Friend, Carson City, Nev., Mr. C. H. Clement of Livermore, Cal., United States Senator John P. Jones of Nevada, Mr. Henry V. Alvord, San Jose, Cal., J. Senor Felijee Valle, Senor Manuel G. Prieta, Director Angel Auguino, Fedona Quintino Camitto Gonzales, Francisco Rodriquez Rey of the National Observatory at Taculay, Mexico.

After the adjournment of the society the members looked at the various objects of interest shown by the astronomers of the observatory. In this society the annual dues are $5 and there is no initiation fee. A life membership is $50. The publications are sent to every member, and three of its six meetings are held in San Francisco.

COTTON-MILLS AT THE SOUTH are constantly being multiplied. It is said that the State of Georgia alone has 55 cotton-mills, and that the city of Augusta contains 13 cotton manufacturing plants, which represent $5,500,000 of capital. It is the opinion of the *Manufacturers' Record* that the present year will be the greatest thus far in the development of the industries of the South.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

From the official report of U. S. Patents in DEWEY & CO.'s Patent Office Library, 220 Market St., S. F.

FOR WEEK ENDING JULY 23, 1889.

407,463.—ROTARY HARROW—Ansley & Boyd, Medical Lake, W. T.

407,511.—THRASHER ATTACHMENT—J. D. Burkhart, Dayton, W. T.

407,343.—BULLET MACHINE—L. P. Garcin, S. F.

407,542.—GRAIN SEPARATOR—A. Mecklem, Colfax, W. T.

407,559.—HOOP CLAMP—Asa G. Wells, S. F.

407,389.—CABLE R. R. SIGNAL CROSSING—R. H. Wright, S. F.

The following brief list by telegraph, for July 31st, will appear more complete on receipt of mail advices:

California.—William F. Toothaker, San Francisco, hydraulic elevator; John Rosasco, Healdsburg, assignor of half to John Cuneo, San Francisco, fruit-pitting machine; Hugo Roensch, assignor to A. Schilling, San Francisco, paper box; John Comer, assignor of three-fourths to H. Berger and E. Aldersley of Anderson, and F. H. Darin of Redding, lubricator for shaft bearings; Wm. M. Brown, Jr., Sacramento, pipe coupling; Wm. C. D. Body, Grass Valley, safety clutch for cars on inclined railway.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Results of Injunctions.

EDITORS PRESS:—At the Dutch Hill mine, Savercool Brothers showed your correspondent works said to have cost $750,000, but now in a state of ruin owing to injunctions. Forty acres have been washed and there is plenty more of pay dirt. They are separated by a canyon of three miles from the nearest point on the river and by more than 70 miles from the Sacramento valley—the nearest point where debris can do any damage. Others told of a party of 16 poor men who worked 12 years to open a hydraulic mine, a part working for wages to supply balance with mining stores. Just as they were ready to begin work they were enjoined.

Throughout this part of the country farmers are suffering for lack of the market that the mines used to furnish and join the miners in the desire that some measures may be taken by which those mines shall be worked that can be without detriment to other property, and that engineering be undertaken to find where debris can be disposed of to advantage. On returning to Oroville, a visit to Cherokee will give more reliable data concerning reports that they have solved the debris question by a levee system introduced by the superintendent, and that they have realized a handsome profit from lands bought by them for the purpose of disposing of tailings and quieting injunction suits. This seems to be a question vital to this vicinity and it appears as though the law was working great and unnecessary injury. F. S. C.

Taylorville, Plumas Co.

The State Museum.

Among recent additions to the collection of the California State Mining Bureau are the following:

Lignite, from a large vein on Yonker's ranch, Del Norte Co., Cal. R. W. Miller.

Lignite, found over several miles of country in the Hyampum valley, Trinity county, Cal. W. C. Chapin.

Iron ore; magnetite, partly loadstone or "natural magnet," from two large ledges in San Bernardino Co., Cal. H. W. Lake.

Cobalt ore, with argentite and native silver, San Gabriel, Los Angeles Co., Cal. Wm. McEwen.

Gold on quartz crystals, Keystone mine, Humbug Creek, Siskiyou Co., Cal. D. Ream.

Fossils from the basin of the Umpqua river, Oregon. D. C Stone.

Catlinite, "Indian pipestone," Pipestone Co., Minnesota. Minneapolis Academy of Sciences.

Nine specimens of gold quartz and silver ores from the Te Aroha district, New Zealand. Prof. F. D. Brown.

Sapphires from El Dorado Bar, Montana. Geo. Weitbrecht.

Native bismuth from near Salt Lake City, Utah. W. H. Schamp.

Opal in matrix, Honduras. J. Weyl.

CAREFUL WHAT HE DRINKS.—It is said that Gov. Pennoyer of Oregon is supplied with drinking-water from a spring by his milkman who brings the wholesome liquid every day in cans.

Successful Patent Solicitors.

As Dewey & Co. have been in the patent soliciting business on this Coast now for so many years, the firm's name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific Coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this Coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That this is understood and appreciated, is evidenced by the number of patents issued through their SCIENTIFIC PRESS Patent Agency (S. F.) from week to week and year to year.

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A NEW EDITION.

A Practical Treatise on the Manufacture of Bricks, Tiles, Terra Cotta, etc., including Hand-Made, Dry Clay, Tempered Clay, Soft Mud, and Stiff Clay Bricks; also Front, Hand-Pressed, Steam-Pressed, Re-Pressed, Ornamentally Shaped and Enameled Bricks, Drain Tiles, Straight and Curved Sewer and Water Pipes, Fire Clays, Fire Bricks, Glass Pots, Terra-Cotta, Roofing Tiles, Flooring Tiles, Art Tiles, Mosaic Plates, and Imitation of Intarsia or Inlaid Surfaces, comprising every Important Product of Clay employed in Architecture, Engineering, the Blast Furnace, for Retorts, etc., with a History and the Actual Processes in Handling, Disintegrating, Tempering and Moulding the Clay into the Shape, Drying Naturally and Artificially, Setting, Burning with Coal, Natural Gas and Crude Oil Fuels, Enamelling in Polychrome Colors, Composition and Application of Glazes, etc., including Full Detailed Descriptions of the Most Modern Machines, Tools, Kilns, and Kiln Roofs Used. By Charles Thomas Davis, Second Edition. Thoroughly Revised. Illustrated by 217 engravings, 501 pages. 8vo.

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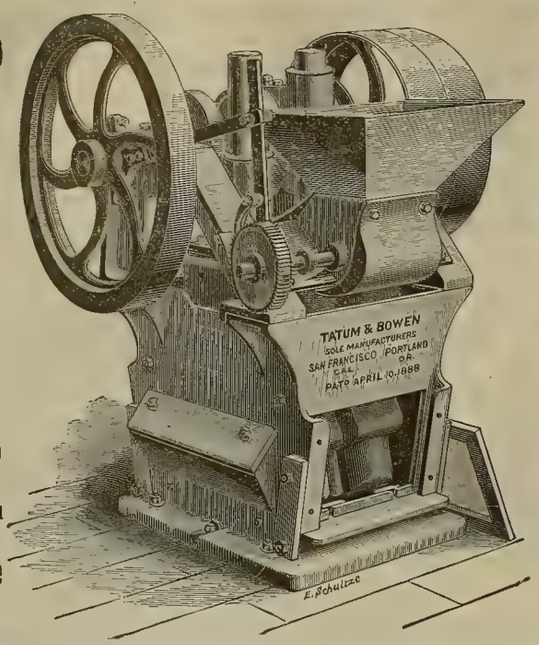
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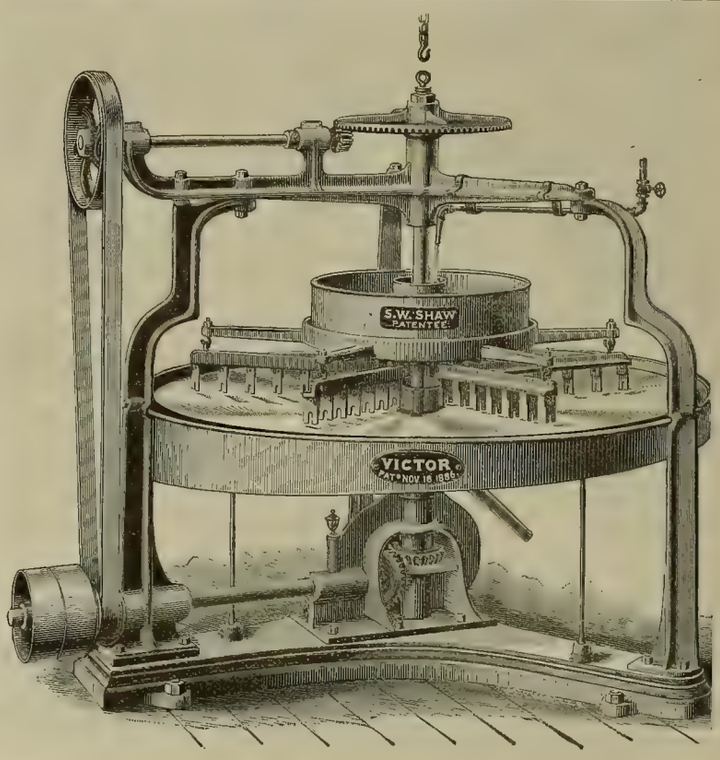
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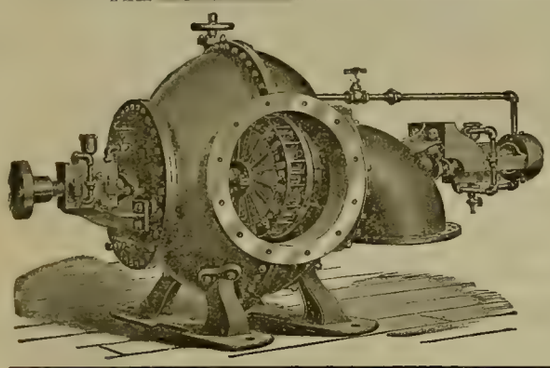
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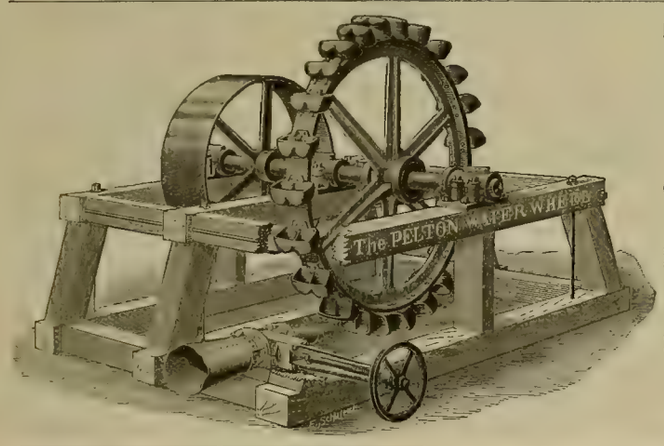
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Aug. 1, 1889.

General business continues slow, although it is reported there is a steady increase in the volume of goods going out. The principal call is still of an assortment character. The trade looks for a decided improvement in the demand toward the middle of August. This opinion is based on the known small stocks carried by interior retail dealers, and the general desire by them to stock up. The many fairs will also attract trade.

In the local market money continues easy, with only a moderate call as yet for crop purposes. It is stated that considerable money has been engaged for use later on, but not to the extent that usually obtains at this season of the year. The comparatively light call is due to more available money in the interior. Remittances continue light, but not more so than usually rules at this season of the year. Latest issue of *Money* to hand reports that gold imports at London from Melbourne had about ceased, and that arrangements had been made to send by the last of this month (August) £2,000,000 from Melbourne to this city for crop purposes. This money no doubt will be diverted here for exchange purposes in expectation of a low rate for sterling exchange on England.

The imports of treasure by sea the past week were as follows: Coin, $10,499; Mexican dollars, 32,927.

The July dividends compare as follows:

	1888.	1889.
Banks	$439,250	$470,000
Gas and Water Co's	138,300	132,600
Insurance Co's	95,500	59,000
Street R. R. Co's	26 250	17,500
Powder Co's	27,000	27,000
Mining Co's	497,920	248,500
Miscellaneous Co's	49,750	77,750
Totals	$1,273,970	$1,032,450

The falling off in the Mining Companies is due, it is said, chiefly to the stock being out on the public, and manipulators desire to buy it back at low figures. The nine savings banks of the city have paid their semi-annual dividends to depositors this month, amounting to upward of $1,000,000, thus making a disbursement of over $2,000,000 in dividends among the people this month.

Mortgages recorded last week were 81; consideration $233,120. The rate of interest was unchanged.

In the speculative markets local securities, outside of powder stocks, have been quiet. The deal in these stocks does not as yet cause much enthusiastic buying by outsiders. The sugar stocks appear to be well dealt out on the public, and consequently sugar is falling and dividends by the Hawaiian Commercial Company and the Hutchison Sugar Company are expected to be of short duration. Wheat options are still attracting attention, the attractive fluctuations bring in outside operators. Mining stocks, after dragging for some time, shrunk on an average fully 20 per cent. The decline brought out margin stock.

MEXICAN DOLLARS—There is quite a call for Mexican dollars for shipment by the steamer to leave on Saturday, August 3d. The price at which they were sold was 74¾ for new and 74¼ for old.

SILVER—The action of the market in London looks as if silver is being made more speculative. The price, after receding, strengthened some and then jumped ⅛d. The New York market has moved slightly in sympathy. With us the market is kept quite strong under moderate receipts and a good demand. The buying is for India, China and Japan. Sales were made at 92⅝@92¾, but on Tuesday 92⅞c was paid, with another advance reported to have been paid yesterday by an anxious buyer. The higher prices here in comparison with New York are naturally drawing freer shipments here, or at least it is so claimed.

London cables quote silver bullion at 42¾d; New York telegrams quote 92⅜c, and in our market sales were made to-day at 73c.

QUICKSILVER—Receipts the past week aggregate 149 flasks. The exports the past week were as follows: Auckland, 40 flasks; South America, 10. The market has continued fairly steady. The consumption on the coast, taken as a whole, shows an increase over this time last year.

BORAX—Receipts the past week aggregated 2189 ctls, and exports by sea to New York 2468 ctls, and to Chicago, 213 ctls via Victoria, B. C. The market is reported firm, with a good consumptive demand at the East.

CHROME ORE—The shipments the past week aggregated 342,330 lbs via Cape Horn.

LIME—Receipts the past week aggregated 5482 bbls, being a decided increase on preceding weeks. The home demand is reported to be increasing. It is claimed that there is some cutting in prices.

LEAD—The market is unchanged, although a better feeling is reported at the East. The consumption on this coast is claimed to be fully up to last year.

TIN—Imports the past week aggregate 8801 boxes plate, and the exports by sea, 1090 lbs to Victoria, B. C. The market is barely steady, with some shading in pig under fair offerings on spot, and for shipment, and not quite so urgent for consumptive call.

COPPER—The market is without essential change in quotations. The tone appears to be stronger.

COAL—Imports the past week are as follows: From Nanaimo, 2760 tons; Liverpool, 3142; Tacoma, 1812; Swansea, 1854; Departure Bay, 5900; Seattle, 2814; Coos Bay, 1250; total, 19,532 tons. The market for both spot and to arrive is without particular change to note. The tone does not appear to be quite so strong, and with heavy arrivals prices may shade off. For prompt shipments there is nothing new to report.

IRON—Imports the past week aggregate as follows: Foreign, 450 tons; Irondale, 110 tons. The spot market gave signs of improvement, but with free imports the tone is weak and easy. The consumption continues light. Eastern and foreign advices report strong markets. The production in the United States for the first half of 1889 was 4,107,000 tons against 3,886,004 tons for the like time in 1888. Nine years ago the total production for 12 months was not quite 4,000,000 tons, so that for the first six months this year it was greater than for the 12 months in 1880.

The following are the latest comparative quotations f. o. b. at Glasgow:

F. o. b. Glasgow, July 19, '89.	July 26, '89.	July 24, '88.
No. 1 Coltness 57s 6d	57s 6d	47s
" Langloan 55s	56s 3d	44s
" Summerlee 55s 6d	56s	46s 6d
" Gartsherrie 53s 6d	55s	44s
At Ardrossa		
No. 1 Eglinton 44s 6d	45s 9d	38s 6d
" Glengarnock .. 53s 6d	53s 6d	42s 9d
" Dalmellington .. 46s	47s	40s

COKE—Imports the past week aggregate 1410 tons. Notwithstanding the free arrivals the market holds fairly steady, owing to all received having been placed to arrive.

Eastern Metal Markets.

By Telegraph.

NEW YORK, July 31, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	42 5-16	92½	$11 90	$3 87½	$19 85
Friday	42 3-16	91½	11 50	3 87½	19 60
Saturday	42 3-16	91½	11 60	3 90	19 60
Monday	42 3-16	91½	11 50	3 87½	19 65
Tuesday	42 5-16	92½	11 50	3 90	19 65
Wednesday	42 5-16@42½		11 75	3 97½	19 70

NEW YORK, July 31.—Lake copper after advancing fell back some but closed very strong at $11.75@$12 with consumers buying. Electrotype is not obtainable at less than 10⅝@10¾c. Casting brands, sales of which were made latterly at 10c, are quoted at 10¼c at the close. The London market was firmer yesterday. Cables give merchant bars at £4 15s spot, and £4 15s futures.

Dealings are light in pig lead at $3.90@3.97½. Closing firm. The London market for quicksilver is stiff. New York strong at 70c. Borax is steady; powdered, 8¾@9c; refined, 9@9¼c; concentrated, 7¾@8¼c.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, August 1, 1889.

ANTIMONY	15 @ 16
BORAX—Refined	7½@ 7⅞
Powdered	— @ —
Concentrated	— @ 6¾
COPPER—	
Bolt	21 @ 22
Sheathing	22 @ 24
Ingot, jobbing	15 @ 16
do, wholesale	12 @ 13
Fire Box Sheets	22 @ 24
LEAD—Pig	4½@ 4¾
Bar	5 @ —
Sheet	7 @ —
Pipe	6 @ —
Shot, discount 10% on 500 bags Drop, ₱ bag	1 45 @ —
Buck, ₱ bag	1 65 @ —
Chilled, do	1 85 @ —
STEEL—English, lb	16 @ 20
Canton tool	9½@ —
Black Diamond tool	10 @ 16
Pick and Hammer	8 @ 10
Machinery	4 @ 5
Toe Calk	4½@ —
TINPLATE—B. V., steel grade, 14x20, P. S.	4 60 @ 4 65
B. V., steel grade, 14x20, spot	4 80 @ 4 90
Charcoal, 14x20	6 25 @ 6 75
do roofing, 14x20	5 12½@ 5 25
Pig tin, spot, ₱ lb	21 @ 21½
do, do, prompt shipment	— @ —
QUICKSILVER—By the flask	47 50 @ —
Flasks, new	— @ —
Flasks, old	35 @ —
COKE—Eng., ton, spot, in blk & sks, resptvly	17 00 @19 00
Do, do, to load	13 00 @13 25

IRON—Glengarnock ton	Spot. 27 00 @— —	To Load. 27½@ —
Eglinton, ton	26 00 @— —	26½@ —
American Soft, No. 1, ton	— — @31 00	31½@ —
Oregon Pig, ton	— — @30 00	— @ —
Clay Lane White	— — @24 50	25 @ —
Shotts, No. 1	28 50 @29 00	— @ —
Bar Iron (base price) ₱ lb	2¾@ 3	— @ —
Chrome iron ore, ₱ ton	— — @10 00	— @ —

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$19 00	$16 00
41 to 50 ft	20 00	17 00
51 to 60 ft	22 00	19 00
61 to 70 ft	26 00	22 00
1x3, fencing	21 00	18 00
1x4, "	20 00	17 00
1x3, 1x4 and 1x6, odd lengths	18 00	15 00
Second quality	16 00	14 00
Selected	23 00	21 00
Clear, except for flooring	30 00	27 00
Clear for flooring	1 00	.....
Clear V. G. No. 1 flooring	5 00	.....
Firewood	13 00	9 00
Dressed Pine, flooring, No. 1, 1x6	31 00	28 00
No. 1, 1x4	33 00	29 00
No. 1, 1¼x4, 1¼x6, and odd sizes	36 00	32 00
All sizes, No. 2	26 00	23 00
Stepping, No. 1	43 00	34 00
Stepping, No. 2	33 00	24 00
Ship timber and plank, rough	26 00	17 00
Selected, planed 1 side, av'ge 40 ft	28 00	23 00
" " 2 " " "	30 00	26 00
" " 3 " " "	32 00	27 00
" " 4 " " "	34 00	29 00
Deck plank, rough, average 35 ft	34 00	31 00
Dressed, average 35 feet	39 00	34 50
Pickets, rough, B. M	19 00	15 00
½x1½, 4 ft long, ₱ M	5 50	4 00

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	$6 75 @ 7 00	Cardiff	9 50@10 00
Liverpool St'm	7 50 @ 7 75	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	8 00 @ 8 50	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$9 00	Gilman	6 00
Scotch Splint	9 00	Seattle	6 00
West Hartley	10 00	Coos Bay	5 00
Greta	8 00	Cannel	10 00
Westminster Brymbo	9 00	Egg, hard	17 50
Nanaimo	9 00	Cumberland, in sacks	19 00
Sydney	$8 00	do, bulk	18 00

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

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ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'NT. SALE.	SECRETARY.	PLACE OF BUSINESS
Argenta M Co	Nevada	19	July 20	Aug 21	Sept 16	E M Hall, 314 Montgomery St
Alpha Con M Co	Nevada	3	July 15	Aug 22	Sept 12	C E Elliott, 309 Montgomery St
Andes M Co	Nevada	35	June 25	June 12	July 18	Aug 8	J J Hawkins, 309 Montgomery St
Baltimore M Co	Nevada	5	July 25	July 2	Aug 5	Aug 24	A R Grim, 401 Montgomery St
Baker Divide M Co	California	17	July 25	July 8	Aug 10	Aug 28	D M Kent, 330 Pine St
Cadmus M Co	Nevada		June 20	June 3	July 19	Aug 19	J Craig, 204 California St
Chollar M Co	Nevada	27	July 20	Sept 10	C E Elliott, 309 Montgomery St
Crocker M Co	Arizona	7	July 10	June 14	July 19	Aug 13	A Waterman, 309 Montgomery St
Crown Point M Co	Nevada	51	July 30	July 9	Aug 12	Sept 2	J Newlands, 329 Pine St
East Mt Diablo M Co	California	5	July 10	July 18	Aug 22	Sept 16	R W Heath, 318 Pine St
Eureka Con M Co	Nevada	12	July 30	Jun 12	July 15	Aug 7	H P Bush, 306 Pine St
Frue Con M Co	California	6	July 1½	June 11	July 18	Aug 10	J C Bates, 434 California St
Golden Fleece G'v'l M Co	California	14	July 17	July 20	May 21	July 20	Sept 16	W J Gleason, 806 Market St
Grand Prize M Co	Nevada	21	July 30	July 27	Aug 30	Sept 20	R R Grayson, 327 Pine St
Mexican M Co	Nevada	38	July 25	July 9	Aug 13	Sept 3	C E Elliott, 309 Montgomery St
Mono M Co	California	28	July 30	July 24	Aug 28	Oct 1	B L Burling, 309 Montgomery St
North Belle Isle M Co	Nevada	15	July 30	June 17	Aug 1	Aug 22	J W Pew, 310 Pine St
Original Gold Hill M Co	Nevada	12	July 25	June 17	July 25	Aug 14	A W Barrows, 303 California St
Overman S M Co	Nevada	60	July 25	July 27	Aug 30	Sept 20	G D Edwards, 414 California St
Platt & Gilson G M Co	California	1	July 3	June 20	July 22	Aug 7	C Herrman, 326 Kearny St
Quartz Mountain M Co	California	21	July 40	Jun 17	July 22	Aug 15	E Hestres, 217 Sansome St
Savage M Co	Nevada	73	July 50	July 19	Aug 21	Sept 10	E B Holmes, 309 Montgomery St
Utah Con M Co	Nevada	7	July 25	July 9	Aug 13	Aug 30	A H Fish, 309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING	DATE
Coos New York M Co	California	C E Elliott	309 Montgomery St	Annual	Aug 3
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	Annual	Aug 5
Julia Con M Co	Nevada	J M Buffington	303 California St	Annual	Aug 13
Live Oak Drift Gravel M Co	California	J Morizio	328 Montgomery St	Annual	Aug 20
McMillen M Co	Arizona	J Morizio	328 Montgomery St	Annual	Aug 7
Navajo M Co	Nevada	J W Pew	310 Pine St	Annual	Aug 13
South Feather W & M Co	California	A Halsey	328 Montgomery St	Annual	Aug 12

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Benton Con M Co	California	V B Allen	330 Pine St	Annual	July 31
Caledonia M C	Nevada	A S Cheminant	328 Montgomery St	08	July 5
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	July 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	July 25
Lincoln	California		Grass Valley	7.50	May 5
Navajo M Co	California	J W Pew	310 Pine St	10	Apr 1

Mining Share Market.

Trading the past week was more active, but at declining prices, with quite a shading in prices, averaging fully ten per cent since Monday. The decline was evidently engineered by the pool for the purpose of demoralizing the public and causing them to throw their holdings on the market. Naturally outside holders are afraid of assessments and sell for them, while they buy for dividends. Insiders buy for assessments and sell for dividends. After so great a depression and such low prices, compared with what they were a few months ago, it would seem as if prices ought to be either bottom or very nearly so. The difficulty with outside operators is, they buy more stock than they can care for, and by buying on a margin they seldom make, but lose all, and rightly so. The sinking in the values of the Comstocks took the Quijotoas and Bodies down also, but the Tuscaroras appeared to have had better support, as had Eureka Con. The air is full of bear points—assessments, no ore, and like talk. If persons who are lavish with information know so much they should be rich, instead of poor, as the large proportion are.

From the mines the news is more encouraging, so far as the Comstocks are concerned. The winze being sunk from the 1950-foot level in Con. Virginia, reported to be near the Ophir line, is down some 40 or 50 feet, and is in several feet of very rich ore. The character of this find gives hopes that it will make with depth into a large body of very rich ore. As water will interfere with sinking to any depth below the 2000-foot level, it is not at all unlikely that they will drift south from the Ophir shaft so as to intercept or run into the ore. This winze is from 1200 to 1300 feet from that sunk from the 1950-foot level in Con. Virginia near the Best and Belcher line, and about which the daily papers make so much noise. By those in position to know it is claimed that if work is not suspended they will run into ore in driving west crosscut No. 2 in Union. The nature of the work going on in several of the Gold Hill and middle mines causes experienced mining men to look for happy results before three months pass by. In the Alta group of mines more work is said to be outlined for the near future. From the Quijotoas, Silver King and Eureka Con. no new information is at hand. Several of the leading mining men on the Comstock inspected the Tuscarora mines and report favorably on them. While they apparently vouch for the ore in the mines the public, no doubt, would like vouchers for them, particularly with the stocks of the mines in which they are connected, selling at prices several times less than a few months ago. From the Bodies we have nothing new to report. Captain John Kelly is here, but so far as we can learn is non-committal. As yet our correspondent does not intimate anything worthy of publishing, although he is hopeful of favorable results from the work now going on in the mine, but this has been the outlook so long it is becoming quite stale.

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Mt. Diablo, July 27, $11,275; Blue Bird, 20, $18,000; Butte and Boston, 20, $18,896; Lexington, 20, $28,256; Moulton, 20, $10,928; Lexington, 26, $13,088; Hanauer, 24, $2000; 26, $4140; Queen of the Hills, 28, $1200; Horn Silver, 30, $27,000; Hanauer, 30, $4600; Mt. Diablo, August 1, $5800.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. C. HOAG—San Francisco.
R. G. BAILEY—San Francisco.
W. W. THEOBALDS—Central California.
GEO. WILSON—Sacramento Co.
FRANK S. CHAPIN—Butte and Plumas Cos.
E. H. SCHARFFLE—Calaveras and Tuolumne Cos.
DR. W. F. DRAKE—Sonora, Cal.
A. F. JEWETT—Tulare Co.
ROBERT M. MAPPES—Fresno Co.
E. L. RICHARDS—San Diego Co.
CHAS. R. ROOD—Kern Co.
WM. WILKINSON—San Joaquin Co.
WM. H. COOK—Santa Cruz Co.
JULES BAUMANN—Arizona.
CHAS. F. BLACKBURN—Idaho.

THE San Diego *Union* says the price paid by John D. Spreckels for the Story interest in the Coronado property was $511,000.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 10.		WEEK ENDING July 17.		WEEK ENDING July 24.		WEEK ENDING July 31.	
Alpha	1.00	1.20	.90	1.10	1.00	1.15	.95	1.10
Alta	1.20	1.30	1.20	1.35	1.30	1.45	1.25	1.30
Andes	.40	.40	.35	.65	60	.6.	.60	.65
Argenta	....	....	....	....	....	....	....	....
Belcher	2.65	3.15	2.60	3.00	2.80	2.95	2.35	2.85
Best & Belcher	2.85	3.40	3.10	3.90	3.45	3.80	3.10	3.60
Bullion	.60	.65	.65	.65	.65	....	.60	.65
Baltimore	....	....	....	....	....	....	.05	....
Belle Isle	....	....	.25	.25	.25	....	.25	....
Bodie Con	1.10	1.20	1.05	1.35	1.20	1.40	1 05	1.15
Benton	4.00	....	4.00	....	4.00	....	4 50	....
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.30	.35	.30	.35	.30	....	.30	....
Commonwealth	3.85	4.10	4 10	4.30	3.95	4 30	3.95	4.10
Con. Va. & Cal	7½	7¾	6¾	7½	7	7½	6¾	7½
Challenge	1.75	....	1.90	2.00	1.90	2.10	1.75	2.05
Chollar	1.45	1.60	1.40	1.60	1.45	1.50	1.35	1.50
Confidence	5¾	5¾	5¾	5¾	5¼	6	5.50	....
Con. Imperial	.40	.45	.40	....	.40	.50	.40	.50
Caledonia	.20	....	.20	.25	.20	.25	.20	....
Con. Pacific	....	....	....	....	....	....	....	....
Crown Point	2.00	2.55	2.10	2.30	2 10	2.15	2.00	2.20
Crocker	.25	.30	.25	.40	.35	.40	.35	....
Central	....	....	....	....	....	....	....	....
Dicy	....	....	....	....	....	....	....	....
East B. & B	....	....	....	....	....	....	1.35	....
Eureka Con	....	....	1.00	....	....	....	....	....
Exchequer	.60	.65	.60	.65	.60	.70	.60	.65
Grand Prize	....	.70	.85	.95	.75	.80	.50	....
Gould & Curry	1.80	2.10	1 85	2.20	2.00	2.10	1 80	2.00
Hale & Norcross	2.90	3.10	2.85	3.15	2.90	3.00	2.75	3.00
Holmes	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Iowa	....	....	....	....	....	....	....	....
Julia	.25	.30	.30	....	.30	.35	.30	....
Justice	1.15	1.35	1.35	1.75	1.70	2.15	1.55	1 80
Kentuck	1.00	1.25	1.00	1.00	1.05	1.15	....	....
Lady Wash	....	....	.35	.35	.40	....	.40	....
Locomotive	....	....	....	....	....	....	....	....
Martin White	....	....	....	....	....	....	....	....
Mono	.75	....	.80	1.05	.90	1.00	.60	.70
Mexican	2.75	3 40	2.75	3.10	2.85	3.00	2.50	2.95
Mt. Diablo	....	....	....	....	....	....	....	....
Navajo	....	....	....	....	....	....	....	....
North Belle Isle	1.05	1.25	1.05	1 50	.95	1.15	.95	1.30
Niagara	....	....	....	....	....	....	....	....
Nev. Queen	1.30	1.45	1.60	1 80	1.35	1.50	1.25	1.30
North G. & C	....	....	....	....	....	....	....	....
Occidental	1.50	1.70	1.70	2.40	1.90	2.3	2.00	2.20
Ophir	4.30	5¾	4.35	5.00	4.55	4.85	4.25	4.65
Overman	1.00	1.05	.90	1.00	.95	1.00	.75	.90
Potosi	1.45	1.65	1.45	1.60	1.45	1.60	1.40	1.55
Peerless	.40	....	.35	....	.35	.40	.30	.35
Per	....	....	.15	....	....	....	....	....
P. Sheridan	....	....	....	....	....	....	....	....
Silver Star	....	....	....	....	....	....	....	....
Savage	1.65	1.85	1 60	1.85	1.65	1.80	1.35	1.65
S. B. & M	1.95	2.15	1.70	1.90	1.85	2 00	1.60	1.85
Sierra Nevada	2.15	2.55	2.15	2.45	2.25	2.35	2.00	2.30
Silver Hill	.40	....	.45	.55	.50	.65	.40	.55
Silver King	....	....	....	.85	....	....	.85	....
Scorpion	.20	....	.20	....	....	....	....	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	....	....	....	....
Union Con	2.80	3.25	2.80	3.15	2.85	3.00	2 60	2.95
Utah	.70	.90	.70	.75	.75	....	.65	.75
Yellow Jacket	2.75	3.00	2.80	2.90	2.80	3.00	2.60	2.90
....	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY, Aug. 1, 9:30 A. M

140	Mexican		2.55
200	Nev. Queen		1.30
50	Alta	1.3	45c
200	Andes	60c	1.25
150	Alpha	1.00	50
200	Belcher	2.45	50
50	Bodie	1 00	50
200	Bullion	60c	250
150	Chollar	1.35	200
200	Commonwealth	4.00	80
50	Confidence	5¾	90
500	Crown Point	2.10	50
50	Con. Imperial	45c	100
200	Con Va & Cal	6.75	130
250	Gould & Curry	1.85	300
20	Hale & Nor	2.75	150
350	Justice	1.55	730
	Mexican		2.55
	Nev. Queen		1.30
	Alta		45c
	N. Belle Is		1.25
	N. Commonwealth		1.30
	Occident		2.10
	Ophir		4.20
	Overman		75c
	Peer		15c
	Potosi		1.40
	Savage		1.40
	Sierra Nevada		2.10
	Silver King		80c
	Utah		65c
	Yellow Jacket		2.65

RANCHERS and fruit-growers at Tulare are preparing a petition to Congress asking that the timber-claim system be abolished in this State, as the cutting of t mber in the mountains has decreased the water-supply. Tulare lake is drying up very rapidly.

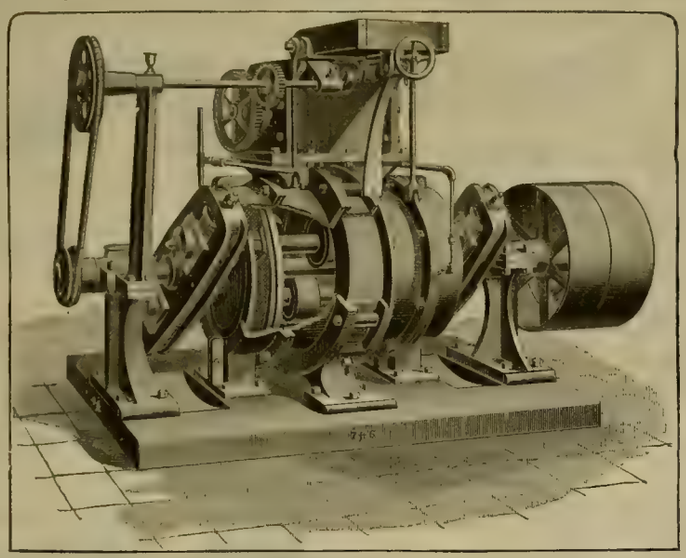
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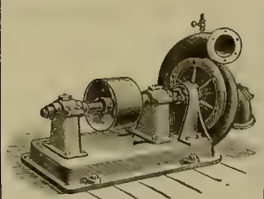
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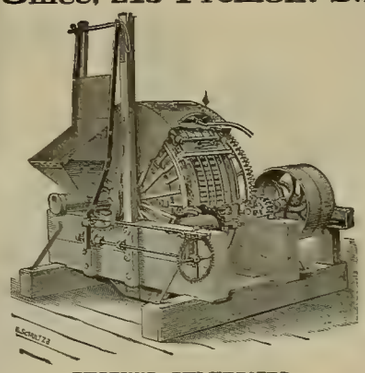
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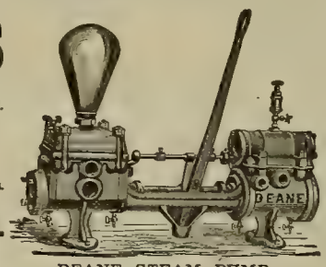
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COAL MINES OF THE WESTERN COAST.
A few copies of this work, the only one ever published treating of Pacific Coast Coal Mining, have been obtained, and are for sale at this office for $2.50 per copy. It was written by W. A. Goodyear, Mining and Civil Engineer, formerly of the California State Geological Survey.

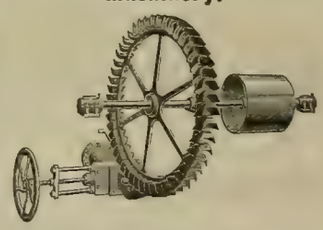
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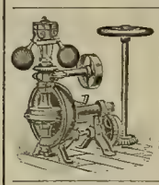

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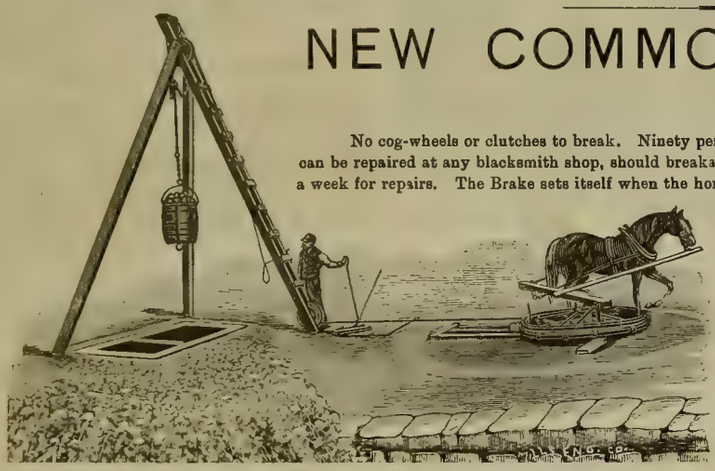
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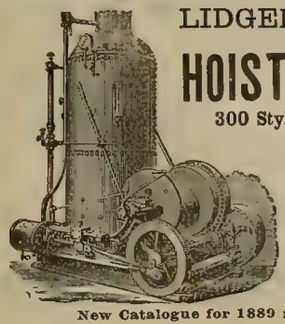
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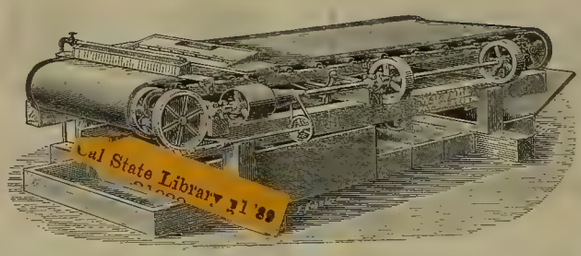
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There are Over 2200 Plain Belt Machines now in Use.

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DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., Room 15, No. 132 Market Street, San Francisco, Cal.

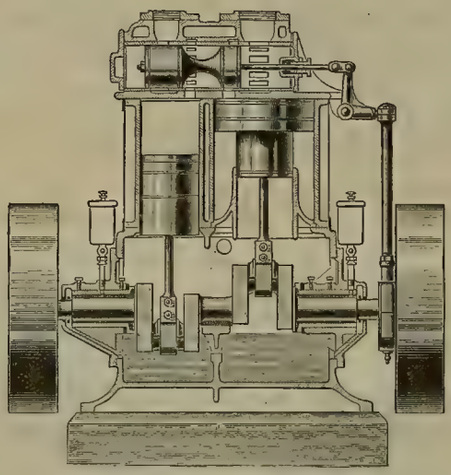
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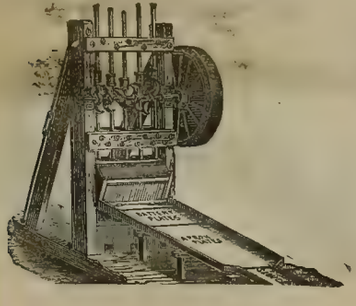
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Is beyond all question the most important improvement that has ever been made in this class of mining machinery. It will do more than twice the work with a given amount of wear than any other Crusher made, besides crushing so much finer that for mining uses, the capacity of the mill is greatly increased. It has the same relative superiority for macadamizing purposes, affording the cheapest and most reliable machine for this use.

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TWENTY-PAGE EDITION.

VOL. LIX Number 6.
DEWEY & CO., PUBLISHERS.

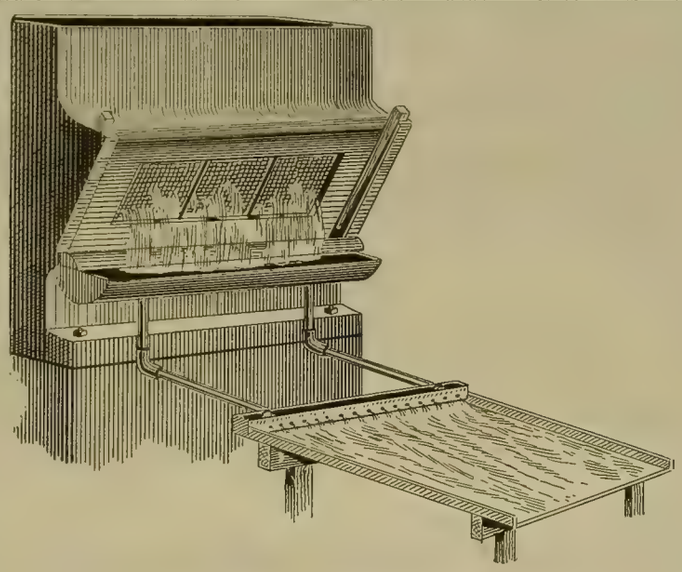
SAN FRANCISCO, SATURDAY, AUGUST 10, 1889.

Three Dollars per Annum
Single Copies, 10 Cts.

Connecting the Apron and Battery.

Mr. Tregidgo, superintendent of the Blue Bell mine, on the South Yuba river, three miles from the village of Ormonde, has invented an improvement in quartz-mills which is designed to facilitate the operation of changing and repairing screens, renewing shoes and dies, cleaning out the mortar, and such other work as requires free access to the front of the battery, usually obstructed by the apron. It is shown in the accompanying cut, which is taken from the report of the State Mineralogist:

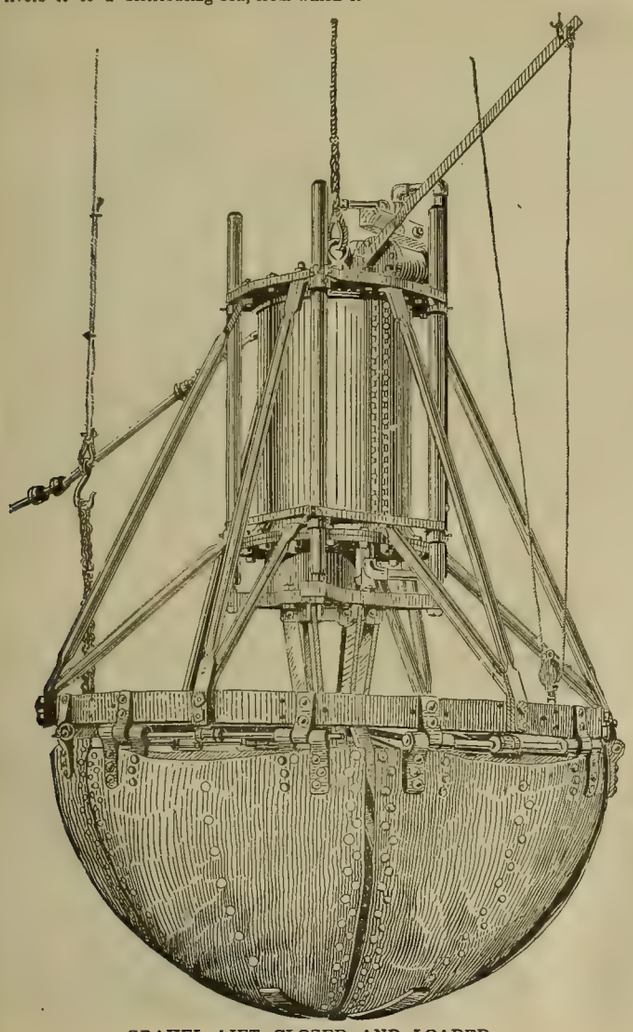
The device consists of a semi-cylindrical iron trough, the length equal to the width of the mortar, and having a breadth of one foot and a depth of six inches. This trough is fixed under the lip of the mortar, in the place usually occupied by the apron; in the bottom of the trough are two openings two inches in diameter, in which are fixed two pieces of two-inch iron pipe, each about 18 inches long, extending vertically downward. The lower ends of these pipes are connected by elbows with horizontal pipes of equal diameter and about three feet long. The trough receives the pulp from the mortar, the pipe into which the pulp flows delivers it to a distributing-box, from which it passes through holes bored in the front on to the apron. By this contrivance the apron is removed some distance from the battery, in front of which the workman can pass without having to climb over the apron or sluice. When it becomes necessary to clean the mortar, the upper ends of the pipes are plugged, the trough forming a convenient receptacle for the rock, sand, etc., taken from the mortar. The sides of this trough are lined with curved plates of silvered and amalgamated copper, not fixed close to the side of the trough, but with a space of about three-quarters of an inch left between.



APRON ARRANGED FOR FREE ACCESS TO BATTERY.

The pulp from the mortar swashes from side to side in the trough in front of the copper plates, and a considerable portion of the gold is retained on the plates, which are secured to the trough by bolts with rubber washers placed between them, thereby preventing their contact. Mr. Tregidgo also uses a lip plate on the mortar outside of the screen. The inside back plates are five inches long by 12 inches wide; the front plates are attached to chuck-blocks as usual, the foot rail of the screen frame being about five inches high, in order to afford the necessary space. The faces of the "chuck-blocks," and consequently of the plates, are rounded in-

(*Continued on page 113.*)



GRAVEL LIFT CLOSED AND LOADED.



GRAVEL LIFT OPEN TO TAKE LOAD. (See page 113.)

Mining-Law Changes.

The Stewart Bill.

The following bill to amend Chapter Six of Title Thirty-two of the Revised Statutes relating to mineral lands and mining resources will be introduced by Senator Stewart of Nevada at the next session of Congress:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section twenty-three hundred and nineteen of the Revised Statutes be amended by adding thereto the following: "But no person shall acquire by location more than fifteen hundred feet in length on the same vein, nor shall any person relocate a claim which he has previously located."

SEC. 2. That section twenty-three hundred and twenty-four of the Revised Statutes be amended so as to read:

"SEC. 2324. The miners of each mining district may make regulations, not in conflict with the laws of the United States, or with the laws of the State or Territory in which the district is situated, governing the location, manner of recording, amount of work necessary to hold possession of a mining claim, subject to the following requirements: The location must be distinctly marked on the ground by posts or monuments so that its boundaries can be readily traced. All records of mining claims hereafter made shall contain the name or names of the locators, the date of the location, and such a description of the claim or claims located as will identify the claim. On each claim located after the tenth day of May, eighteen hundred and seventy-two, and until payment of the purchase money and a certificate of entry has been issued therefor, not less than one hundred dollars' worth of labor shall be performed or improvements made during each year. On all claims located prior to the tenth day of May, eighteen hundred and seventy-two, ten dollars' worth of labor shall be performed or improvements made during each year for each one hundred feet in length along the vein until payment of the purchase money and a certificate of entry has been issued therefor; and for each twenty acres of placer claims, and for each subdivision thereof less than twenty acres, twenty-five dollars' worth of labor shall be performed or improvements made during each year until payment of the purchase money and a certificate of entry shall be issued therefor. But where several adjoining claims, not exceeding five, whether the same be lode or placer claims, are owned or held by the same person, association, or corporation, and the sum of five thousand dollars or more is expended in any one year in good faith for the development of all the claims so owned or held, not exceeding five, there shall be no requirement for separate labor or improvements to be performed or made on the several claims so owned or held during such year. The year within which the annual labor or improvements required to be performed or made by this section shall commence at 12 o'clock meridian, on the first day of October of each year: *Provided*, That upon claims located previous to the first day of March, in any year, the annual labor or improvements shall be performed or made on such claim for that year, prior to twelve o'clock meridian of the first day of October next succeeding; and upon claims located after the last day of February, and prior to twelve o'clock meridian of the first day of October in any year, the annual labor or improvements required shall be performed or made prior to twelve o'clock meridian of the first day of the next following October: *And provided further*, That only one-half of the annual labor or improvements required by this Act shall be necessary to be performed or made prior to twelve o'clock meridian of the first day of October, in the year eighteen hundred and eighty-nine, on claims upon which the annual labor or improvements were performed or made in the year eighteen hundred and eighty-eight; but after the first day of October, in the year eighteen hundred and eighty-nine, the full amount of labor or improvements required by this Act shall be performed or made upon such claims as in all other cases during each year, prior to twelve o'clock meridian of the first day of October. In case the first day of October falls on Sunday or any holiday, the following secular day shall be construed as the first day of October within the meaning of this Act. When the labor required by this Act shall have been performed, or the improvements made, an affidavit shall be filed within 30 days after the time limited for performing such labor, or making such improvements, with the recorder of the mining district in which such claims are situated, and if there be none, then with the recorder of deeds of the county in which the claim or mine is situated, particularly describing the labor performed and improvements made, and the value thereof, which affidavit shall be prima facie evidence of the facts therein stated. And upon a failure to comply with these conditions, the claim or mine upon which such failure occurred shall be open to relocation in the same manner as if no location of the same had ever been made: *Provided*, That the original locators, their heirs, assigns, or legal representatives, do not resume work upon the claim after such failure and before such location, and continue the same with reasonable diligence until the required amount of labor shall have been performed or improvements made. Upon the failure of any one of several co-owners to contribute his proportion of the expenditures required hereby, the co-owners who have performed the labor or made the improvement may, at the expiration of the year, give such delinquent co-owner personal notice in writing or notice by publication in the newspaper published nearest the claim, for at least once a week for ninety days; and if at the expiration of ninety days after such notice in writing or by publication such delinquent shall fail or refuse to contribute his proportion of the expenditure required by this section, his interest in the claim shall become the property of his co-owners who have made the required expenditures, upon recording a copy of such notice, together with an affidavit showing personal service or publication, as the case may be, of such notice with the recorder of the mining district in which such mining claim is situated, and if there be no such officer, then with the recorder of deeds of the county in which such mining claim is situated. When any person or company has developed and exposed a lode, and expended one hundred dollars' worth of labor thereon, said person or company may run a tunnel for the purpose of developing such lode owned by said person or company, and the money so expended in said tunnel shall be considered as expended on said lode, and such person or company shall not thereafter be required to perform labor or make improvements on the surface of said lode in order to hold the same, so long as work is continued on such tunnel."

SEC. 3. That section twenty-three hundred and twenty-five of the Revised Statutes be amended so as to read:

"SEC. 2325. A patent for any land claimed and located for valuable deposits may be obtained in the following manner: Any person, association or corporation authorized to locate a claim under this chapter, having claimed and located a piece of land for such purposes, who has, or have, complied with the terms of this chapter, may file in the proper land-office an application for a patent, under oath, showing such compliance, together with a plat and field-notes of the claim or claims in common, made by or under the direction of the United States surveyor-general, showing accurately the boundaries of the claim or claims, which shall be distinctly marked by monuments on the ground, and shall post a copy of such plat, together with a notice of such application for a patent, in a conspicuous place on the land embraced in such plat previous to the filing of the application for a patent, and shall file an affidavit that such plat and notice have been duly posted, and shall also file a copy of the notice in such land-office, and shall thereupon be entitled to a patent for the land, in the manner following: The register of the land-office, upon the filing of such application, plat, field-notes, notices and affidavits, shall publish a notice that such application has been made, for the period of sixty days, in a newspaper to be by him designated as published nearest to such claim; and he shall also post such notice in his office for the same period. The claimant at the time of filing this application, or at any time thereafter within the sixty days of publication, shall file with the register a certificate of the United States surveyor-general that five hundred dollars' worth of labor has been expended or improvements made upon the claim by himself or grantors; that the plat is correct, with such further description by such reference to natural objects or permanent monuments as shall identify the claim, and furnish an accurate description, to be incorporated in the patent. At the expiration of the sixty days of publication the claimant shall file his affidavit, showing that the plat and notice have been posted in a conspicuous place on the claim during such period of publication. If no adverse claim shall have been filed with the register and receiver of the proper land office at the expiration of the sixty days of publication, it shall be assumed that the applicant is entitled to a patent, and that no adverse claim exists, and upon the payment to the proper officer of five dollars per acre he shall receive a certificate of entry; and thereafter no objection from third parties to the issuance of a patent shall be heard except it be shown that the applicant has failed to comply with the terms of this chapter. But no more than three thousand feet in length along the vein of claims located prior to the tenth day of May, eighteen hundred and seventy-two, and not more than the extent of one claim fifteen hundred feet in length by six hundred feet in width located after said date shall be included in the same application for a patent, and not more than eighty acres of placer ground shall be included in the same application for a patent."

SEC. 4. That section twenty-three hundred and thirty-four of the Revised Statutes be amended by adding thereto the following:

"And the surveyors appointed under the provisions of this section shall have power to administer oaths to their assistants."

SEC. 5. That section twenty-three hundred and thirty-five of the Revised Statutes be amended so as to read:

"SEC. 2335. All affidavits required to be made under this chapter may be verified before any officer authorized to administer oaths in any State or Territory of the United States or in the District of Columbia, and all testimony and proofs may be taken before any such officer, and when duly certified by the officer taking the same, shall have the same force and effect as if taken before the register and receiver of the land office. In cases of contest as to the mineral or agricultural character of land, the testimony and proofs may be taken, under such regulations as the Commissioner of the General Land Office may prescribe: *Provided*, That the presence of rock in place bearing gold, silver, cinnabar, or other valuable metal, shall be regarded as prima facie evidence that the land containing the same is mineral in character; and veins of rock in place bearing such minerals and appearing on the surface of the ground, or in excavations made thereon, shall be regarded within the meaning of section twenty-three hundred and thirty-three of the Revised Statutes as veins or lodes known to exist."

SEC. 6. Amend section twenty-three hundred and thirty-eight of the Revised Statutes so as to read:

"SEC. 2338. As a condition of sale each patent shall reserve the right of way through or over any mining claim for roads, ditches, canals, cuts, tunnels and other easements, for the purpose of working other mines. *Provided*, That any damages occasioned thereby shall be assessed and paid in the manner provided by the laws of the State or Territory in which such mine is situated for assessments and payments for land taken for public use under the right of eminent domain. And the rights and easements heretofore reserved under the provisions of this section (twenty-three hundred and thirty-eight of the Revised Statutes) in patents heretofore issued shall be regulated and made available as herein prescribed."

Meadow Lake.

In an interview with John Clarke of this place our reporter has been able to glean a number of very interesting items concerning Meadow Lake district, the place that is the rebellious ore district.

Work at Meadow Lake has been almost entirely abandoned for a number of years until lately. Our informant says that the excitement there now is caused by the finding of a process by which the gold can be saved—the Morris process. He says that this is a thorough success in his opinion, as 97 per cent has been saved by a good test. On hearing of the process, capitalists from all over have sent experts to Meadow Lake, and prospectors are crowding in thick and fast. John Mackay has had two experts examining claims there from Nevada State for the past three weeks. Some Utah parties are also there.

Meadow Lake mineral belt is about nine miles square. From one end to the other it is nothing but a solid mass of quartz ledges. About 20 years ago Meadow Lake was a town of 12,000 inhabitants, when mills and chlorination works, etc., were built on many claims. The ore was found to be rebellious, and consequently the town was deserted and the constructions were left behind to rot or be destroyed, as might be the case.

Messrs. John Clarke, Frank Cook and Victor Blodgett have located, and are at present working the tailings of the Grub Stake, formerly known as the California ledge, and the Oro Fino ledge. The tailings, which were worked years ago by arastras and only 20 per cent of the gold saved, are now being worked by the above gentlemen with a small and simple apparatus invented by Clarke, and about 85 per cent is saved. By working these tailings they have realized considerable over wages, besides being able to do their assessment work on their claims at the same time.

The average width of the Grub Stake and Oro Fino ledges ranges from eight to forty feet and they are well-defined ledges with good walls. It is the intention of Messrs. Clarke, Cook and Blodgett to put a mill on their claims this fall if possible and use Morris' canvas process. The mill which they intend to erect has four stamps and was put up a short distance from where they want it now at the time of the boom.

If the Morris process for saving the gold proves as good on a large scale as it has on a small scale, the famous Meadow Lake district will again boom, this time permanently.—*Sierra Tribune*.

THE PHILADELPHIA SMELTING PLANT at Pueblo, Col., Edward R. Holden, manager, will soon be the largest in the world. They are now treating 350 tons daily. By July 15th four additional roasting furnaces will be in operation, and by Aug. 15th four more blasting furnaces will be in working order, making the total capacity of the plant not less than 500 tons daily. Mr. Holden recently secured a contract to treat, per month, 3000 tons of ore from the Sierra Mojada mine in Old Mexico, thereby placing his Pueblo smelter in direct competition with the smelters of the Missouri valley, which have heretofore been treating Old Mexico lead ores coming into this country free of duty. If duty is at any time put on lead it will cut this supply off. But Mr. Holden is inclined to think that such will not be done. He says that there are more dry ores in Colorado than there are lead ores, and while it would be to the interest of the miners to shut out the product of Old Mexico, it would materially increase the treatment of dry ores.

IF there were but one grindstone in the world and no sandstone for making any more, the one existing grindstone would be of immense value, and would probably be secured by some flashy millionaire to wear as a shirt-stud.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Tuolumne Mines.

Claims in Rawhide District.

EDITORS PRESS:—With your permission I will give in this communication a short report on some of the mines in the Rawhide district, the nearest postoffice to which is Jamestown. This group extends from Table mountain northwest to Mormon creek. The first mine north of the mountain is Rawhide No. 2. It has been opened by a small shaft, which exposed a very large vein of fully eight feet in width and no walls yet in sight. At the time of my visit I could see free gold in the quartz, generally surrounded by azurite, with fine specks of tellurium. Certainly the rock contained sufficient free gold to pay. No doubt in the future, when developments are made, a profitable mine will be found, for the indications are very favorable.

The adjacent mine north on the same lode is the Rawhide No. 1 (patented) recently purchased by Nevills & Co. They have secured a most valuable property, for in the early days a very large amount of gold was taken out from the upper levels, near to the surface. Two shafts have been sunk upon this mine with steam machinery, etc., but the mine is now under water. There is a mill of 20 stamps which is what might be termed an old silver mill, with a series of Hepburn pans, not in any way suited to treat the class of ore here found. This ore is heavily charged in the lower levels with tellurides in the forms of native tellurium, calaverite, combining with gold and silver, as well as petzite, specimens of which I have had in my possession of great richness, assaying into the thousands. These ores of course require special treatment after having been concentrated. At the time the mine was running, the pulp was treated in the pans. The bases sickened the quicksilver (antimony being also present). The majority of the free gold was lost and washed down the creek, hence through ignorance and wastefulness, a rich and valuable mine was closed down. Of course the rich bases suffered the same ill fate and were lost, the company having no concentrators to save them. I trust to be able to report in the future of the prosperity of this, another of Tuolumne's rich mines.

Next to this mine, north, is the Rappahannock. A shaft has been sunk and I have seen some fair specimens of golden quartz taken out, but the shaft was sunk on the talcose slate to the east of the main vein; hence the richness or otherwise of this property is undetermined. It is rational to assume, however, that if opened up on the right line the same rich ore would be traced as in its neighbor, the Rawhide No. 1, for on the surface rich free placer gold was found that must have been left by time and erosion of the quartz seams and golden threads that interlace and cover the surface in this mine. It is owned by Richard Chute of San Francisco.

The next mine north is the Isabella, a patented claim owned by Mr. Jno. Faxon of Sonora. This mine is opened by several small shafts (not deeper than 20 feet), cuts and tunnels. Everywhere that the lode was tapped pay-rock was found. The rock carries the same bases as the Rawhide No. 1, but in a lesser degree, depth not having been attained to prove its richness. There is sufficient development made, however, to warrant a systematical opening up of the mine as well as giving it the value asked by its owner. Besides, I will here mention that there is an unseen value in this mine to the casual observer, which is its key to the successful working of the Rawhide and all the other mines south. From its topographical position it commands the outlet to Mormon gulch, at which point a main tunnel could be entered to drain all the mines in its course to a depth of several hundred vertical feet. A vast amount of water would be set free, which alone would be most valuable for irrigating and other uses. The water stored under Rawhide Flat is immense.

Again, to the north we find the Alameda mine, with which I am most conversant, having myself been connected with it during the tenure of former owners, now deceased, and can speak authoritatively.

I inclose a "plat" of the Alameda mine and vein, as it passes into the Isabella to the south and the Tarantula to the north. This mine is 1500x600, and is opened almost its entire length by shafts, cuts and tunnels, and is the same vein as Rawhide, being the bowlder vein of the mother lode or main vein. The Alameda enjoys equal topographical conditions that the Isabella does, having its base to Mormon Gulch, or nearly so, and a main tunnel entered jointly by all the mines in this group could be so entered as to pass through the Alameda first, thence to the Isabella and southward through the other mines, making one grand drainage system. If the expense was jointly divided this would result in a great and grand undertaking of mutual advantage—a prospective work I much desire to see consummated. The vein is large, will average, probably, 12 feet. In many places I know 20 feet or more of vein matter will be found. I have had rock from this mine worked that has paid, in mill and arastra, from $22 to $80 per ton in free gold. These are facts. There are plenty

of bases that are refractory in this mine and along the line of the group, but they can all be treated by special system, being of exceedingly high grade that will leave a magnificent margin of profit.

I find the bases in the Alameda are similar to those in the Rawhide, viz., azurite, nickel, galena, antimony, native tellurium (rich in gold), calaverite, and petzite (also very rich). I have also found an arseniate of cobalt. Truly this is a grand mine for the student of mineralogy. I know of no instance in Tuolumne county where the bases are so diversified as in this Alameda mine. Then again there are some exceptional diversifications in geological lore in this mine that are only found in rich gold-bearing formations, but to enter into the subject here would take up too much space. But they exist, which is conclusive to my mind, after nearly 35 to 40 years' study and practical mining knowledge, to be, when found, always a necessary desideratum to a successful paying property. I have traced the pay rock continuously on the Alameda for 1000 feet and have made numerous scorifications, assays, etc., with most pleasing results. As Messrs. Hayward & Hobart are doing some prospecting on the property at the present moment, I trust to their becoming the future owners, for in their hands success financially is assured, not only to themselves, but to this county. The richest rock I found was on the footwall, a stratum that is exceedingly rich in free gold. I have made careful mining surveys of the old works but will not trouble you with a section. My desire is to see Tuolumne figure as a great gold-producer, which it should be, and can be, if we get capital to unearth her mineral resources and the right class of men to operate, who possess sufficient scientific knowledge in the treatment of the ores. It is an easy matter to find plenty of good miners to extract the crude material from its resting-place, because that is simply mechanical; but to save the gold and extract it from its metallic embrace is a matter of science alone. It is a happy thing for this age of advancement and knowledge that such can be accomplished, freed from any foolish chimerical nonsense, by the result of chemical and scientific knowledge alone. The days of free-gold working by the old clumsy stamps and mortar plays a very insignificant part in the reduction of our gold rocks to-day. Pulverizing the quartz can be done in many ways, but gold saving at a profit from rebellious and refractory ores is a matter for the metallurgist to solve in a plain, simple and inexpensive method, whereby a good marginal profit is attained and everything, or metal of value, saved in the one process.

Next in order to the Alameda northwest is the Tarantula. The rock is very similar to that in the Alameda, being of course on the same vein, but frequently cross courses cut into lodes and change their character either for the better or worse, throwing into the parent vein a different metal or decreasing or increasing the gold pay. Nearly all along the line of this group quite large veins enter and come into contact with the main vein, coming through the footwall. I have found where the wall rock at the point of contact is genial—say, for instance, a dyke of intrusive or eruptive rock, being on the wall, or entering with the cross vein, will be productive every time of good results. I find in the Alameda more of this class of intrusive rock on the footwall, and coming into it, than any other mine in the group; but perhaps it is because this Alameda has been more extensively opened than any other of its neighbors—not in depth, but laterally and horizontally—giving one a chance to better examine the wall rocks.

The Tarantula is opened by a 90-foot shaft. The rock has milled from $6 to $40 per ton. It is owned by Mr. Frisbee of Sonora and is patented. Next to the Tarantula is the "O. K." mine, also the property of Mr. R. Chute, but it is to the east of the main vein and not on the same line as the group south, but rich quartz has been found in some of the strata. This is the most northerly mine of the group.

ARGUS.

ELECTRIC MOTORS are now applied on warships for hoisting ammunition, instead of using the "pony" steam engine. The new method insures more of convenience, cleanliness, economy of space and coolness of atmosphere. Is there any time and place where electricity may not efficiently supersede steam in performing ordinary labor?

The Idaho Gold Region.

EDITORS PRESS:—This Salmon river section, the famous gold portion of Idaho, is troubled with a scarcity of water this season. The placer mining is about ended for the summer except on the larger streams. The quartz mines are being worked and with very good results. The Kentuck and Grunter and Clipper-Bullion mines near Shoup are producing well this year. Other gold veins are being opened near Leesburg, Gibbonsville on Pine creek; and about 10 miles down the river below Salmon City some fine free-gold ledges are being worked. All these quartz ledges are of an exceedingly promising character and no doubt a number of rich gold mines will soon be opened up in this vicinity.

This gold field is 50 to 100 miles from the railroad, but there is a good wagon-road to the river and machinery can be gotten in cheaply to the mines below by floating it down on flat-boats. It is 200 miles down the river from Salmon City to the old Florence and Warrens diggings, and this entire mountain section is known to be good as a gold quartz country. Some very large veins outcrop, showing good pay ore to begin with, and the facilities for working them are first-class; there is plenty of wood and an abundance of water.

No doubt, a few years hence there will be a number of mills along the river (Salmon) crushing gold out of these rocks. The gold veins found in this section are mostly of free-milling ore, going from one-half to five and ten ounces of gold per ton, and it can be mined and milled very cheaply.

In the Continental divide, directly east of Salmon City, there is a mineral belt 40 miles in length that is known to be rich in gold, silver, copper and lead. Col Shoup (our present Territorial Governor) is the owner of some valuable gold and silver mines in this section.

Eventually this great gold-field will become the most productive region in the West; that is, as a gold quartz country.

Enterprising men, with means, could make a large sum of money by coming and taking hold of these properties. CHAS. F. BLACKBURN.

Salmon City, Idaho.

A Nevada Iron Deposit.

EDITORS PRESS:—Knowing that your paper is on the lookout for the interests of the miners, I wish to inform you that an immense deposit of iron ore (that carries at least 80 per cent), some 3000 feet long by 300 wide, has been discovered in Humboldt Co., Nev., by P. K. Reid. Now that the Government lets contracts for building iron vessels in San Francisco, this is a good chance for some enterprising company, as this body is so immense. It lies about 18 or 20 miles from the railroad, but even with this difficulty it can be put f. o. b. at Lovelocks, Nev., on C. P. R. cars at about a cost of probably $6 per ton. The owner, Mr. P. K. Reid, will either sell by the ton or will sell out his interest for a reasonable price. He courts correspondence on this subject; that is, if party is doing so with intention of buying. Should you know of any parties whom this would interest I wish you would let them know that it is the richest and largest deposit of iron on this coast, as it is very near as solid as the solid metal itself. P. K. REID.

Lovelocks, Nev.

Manufacture of Mica.

The Lubricant by a New Process.

Mica is a mineral that abounds in large quantities in Colorado, says the Denver *Tribune*, and is one, when properly handled, that can be put to a variety of uses. Owing to the want of proper machinery to handle it, it has been impossible heretofore to utilize it for purposes to which it is especially adapted. The principal use to which it is put at the present time is for stove doors, wall paper and some kinds of rough bronzing.

Recently a company was formed for the purpose of manufacturing a mica lubricant. The peculiarity of mica as a lubricant lies in the fact that it is absolutely anti-friction, and it is claimed that with it hot boxes or journals are simply impossible.

This new company is incorporated under the name of the Railroad Mica Lubricating Company, with a capital stock of $200,000. The officers of the company are: Senator Charles H. Abbot, president; S. W. Kimble, vice-president and general manager, and S. McClanathan, secretary and treasurer.

Yesterday a reporter of the *Republican* visited the works, which are now in operation, and was shown through by Manager Kimble, who kindly explained the various workings. The mica comes to the factory in carloads, just as it is taken from the mine.

It is fed by boys into two machines, which cut it into small fragments about half an inch in size. By a system of pneumatic tubes the mica, so cut, is delivered to the atomizing machines, which grind it into powder. These machines one must see to fully realize their peculiar action and construction. Each machine consists of two steel shafts three feet long, with a series of gun-metal spirally arranged beaters, which revolve in a closed case forming a figure "∞" When in operation these machines make from 5000 to 7000 revolutions a minute. The beaters on the revolving shafts are so arranged that the fingers on one pass between the fingers on the other shaft, so that when the material is passed through the pneumatic tubes from the feeding machine to the atomizers at a velocity of 15 000 feet a minute, the work of atomizing is instantaneous. The mica, now reduced to atoms, continues its course at the same velocity through another set of pneumatic tubes to the settling-bins. Here the current is so retarded by the peculiar mechanism that it causes the material to settle in the various compartments, of which there are six, at the same time grading the material according to its fineness. The powdered mica is now settled in the hoppers or bins, immediately over the mixing-pans. Here the several grades are drawn into the pans, which are provided with mechanical mixers, and the lubricant is made up by the use of the proper percentage of oils, mica and such other ingredients as the company uses in the manufacture of the product. Directly over the hoppers are located the oil-tanks which supply the mixers by a pipe running down on the outside of the hopper, on the end of which is a faucet.

At the south end of the bins there is located a large cylindrical machine four feet in diameter and ten feet high, that is called a dust-arrester. Any of the material that is so light and fine that will not settle is driven into this machine by air currents which thoroughly separate the mica dust from the air, where it settles in the bottom of the machine and is drawn off as needed.

All the machinery used in the factory and the system of handling the material is the invention of Mr. S. W. Kimble, the manager of the works, and is covered by patents belonging to the company.

It is stated that the capacity of all machinery heretofore made for pulverizing mica has been from 300 to 400 pounds a day, and then the material has not been sufficiently fine for lubricating purposes. It is claimed for this new concern that it can pulverize about five tons a day, or in ten hours' running. The new factory will begin active operations to-day. A number of experimental runs have been made, and in every case the result has been satisfactory. A carload of mica was received yesterday and five more cars are en route to Denver.

It is the intention of this company to make a special lubricant for dynamos and other high-speed machinery—shaftings, journals, etc., in addition to the ordinary lubricants for railroads, cable lines and machinery of that character.

If the manufacture of mica lubricants proves to be a success, and there is no apparent reason why it should not, it will be a big thing for Denver and Colorado, and this modest factory will become one of the largest concerns in the country. The necessary ingredients, mica and oil, are plentiful in Colorado. It is stated that up to the present time the railroads of the country have never succeeded in getting a lubricant that would do away with hot boxes and journals. If this new lubricant will do that, and that is what its reputation is based upon, it will take several factories to supply the demand from the railroads alone.

Altitudes.

Astronomers have long been aware that the perturbations in the lower strata of the earth's atmosphere greatly hindered their getting clear views of the heavenly bodies. Consequently they have begun to favor the building of observatories at high elevations. The Lick Observatory has been built at great expense upon a mountain 4000 feet above the level of the sea. Here has been mounted the largest object glass in the world, and grouped around it a corps of able and experienced astronomers. The scientific world eagerly waits the revelations they are almost sure to make known. Here they are at work day and night in a clear, almost cloudless sky, while fog, clouds and smoke may envelop the valley. Only the other day a comet was discovered there so pale, tenuous and evanescent that it has not yet been seen by the astronomers in the more vaporous sky of the East.

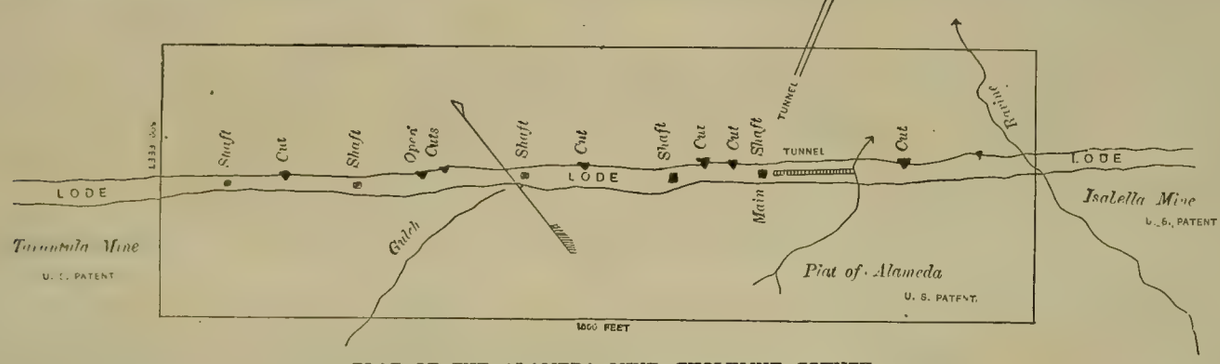
Then the mountains of our country and Europe are every summer populous with the seekers after pure air and water and rare scenery. Tourists will visit Mt. Shasta or Mt. Washington to feast their eyes upon the extended, varied and wonderful landscapes spread before them from these altitudes. They will, in Europe, leave their beds at 3 o'clock in the morning to climb Mt. Rigi, in order to see the sun pour its radiance over the mighty waves of the Alps, illuminating a vast extent of country. Hotels and resting-places are built on these great elevations, and the time and money spent on these trips are never regretted.

Even our geographers begin to feel the need of going into the air. Instead of being content to triangulate the surface of the earth, they are getting into balloons and giving us maps and photographic views taken near the edge of cloudland.

Now our theosophical friends have a wonderful knack of seeing a spiritual meaning in material things. A snake with its tail in its mouth is a picture of eternity, and gophers and jack-rabbits are permitted to go scot free as representatives of the infinite life. But passing this all by, there is a moral lesson to be learned in high elevations. We have only wide views of history, society and the course of human events as we stand on great altitudes. In no other way can our horizon be enlarged.

In no other way can we see the comparative magnitudes and true relations of things. This is as true morally and intellectually as in the physical world. We are prone to look around us and into the spiritual heavens through a murky and unquiet atmosphere. The mists of ignorance envelop us and the miasms of doubt and prejudice are thick around us. The swift currents of passion, the various and fluctuating winds of time and place, sect and party so greatly perturb the air that we get a mere glimpse of the spiritual universe. Our astronomy is a peep over the chimney-tops and our geography the width of a railroad track. The fact is, we see this mighty drama of Divine Thought passing through time, with stars and planets for stage-lights, according to the color of the glasses which we wear. Surely there must be some hilltop or mountain range not far away where we can rise above the arid and commonplace, some lofty peak where we may find a clear vision and a surcease from doubt and despair.

The artist finds a temporary and blissful oblivion in his ideals; the philosopher finds a sort of nepenthe in his theories, and the litterateur finds an escape from the frets and worries of the present on the forest hights, where genius has lived and toiled. The lover of music is often so borne along on the tides of song and harmony as to forget to eat. The Christian mounts on the wings of faith into such a clear air that he can read his "title clear to mansions in the skies." Indeed there are hundreds of roads to the mountains. Elevations are accessible to all of us; we may carry little observatories in our hearts, and while busy with our daily drudgeries, take an occasional peep at the stars. We may daily and hourly live on the mountain-tops of some great hope, love, faith, useful occupation, charitable deeds and grand theory of the universe. But, after all, let us remember that while Jesus was transfigured on the Mount, it was in the wilderness He met and vanquished the tempter.



PLAT OF THE ALAMEDA MINE, TUOLUMNE COUNTY.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Alameda.

STRUCK A LEDGE OF CHROME.—Livermore *Herald*, July 29: The workmen at the Douglas chrome mine on Cedar Mountain struck a fine ledge of chrome, just south of the old workings, last week. They will begin taking out ore at once and thus investigate the extent of the find. This is an entirely new ledge, the existence of which, however, was suspected a year or more ago. Some prospecting was done, a few feet too far to one side. There is also an exposed ledge in the old workings.

Amador.

ALPI.—*Ledger*, Aug. 3: At a meeting of the directors of the Alpi Development & Mining Co. held last Saturday, it was resolved to suspend all operations for the present. After extending the tunnel 60 feet further into the hill, it was found that the ore body at this point had pinched to about four or five inches in thickness. A crosscut was run 15 feet, but failed to reveal the presence of any more quartz. This fact, however, had no discouraging effect. The ledge is long enough and wide enough for all practical purposes. It was thought desirable to take out about 200 tons of ore and have the same hauled to the Moore or some other mill near by for a test crushing, so as to determine as near as possible by actual mill process whether the rock carries gold in sufficient quantities to pay. This plan could not be carried into effect, owing to the slacking up of the water supply. Under the circumstances it was concluded to bring everything to a close, and practically wind up the company's affairs.

NEW LONDON.—Everything is bustling around this mine. Fourteen men were put to work grading for the mill early this week. The steam boilers and other machinery have arrived on the ground. The lumber for the mill will be obtained from Tarr's mill, and some of it is already on the ground. Everything will be pushed right along from this time on, and it is expected the 40 stamps will be in motion in November. The mill is to be first-class in every respect.

MISCELLANEOUS.—The Dyer cannon-ball quartz-mill, erected on the Grainger mine at Pine Grove, has been running two weeks and has been doing good work. It runs by steam. The shortness of water has been a source of trouble. They have about ten tons more to finish the crushing. The Oneida mill has been idle since June. It has been running on the dump-pile, which is too poor to pay for water-power at the usual rates. When the Zeile mill is running to its full capacity the Oneida mill can get motive-power at trifling cost, as the water from the wheel is used over again in the Zeile ditch. The ten stamps at the Oneida therefore are expected to start up as soon as the 40 stamps of the Zeile get to work. The Plymouth Con. is employing only four men. The cause for this suspension is not very clear. The impression widely prevails that stock manipulation is at the bottom of it. If this is the correct explanation the prospect favors a protracted period of idleness. Some exceedingly rich ore has been struck lately in the 200-foot level of the Gover. The Zeile is taking on more miners preparatory to starting the mill to its full capacity of 40 stamps.

Butte.

A RICH STRIKE.—Oroville *Register*, July 27: In an early day in Butte the Blackleg was an important gravel mine. It is situated near Nimshew, and though known to be valuable, no work has been done upon it for many years. A tunnel about 1200 feet long was run to reach the rich pay gravel, and this tunnel was considered so dangerous after the mine had been worked a year or two that the mine was abandoned. A well-known merchant of this town, Mr. Floyd Taber, was the last man to do any work in the tunnel. He was living in that region, and believing that the old mine still contained plenty of gold, went to work in it for a short time. He took out $6000. One day while he happened to be out of the tunnel washing some gravel there was a bad cave in the mine and work was at once stopped. Recently, Mr. John Malay, an experienced miner, was employed to open the old tunnel and extend it a short distance. He put the old tunnel in as good shape as possible and then ran a short distance in search of pay gravel. He was quite successful and struck dirt that paid splendidly. The object being to develop the mine, a second tunnel was run to ascertain the width of this pay streak. It was struck in the second tunnel and richer than ever. Five carloads when washed returned $50, or $10 per car. We learn that it is contemplated running a new working or main tunnel.

Calaveras.

THE RATHGEB.—*Prospect*, Aug. 3: A new shaft is being sunk at the Rathgeb mine and is now about 35 feet deep. Work will be resumed on the old shaft the first of September so as to get out ore enough to kept the mill running next winter.

Inyo.

CERRO GORDO.—Inyo *Register*, Aug. 1: Last week 98,000 shares of the capital stock of the Union Con. M. Co. of Cerro Gordo were transferred to D. O. Mills and Archie Farrington, the consideration being 43 cents per share. The company will be reorganized at once, and mining operations resumed at the mine on a large scale. An air-compressor of a three-drill capacity will be put in when crosscutting. The massive limestone belt constituting the mineral zone, in which the lead pockets are found, will be systematically pursued. The Union pocket alone produced over $8,000,000 in lead, silver and gold, and there is every reason to suppose that by systematic exploration other pockets as large or even larger will be found. When it is considered that the Cerro Gordo lead belt, or mineralized zone, has an east and west width of about 1000 feet and a north and south length of about two miles, and that but a very small fraction of this great mineralized fissure or zone has as yet been prospected or explored, the possibilities of its future production can hardly be realized or contemplated. The new company will proceed at once to the erection of an improved Bleichert elevated tramway, with a carrying capacity of 150 tons daily. The cost of carrying down ore from Cerro Gordo to the railroad is estimated at less than 10 cents per ton. The round trip from Cerro Gordo to the railroad and return it is expected can be made in less than one hour. Special cars for carrying passengers will be constructed, when one can experience the sensation of traveling in mid-air across valleys and gorges 500 feet below. A new town will be laid out on the Eastside canal at the 30-foot fall, where 300 horse-power is obtainable. A furnace and stamp-mill will be erected, to be run by water-power, where the Cerro Gordo ores will be reduced. It is calculated that ore, slag, flue dust, etc., can be sent from Cerro Gordo to the reduction works for 50 cents per ton. With the new deal at Cerro Gordo, all join in believing that prosperity will once again return to the county. Other capital will follow and invest in and open up adjoining properties.

FOR ORE TRANSPORTATION. — *Index*, Aug. 1: That the Union mines at Cerro Gordo will pass into the hands of a syndicate and be worked on an extensive scale is a foregone conclusion. Among those mentioned as interested parties are Archie Farrington, D. O. Mills, H. M. Yerington, Frank G. Newlands, Evan Williams, D. A. Fender and others. There is much good ore yet in the Cerro Gordo hill, and a vast quantity of what is popularly termed low-grade ore. The cost of transportation from mine to railway—$3 to $3.50 a ton—has hitherto rendered the handling and working of low-grade ore unprofitable. Prominent railroad officials who have recently visited Keeler have made preliminary surveys for a branch of the C. & C. to connect with a tramway from Cerro Gordo, which, once built, would reduce the cost of transportation to comparatively nominal figures. The plan is considered entirely feasible. Parties familiar with the locality estimate that 4½ miles of railroad and 2½ miles of tramway will supply the missing link and supplant expensive teaming.

Mono.

MONO.—Bodie *Free Press*, Aug. 5: During the past week south drift, from winze from main south drift, 1000 level, was advanced 17 feet. Southwest drift, 1200 level, was advanced 17 feet. West crosscut from south drift, 1200 level, was extended 11 feet. There were employed 17 miners, 1 foreman.

THE BODIE CON.—During the past week west crosscut No. 2 from north drift, 1200 level, was advanced 16 feet. Jointly with Mono west crosscut from joint upraise from main south drift, 1200 level, was extended 27 feet.

Nevada.

PROSPECTS.—*Tidings*, Aug. 6: One of the best prospects in the Grass Valley mining district is situated between the railroad track and the Idaho gap. It comprises 3000 feet of ground and is known as the O. K. and A. B. C. Consolidated, or South Idaho. A tunnel in the hillside a distance of nearly 400 feet, shows a 30-inch ledge in its face between slate walls, with numerous stringers converging. The ore is solid, though the ledge is but 60 feet underground, carries sulphurets and other minerals and is promising in all respects. The ledge runs east and west and pitches south at about 70 degrees. Messrs. Joseph O'Keeffe and James McKenna are working miners, supporting families, and have developed their property between "shifts." Michael Hogan owns an adjoining claim termed the Parnell. In the early days this was superficially worked with big profits by Easley & Ragan. An extension of the Parnell—the Gladstone—is owned by Messrs. Hogan and O'Keeffe. All of this ground, including the O. K. and A. B. C., comprises a portion of that claimed by Henry Hanssen as agricultural and the suit involving which was justly won by the miners. A shaft 27 feet in depth, on the O. K. and A. B. C., shows a 14-inch ledge of decomposed quartz which will undoubtedly yield from $12 to $15 by mill process.

Placer.

PICK AND SHOVEL.—*Herald*, Aug. 3: The gravel in the Mayflower is richer in the last upraise in the south gangway. A. Clark has sold the Orono claim at Bath to the Mayflower Co. This mine when opened will probably be as rich as the Mayflower. Breece and Wheeler are putting on more men. G. L. Threlkel and partners are well satisfied with the prospects in the May Blossom ledge above Last Chance. The Hathaway mill now has 20 stamps, but only 15 are running, owing to the lack of water. Very rich ore has been struck in the top lead about 150 feet east of the Butt's shaft. The White boys are taking out rich rock in the old Moore ledge on Duncan hill. Their receipts for last week were $1000. The quartz at the bottom of the shaft is of a singular quality. It can be picked to pieces with the fingers. The Gray Eagle tunnel is now over 50 feet in length and in soft rock. Only four men are employed at the tunnel. The running of the tunnel will be done on contract. Anthony Clark is still prospecting the Big Channel mine.

GOLD RUN.—Cor. Placer *Republican*, Aug. 3: Everhart is drifting in his quartz mine and expects to tap the ore vein very shortly. They have taken good pay from his mine and several S. F. men have offered good money for it, but Mr. Everhart does not propose to sell at figures offered. Mr. Gayetty is still taking out ore from his rich mine. He expects some S. F. parties, who have become interested, here in a few days, and then they will look the ground over for the purpose of erecting a stamp-mill. Several prospectors are working in this vicinity on quartz ledges that show up well so far.

ECLIPSE.—Placer *Argus*, Aug. 4: The Eclipse mine near Ophir is being reopened. This mine has always paid and they expect to put up a mill shortly. The Frue concentrator at the Hathaway mine works like a charm. They will put in 10 additional stamps before long. Preparations are being made by Capt. Hubbard to resume work on the Gold Blossom. Shurtliff is at work on the old St. Patrick mine, and has had some fine cleanups lately. Col. J. W. McCullough has resumed work on the Minna Rica mine.

Plumas.

GOLD.—Plumas *National*, Aug. 3: Mr. Nelson brought in 110 ounces of dust to Thompson & Kellogg's the other day; this was made by one day's work; $2000 for a day's work is not bad. There is some hope of the Green Mountain starting up, as there is to be a detail survey made on the mine this summer. The Little Jameson claim is still in litigation, and hence nothing is being done with it. Some talk of a compromise. It would be a good thing, as it would permit a wonderfully rich mine to be opened up.

Shasta.

BEECHER.—Shasta *Courier*, Aug. 3: The shaft on the Beecher mine near town is down 40 feet and the ledge looks well. The work is not progressing very rapidly, as the force is small. If it is the desire to prospect the ledge to any great depth before the rains come to fill the shaft, more working force will have to be put on.

MILL.—It is stated that a mill will be put on the mines sold by Coleman near the old Dingee place on the Shasta and Centerville road. Considerable work has been done on these mines, and although the ore is not of high grade, it is thought that it will pay well for working.

Sierra.

STRUCK THE PAY CHIMNEY.—*Tribune*, Aug. 2: Another contract to run 100 feet farther on the ledge was let last week by the San Luis Mining Co. of this place. No sooner had the party started at work on their contract than they encountered the pay chute, which has caused all the stockholders to feel jubilant. John Rose went up to the mine Tuesday and brought down some of the rock with him. He pounded it up in a mortar in the evening and obtained very large prospects. The lower tunnel is now in 1000 feet, and this is the first time that pay ore has been discovered. They felt confident that the pay chute would be found by running the tunnel ahead, and their labors were well rewarded by encountering the well-defined pay chute as given above last Monday. The company has spent over $12,000 in developing the mine, and it now looks as though they might receive good interest on their money.

GOLD BLUFF.—*Mt. Messenger*, Aug. 3: Work at the Gold Bluff is progressing slowly. It will take two weeks more to finish the pipe, which is being made by J. W. Brown. We learn that the Happy Hollow drift mine at Port Wine is paying finely. The Riffle mine between Port Wine and St. Louis is yielding nicely. The Excelsior Drift Mining Co., near St. Louis, has a tunnel in 913 feet and will raise a shaft when the thousand-foot mark is reached. The San Luis Quartz Co. have struck the ledge in their tunnel on the south side of the river and about a mile below Sierra City. The strike has caused quite an excitement at Sierra City.

HOG CANYON ITEMS.—The Primrose mine owners, Messrs. Omsly and Pearson, have arrived here to put into shape and start up this formerly well-known mine. Mr. Omsly will be superintendent. I believe he had charge of it once before, and he is a pleasant, energetic gentleman, and after about one month's repairing will put on a force of men to thoroughly develop the property that many years back produced as much as $200,000. The owners will survey their several claims this summer and fall besides pushing the workings in the mine ahead. The Colombo mine and mill are running full force. It is reported that they have good milling rock and fine prospects. Parties from San Francisco and owners of the Buffalo mine are having the rock tested below, and if the results are satisfactory will try to get a controlling interest and pay off the debts and run the mine on a different process. All the recent workmen and practical miners have the greatest faith that the property can yet be made to pay handsomely. There are two different quartz-mills going up in the vicinity of Gold valley.

Siskiyou.

QUARTZ MINES.—Yreka *Journal*, Aug. 1: The Gold Run mine at Know Nothing creek, in this county, owned by Radelfinger & Dannenbrink, is one of the best-paying ledges in Siskiyou, but the mill is now idle from lack of water to turn the wheel. On first tapping the ledge last spring, in their tunnel, they realized $6000 from 23 tons of quartz taken out, and from 300 tons taken out since realized over $29,000. They started below last week to procure additional machinery and extras for their mill to get it in good order for winter. Bennett & Co. are running their mill on Know Nothing creek, and realize about $40 to the ton. Charley Abbott is still continuing to take out quartz from his ledge on Greenhorn creek, about two miles from Yreka, and says he intends following quartz mining hereafter, it being the only occupation he has yet made a success in. He has a good ledge. Heckathorn & Co., on Greenhorn, are also taking out very rich quartz, and have one of the finest ledges on the coast, easy to work and full of exceedingly rich streaks. We hear a report of parties considering the matter of organizing an extensive mining corporation for the purpose of tunneling the Humbug mountain range on the west side of Yreka, which is believed to contain numerous rich paying ledges of quartz, with a certainty of also being able to obtain a good supply of flowing water for running mills and for placer mining. The Warren quartz-mill on Yreka flats was shut down last Friday for a cleanup of the quartz from F. J. King's quartz ledge at Spring gulch, north of town, which, it is thought, has paid a good average yield per ton. The Empire quartz mine and mill at Empire Creek, Klamath river, near Honolulu, has been bonded to a Portland company for $10,000, and work will be started up soon in developing it. The prospect for a good ledge being found is very favorable, and the mill is one of the best water-power mills in the county, with Klamath river supply to run it.

DOING WELL.—Yreka *Union*, Aug. 1: Many miners in what may be termed the vicinity of Yreka are not only doing well, considering the peculiar dryness of the season and lack of water, but have splendid future prospects. The same encouraging reports come from many other sections of the county. The fact is there is a large amount of profitable mining to be done yet in Siskiyou. Last week a young son of G. W. Cooper, accompanied by a companion, was out a very little distance from Yreka and in prospecting around he picked up a piece of quartz that showed a large proportion of gold.

San Diego.

HELVETIA.—Julian *Sentinel*, Aug. 3: Murray & Smith are pushing things right along at the Helvetia. The tunnel is 180 feet, with pay ore in sight. Hoisting machinery and a ten-stamp mill will soon be on the ground.

WASHINGTON.—Messrs. Keener & Dilks have completed the work of cleaning out the old shaft at the Washington mine, and are now retimbering the same. It is well to state that the ledge in the bottom of the shaft is just as it has always been represented, "chuck full o' gold." Sheriff McDowell and T. J. Daley, the owners, are expected here daily, when the contract will be let for sinking the shaft 100 feet deeper.

EXTENSION.—Four men are at work trying to develop the extension of the Golden Chariot mine. They are down 40 feet with their shaft, and will soon begin to crosscut. Tommy Roland and Wm. Maher are driving their 300-foot tunnel to tap the Fraction mine. They are in 28 feet with good ground ahead of them.

HIDDEN TREASURE.—D. D. Bailey has commenced operations on the Hidden Treasure mine and says that everything looks well. Sid Wilcox, while prospecting the other day, found a quartz vein which shows considerable free gold.

THE RICHMOND MINE is pushing things lively. They are now in 15 feet with their new tunnel. The tunnel will be run night and day until finished.

THE SOUTH HUBBARD is working, with plenty of good milling ore in sight. The vein is three feet wide and shows considerable free gold.

OWENS.—The work of retimbering the old shaft at the Owens mine is completed, and the miners are now crosscutting for the ledge.

Trinity.

KNOW-NOTHING CREEK.—*Journal*, Aug. 3: Mr. D. Hansen of this place, who is largely interested in the mines in this region, returned from a visit to his property last Monday. He reports everything as progressing satisfactorily with every indication for a good camp. The Gold Run shows good ore, averaging $70 per ton, which is being extracted and put through a four-stamp mill. They are working from two levels and in a short time will open up another level. The water supply by which the mill is run has now run short, but a new ditch is being dug and it is expected that it will furnish enough water to run during the entire season of 1890. The ledge averages about 2½ feet, and the ore is free milling. The Know-Nothing mine is paying very well and the owners feel well satisfied with the outlook for one of the best mines in Northern California. A four-stamp mill is kept running day and night on this property with excellent results. The ore is being extracted on two levels, and, while it is not of the highest grade, it pays steadily, and from it the owners will reap handsome dividends. Mr. Black is an experienced miner and works everything to advantage. The Hansen mine is not fairly developed, but with R. Junkans as superintendent it is being prospected; it will no doubt soon become a paying property. Mr. Hansen informs us that the trail from New River to Know-Nothing Creek is a good one, and that the route via Weaverville, North Fork and New River is the most convenient one by which to reach the mines in the above-named section.

A GOOD CLEANUP.—The superintendent of the Trinity gold mine on Oregon gulch mountain came in from that mine last Monday with two lumps of gold fresh from the retort as fine as we ever saw. These were the result of a short run, but nevertheless it was an average of a little over $500 for each 24 hours that water was on the mine. This is a sample of what could be done with a good supply of water from Rush creek or Stewart's Fork. The owners are well satisfied with their season's work. This is one of the largest mining enterprises in the State and nothing but a limited supply of water has prevented the owners from being millionaires to-day.

THE NORTH STAR. — Arrangements have just been completed for a sale of five-sevenths of the North Star mining property, including ditches and water-right. San Francisco capitalists have taken hold of the property to the extent above mentioned, while Henry Junkans retains two-sevenths interest in the entire property. The mine will be worked under the immediate management of Mr. Junkans, and active operations will begin as soon as possible. A 10-stamp mill will be shipped immediately. Great developments are looked for in East Fork during the present season. Mr. Peterson expects to have his mill running in a few days, and it will be but a short time before the Enterprise company will have their mill running at full speed.

Tuolumne.

POCKET.—Tuolumne *Independent*, July 23: Last week a pocket was struck on J. T. Faxon's mine on Saratoga hill, and 163 ounces taken out, yielding $2934. A small pocket was found some time ago of 45 ounces, valued at $846. Mr. W. C. Oakes is running the mine, and Mr. Faxon gets one-third of the output.

MILL.—On dit, that Mr. Bryant of Boston, Mass., intends to build a mill on the Atlas mine at Jackass Hill. Two men are now prospecting, and the outlook seems to justify the proposed improvement.

SOLD.—It is rumored that the Patterson mine at Tuttletown has been sold, and that the new owners will get to work soon and sink the shaft 400 feet deeper.

NEVADA.

Washoe District.

OPHIR.—Virginia *Enterprise*, Aug. 3: The upraise on the 1465 level still continues in porphyry.

HALE & NORCROSS.—On the 400 level the north raise is up 59 feet. It continues in good ore. On the 500 level an upraise has been started from the face of the east crosscut. It is up 15 feet in ore of good quality. On the 600 level the west drift is out 282 feet, where it reached the west clay wall and was discontinued. A considerable amount of repair work is being done in the mine and in the shaft above the 300 level.

SAVAGE.—The prospecting drift west from the sixth floor is out 50 feet, in porphyry and quartz that give no assays. On the 500 level the drift from the upraise is out 128 feet. The joint west crosscut on the south boundary is out 410 feet, and is nearing the west clay wall. A good deal of repair work is being done and are easing and retimbering the main shaft.

GOULD & CURRY.—West crosscut No. 2 on the 300 level is in a promising mixture of quartz, clay and porphyry. West crosscut No. 1, on the 400 level, is being advanced in a formation of quartz and porphyry that promises well.

BELCHER.—The 1200 south drift is out 240 feet in quartz, showing spots of pay, but low-grade on the average. Have stopped the 200 west crosscut and started an east crosscut from the north drift 30 feet north of the shaft.

CROWN POINT.—The raise above the 350 level is passing through low-grade quartz. The face of the south drift on the 300 level also shows quartz carrying some metal. Other work making fair progress.

CON IMPERIAL.—The north drift on the 300 level is still showing clay and quartz in the face.

The joint Confidence-Challenge and Imperial north drift on the 500 level is now in 30 feet from the Yellow Jacket shaft, 10 feet having been added during the week. The face shows quartz, giving low assays.

CONFIDENCE.—The joint Confidence-Challenge and Imperial north drift on the 500 level is now in 820 feet from the Yellow Jacket shaft, 10 feet having been added during the week. The face shows quartz giving low assays.

CON. CALIFORNIA & VIRGINIA.—The usual quantity and grade of ore is being extracted from the various openings on the 1400, 1435, 1500, 1600, 1650 and 1950 levels. Are shipping the usual amount of ore to the mills.

SIERRA NEVADA.—The east drift on the 520 level is still passing through porphyry that contains numerous clay seams and some water.

SEC. BELCHER.—Are now running south on the 1100 level from crosscut to connect with the Overman works to obtain air circulation.

MEXICAN.—On the 1465 level No 1 crosscut is passing through a mixture of porphyry and quartz of a promising appearance.

POTOSI.—The 750 level south drift continues in porphyry and quartz, and the 500 level west crosscut in clay and porphyry.

OVERMAN.—A good deal of prospecting is being done in all parts of the mine, and some paying ore is being encountered.

OCCIDENTAL.—The new mill is doing good work. The usual amount of ore is being extracted from the 300 and 400 levels.

SILVER HILL.—The 800 level northwest and northeast drifts are showing no important change in formation.

UNION CON.—West crosscut No. 2 on the 1465 level is still in a favorable mixture of quartz, clay and porphyry.

NEW YORK CON.—The ore in the upraise above the 800 level is widening and showing improvement in grade.

SCORPION.—The joint Sierra Nevada east drift is out 926 feet. It shows some water at the face.

JUSTICE.—The ore-producing sections are looking well and the mill is kept in constant operation.

BEST & BELCHER.—The usual prospecting work is being done on the 455 and 1000 levels.

YELLOW JACKET.—Are shipping 100 tons of ore per day; average assay, $26 a ton.

BALTIMORE.—Usual progress is made in explorations on the 338 and 225 levels.

CHALLENGE CON.—Work here same as in Confidence and Con. Imperial.

ANDES.—The usual prospecting work is being done in the upper levels.

NORTH OCCIDENTAL.—The usual prospecting work is being done.

ALPHA.—The 500 level west crosscut is still in low-grade quartz.

UTAH.—The north drift on the 600 level is still in vein porphyry.

ALTA.—Mill running on ore from the stopes on the 925 level.

BULLION.—Still exploring the 700 level quartz belt.

BENTON.—Grading a site for a hoisting plant.

Burner District.

SHIPMENT. — Tuscarora *Times-Review*, Aug. 1: Will Strickler came in from Burner district last evening, where he is developing a mining claim. He has good ore, and will make another shipment in a short time.

Galena District.

CHEROKEE.—*Silver State*, Aug. 1: A G. Higbee, who has been prospecting the Cherokee mine at Galena, has developed quite a body of galena ore which assays $150 in silver to the ton. A tunnel has been run on the lead and is in 125 feet and the whole face of it is galena ore.

Pioche District.

THE RAYMOND PUMP.—Pioche *Record*, July 27: The twelve-inch Cornish pump at the Raymond shaft of the Pioche Con. Co.'s works was successfully started Thursday evening at about 7:30 o'clock, and began throwing water from the 1200-foot level. The event, which had been looked for for some time, created as much interest in the general public as when the pump was first operated by the old Raymond & Ely Co. Since the mine closed down under the Raymond & Ely Co. in 1880, no work has been done, and when the present company took hold last January and began vigorous work, it was seen that the shafts from top to bottom, in both compartments, must be overhauled. During the years in which the shafts lay idle heavy caves occurred, tearing out several lifts and two or three hundred feet of the pump column and rods, which, in falling, demolished things generally, and all timber in the shafts was decayed and unsound. Both compartments are now retimbered and cribbed from top to bottom. About 250,000 feet of lumber has been used.

IN THE PUMP COMPARTMENT the work has been finished off in a manner calculated to make it last for many a long year. The plunger pumps originally rested on the shaft timbers and their weight no doubt assisted the several caves which occurred. They were found about the bottom of the shaft. In replacing them they were placed on heavy timbers, set in solid rock, the ends being first tarred. A change which it is believed will materially increase the flow of water and which will undoubtedly reduce wear and tear has been made at the bottom of the shaft. Formerly the rod of the lift pump worked inside the column for 160 feet. The change substitutes a piston on the end of the pump rod, working outside the column through a stuffing-box with a valve-chamber, thus taking the weight off the bucket on the down stroke and increasing the capacity of the pump. The shaft being now open to the 12th or water level, the next step is to free this level of water, when the Black Ledge above the water line can be reached and explored. As soon as possible thereafter the machinery over the back winze will be brought out and overhauled, when the real work of battling with the water will begin and at the point where practical operations in the mine were suspended by the Raymond & Ely Company nearly 10 years ago. The most expensive portion of the work is now regarded as accomplished and thus far about $50,000 have been expended.

Tuscarora District.

BELLE ISLE.—*Times-Review*, Aug. 2: West crosscut, 250-foot level, extended 18 feet, passing through a vein of low-grade ore three feet wide.

COMMONWEALTH.—North drift from west crosscut has been advanced 12 feet; exposing some ore. North drift from north stopes advanced 10 feet, total 45 feet, developing good ore. West drift from same point advanced 27 feet in vein porphyry, with bunches of ore mixed through it. East intermediate drift, top of No. 11 chute, has been advanced 15 feet, following a seam of high-grade ore. East crosscut from No. 14 chute advanced 10 feet. South drift from No. 3 winze advanced 11 feet, total 84 feet, all in the vein, with seams of good ore. North drift from No. 1 winze extended 14 feet; total 119 feet. The stopes throughout the mine continue to look well. Two hundred and twenty-four tons of ore have been sent to the mill, average battery assay $140.47 per ton. Bullion shipped, $12,259.53; bullion on hand, $17,000.

NORTH COMMONWEALTH.—Joint crosscut, 225-foot level, extended east nine feet; the face is looking very favorable for ore. East crosscut from the south drift, 100-foot level, extended 16 feet; the face continues in concentrating ore with seams of high-grade mineral.

NORTH BELLE ISLE.—West crosscut from the 300-foot level station extended 27 feet; the face is in favorable-looking ground. The retimbering of the north gangway, same level, has been completed.

NEVADA QUEEN.—South drift from 150-foot level of Commonwealth has been extended nine feet. Some high-grade ore is showing in the face and is looking favorable.

DEL MONTE.—East crosscut from north drift, 100-foot level, extended 10 feet, passing through 10 inches of very high-grade ore. The face is still in low-grade ore.

GRAND PRIZE.—Pump is in position and will be started up the coming week. The reduction of the milling ore now on the surface will be commenced to-day.

NAVAJO.—Upraise from south end, 350-foot level, extended 10 feet, and continues to yield some high-grade ore.

ARIZONA.

MINERAL PARK.—Mohave *Miner*, Aug. 3: Mr. Sherman is taking out rich ore in his reserved stoping ground, and still has a nice body of ore in sight in the Queen Bee. Joe Boland and John Barkel are hard at work on the old La Porte, one-half mile southeast of town. They have large quantities of low-grade ore in sight. Messrs. Maynard, Murphy and Coon have a very flattering prospect on the Sabbath Bell mine, three-quarters of a mile easterly from town and near the Lone Star. The Keystone mill shut down last Sunday night, not for the want of ore, but for the want of mill supplies.

HACKBERRY.—Carey and Merrill have taken out three tons of rich ore from the Jeannette mine. Six men are at work sorting the dump of the Hackberry mine, and claim that they are making good wages and have now a carload about ready for shipment. Wm. Miller and H. W. Hitchcock in sinking a shaft in the Crescent mine 100 feet deep struck an eight-inch streak of ore which will make the Crescent what it was in its palmiest days. The Old Dump mine, southwest of the Old Hackberry, is a new discovery by Henry Munson and George Lockwood. They have taken out a ton of ore which goes 813 ounces.

HENSON & PARK—LESSEES QUEEN BEE.—In the face of the drift 100 feet from the 75-foot shaft they have a fine body of ore which appears to be the richest ever taken from the mine. Very soon the lessees intend putting on a night shift and running the drift in as rapidly as possible. So far the ore has improved in quality and appearance as the drift enters the mountain, and the ore body has widened out with the richer ore.

COLORADO.

TEN STAMPS.—Silverton *Miner*, July 27: Hemphill & Wyman, the leasers of the Mastodon, have ordered a plant of 10 stamps, and the batteries will be set up in the old concentrator up Mastodon gulch. They have an abundance of good milling quartz. The Pyramid this week increased its force by eight men. The water which has caused so much trouble in the shaft is now under control, so that the ore can be readily mined. The streak in the bottom is 18 inches thick. A Cameron six-inch pump has been shipped for the San Juan Chief mine at Mineral Point, and the engine and boiler will be moved from the mill to furnish the power. The mine workings, consisting of 300 feet of shafting and 130 feet of drifting, are full of water, and it is expected to get it clear within two weeks after starting the pump. Wm. Sullivan has made an important strike on the Bandora claim at the head of South Mineral creek. The discovery was made in the contact between the quartzite and lime and independent of the Bandora vein. The ore is found in paying quantities, and brittle silver is scattered plentifully through the rock. This is the first strike on the contact. The lessees of the Caribou mine are now shipping their entire dump to the Durango smelter, and have contracted for the delivery of between 1500 and 1800 tons. The rock is calculated to run $30 to the ton. Dick, Ingersoll & Co., who are located in Icelake basin, have completed their stamp-mill, and it has now been running eight days.

DAKOTA.

PYRITIC SMELTING.—Deadwood *Pioneer*, July 30: The departure of J. K. P. Miller and O. P. Ankeny for the Rapid school of mines on Sunday, revives the statement that a ten-ton stack has been ordered, will be put up at the school of mines, and that a thorough and practical test of the process will be made. A gentleman from Rapid yesterday, stated that he positively knew the stack had been ordered.

KEYSTONE CHLORINATION WORKS.—As stated in Sunday's *Pioneer*, cleanup has commenced at the Keystone chlorination works, Garden City. Col. Keith leaves for Denver in a few days to purchase the rolls of which mention was made and which will be substituted for stamps.

IRON HILL.—Everything is in readiness to begin ore treatment at the smelter. Fires were lighted and furnaces dried some days ago. Steam is up at present. Five men were at work Sunday and more went over yesterday. Though it is announced the run will be brief, probably not to exceed 10 or 12 days, the public nevertheless looks for important results in the amount of bullion produced.

IDAHO.

VREKA DISTRICT.—Wardner *News*, July 27. The addition to the concentrating-mill of the Emma & Last Chance Co. is now in course of erection, and when finished will form an extension of the main building, measuring 24x56 feet. The Pelton water wheel will be in place next week.

TYLER.—Another mine on the famous mineral belt surrounding Wardner will soon again wheel into line as a producer by furnishing its quota of ore to the mill and concentrates for transportation. The Tyler mine on which work was closed on June 24, 1888, is again the scene of active operations, and the resumption of work within its limits is but a forerunner of similar demonstrations that will soon be visible on numberless locations in a surrounding distance of several miles.

DEADWOOD GULCH.—The hoisting works at the Inez mine are now in complete running order and meeting all expectations. The plant is 80-horse power, is sufficient to hoist from a depth of 1000 feet and is the most effective and complete piece of machinery of the kind yet imported here. The work of sinking on the Inez is progressing rapidly, and a body of fine ore is exposed in the 100-foot level.

HUNTER DISTRICT.—The flume of the Morning M. Co., at Mullan, was completed on Friday, and the tramway and concentrator will be ready for work in a week or ten days.

LOWER CALIFORNIA.

ALAMO.—*Lower Californian*, Aug. 5: The news from Alamo this week shows a gratifying energy in business as well as mining. Preparations are being made to move en masse to the new town site, and by the 15th of August the old camp will be deserted. Substantial buildings will be erected at once. There seems to have been some truth in the rumors of a new placer discovery 10 or 15 miles southeast of Alamo. The gold is coarse, like that of Mexican Gulch, but there is not enough of it to justify a rush. Reports come in almost daily of new finds, but no rich placer diggings will be opened until the rainy season sets in, for the scarcity of water precludes working with anything but dry washers, which at best are inexpedient. During the past few days denouncements have been made of a number of leads in the vicinity of Alamo. The work on several mines has been suspended on account of the heat, but on others the development goes right along. The mines of the International Co. will be forced to lie idle until timbers arrive. Percy Douglas is at work with a gang of men clearing the road in Los Cruces canyon. Enough money has been subscribed to pay for clearing the entire road of bad rocks, but more money is needed if grading is attempted.

THE ACCIDENT MINE AT THE REAL.—L. B. Howard, who is in charge of El Accidente mine near Real del Castillo, was here Tuesday, and returned the same day. "The mine is owned and operated by the Occidental Mining Co., composed of D. D. Dare, J. W. Collins and myself," said Mr. Howard to a *Californian* reporter. "We are organized under the laws of California as well as Mexico, and intend to work the mine for all there is in it. Three shifts of men are working night and day, and taking out about 20 tons of rock daily. We have got down 60 feet in the shaft, and have run a tunnel 175 feet besides stoping 60 feet. The men are in ore all the way, as the vein will average between four and five feet. We have leased the old Puebla stamp-mill and are running night and day on $12 to $40 ore, with a capacity of fifteen tons a day. I will be back next week on my way to San Diego with the clean-up."

MONTANA.

FLAT CREEK DISTRICT. — Phillipsburg *Mail*, Aug. 1: The road from the Iron Mountain properties is about completed and will soon be utilized in the transportation of ores and supplies. The road is 11 miles long, and the ore when the end of the road is reached is transported eight miles on a large flatboat by water to Paradise, the shipping point on the Northern Pacific railroad. A Portland company is actively engaged in Spring gulch, distant about six miles from Flat Creek, where they have some good properties. The company is called the King & Queen Mining Co., and development is under the management of Superintendent Jeldness. Quite a stir is going on, we are informed by Mr. Hall, at Trout Creek, where another Portland company is engaged in the development of some good placer ground. They are at present constructing a large bedrock flume, and expect a profitable investment.

GRANITE MOUNTAIN.—The output for the week ending August 1 was 49 bars of bullion, containing 76 288.13 ounces silver and 151.35 ounces gold. The Granite tramway is now running without making any stops for loading buckets. The output of the Drumlummon mine for the month of June was $126,200; working expenses $53,000. St. Louis parties receive about $400,000 monthly from Montana mines; and nearly $14,000,000 have been received during the past four years.

NEW MEXICO.

AN IMPORTANT STRIKE.—Silver City *Enterprise*, Aug. 2: Probably the most important strike made in this section of New Mexico in years has just been made on a claim adjoining the Pacific on the west, and which is under bond to the Pacific people. The strike was made about 100 feet north and 30 feet west of the point where the tunnel cuts the Pacific lead. The ore will average from 42 to 49 inches in width, and runs $25 in gold besides the silver and lead. This same lead crops out on the surface, but is only about 15 inches in width, upon which some surface work has been done. The importance of this strike can hardly be exaggerated, as such an immense body of high-grade ore when properly opened up, will easily produce as much ore as both of the new mills can handle. From all reports of this strike, there need no longer be a doubt as to the future of Pinos Altos camp. The Minnesota crosscut tunnel has intersected the vein of that name. The ore vein is showing well, and the ground now opened will afford an immense amount of stoping reserves which will enrich the plucky little owner and mining man, Harry Fowler. J. D. Smith and J. W. Stone, two well-known mining men, have struck very good ore on Holt creek, in the Mogollon mountains, east of Pleasanton. Paul Curtis, who has been at the Old Man mine for several years, last week sold his half interest in a lease on the property for $1500 and on Monday left for California. The Pacific has been running only a part of the time since it started up, owing to a lack of transportation facilities. The class of ore treated has been of the lowest grade. The *Enterprise* is pleased to note that the shipping of iron ore from this point has again commenced; an average of three cars from the Hanover district is loaded and shipped daily. J. R. Johnson came home on Saturday last with the returns of the ore shipped from the Old Man. The ten tons of ore shipped returned $8435, which is not only gratifying to the lessees, but also shows that a little energy, well directed, is not wasted in this country.

OREGON.

PINE CREEK DISTRICT.—Cor. Bedrock *Democrat*, Aug. 1: Bonanza basin is situated about two miles from Cornucopia in a northwesterly direction. It is a depression in the side of the mountain facing the east and is about three-fourths of a mile across. The elevation above that of Cornucopia—which is 4350 feet above sea level—is from 2000 to 3500 feet. There are at present eight well-defined ledges known to traverse this basin. Upon these eight ledges over 40 locations have been made. As we pass over the "hog back," as it is called, a short distance, we come to the Last Chance mine, a ledge of from 3 to 6 feet wide on the surface and increasing in size as it goes down. The ledge is exposed nearly the entire length of the claim and shows to be a true-fissure vein. Assays run from $90 to $350, and it will mill $150 as the quartz is taken out. There is also a parallel ledge on the same ground that shows up well. The Stella shaft is sunk 25 feet and shows a four-foot vein of $13 rock. The Queen of the West is to the north but a short distance. It is a five-foot vein and the grade of ore is high. The Belcher is to the south of the Stella and shows a ledge of from six to seven feet wide. Assays run from $12 to $60. The Red Boy lies to the north, and a shaft 80 feet deep shows up a strong vein from three to six feet wide. The grade of ore is high and the dump will mill over $100 to the ton. To the east lies the Mountain Chief. This is a bold ledge of from four to eight feet wide and an average sample assays $43.28, a large average for a ledge of this size. The Mammoth lies to the northwest and is a ledge from 10 to 16 feet wide. The pay streak lies upon the footwall and is about six feet wide and samples $29.82. The rest of the ledge being very low grade runs from $4 to $7. The Greenhorn is near the center of the basin and is a well-defined four-foot vein; an average sample assays $120.13. The Star of Texas is high up in the basin and a 20-foot shaft shows a vein 3½ to 4 feet, averaging $38.03. Silver predominates in this ledge. Some of the remaining locations that have a very promising appearance, by showing ledges from two to five feet wide and assaying from $10 to $20, are as follows: Independence, Morning Star, Yukon, Garrison, May Queen, Golden Chest, Climax, Little Joker, Centennial, etc. There is surely a great future for this vast group of ledges. What a splendid opportunity for a company to run a tunnel into the mountain and tap all of these ledges. A tunnel 2000 feet in length would cut these ledges from 2000 to 3000 feet deep.

ASSAY OF BLACK SAND.—J. H. Fisk in *Oregonian*, Aug. 3: In the *Oregonian* of to-day I notice an inquiry as to the average "Assay of gold in black sand" from the coast of Oregon. I presume you wish to know the average assay of the black sand for the gold it contains, and not the assay fineness of the gold after separation. In answer, I beg to say that I have made many assays of the black sand in the past 20 years, and it is very difficult to say what the average value of the sand is in gold, for in many places it contains no gold at all. Near the mouth of the Coquille river, and at Cape Blanco and Port Orford, when the tide is low, the black sand is found near the surf, several inches in thickness, very rich in gold and platinum. This sand will assay from $10 to $50 per ton. Again, back in the interior, up on the Mackenzie river at Mackenzie's bridge, there is about six inches of this black sand which is very rich in both gold and platinum. This sand is composed mostly of titanum or titanite of iron.

UTAH.

ORE AND BULLION.—Park City Cor. Salt Lake *Tribune*, Aug. 4: Bullion shipments: July 28, 15 bars Ontario, 8559 ounces; August 3, 15 bars Ontario, 8540 ounces; August 1, 18 bars Daly, 19,736 ounces. Received at Park City sampler for week ending August 2; 639,050 lbs. Ontario ore; 218,300 lbs. Daly ore; 38,550 lbs Jupiter ore; 227,200 lbs. Mayflower ore; 124,250 lbs. Union concentrates; 79,300 lbs. Woodside ore. The Crescent Co. shipped during the week 90,000 lbs. of concentrates. The long-delayed boring machine for the Anchor shaft arrived here this week, and is in position, and in a day or two operations will be commenced. Messrs. William H. Bennett and Cornelius Hunt sold out their interest in the Mayflower lease this week to Salt Lake parties. The price received is said to have been $8000 each.

STRIKES REPORTED.—During the past week a rich strike was reported on the Wasatch mine which is being worked on a lease. An assay made shows the ore to go 89 ounces in silver and about 10 per cent in lead. The fortunate lessees are James McCune, E. C. Williamson and John Farrish. The announcement of a big strike in the Comstock mine on Tuesday was the all-absorbing topic in mining circles during the week. A visit to the mine showed the report to be well founded. The vein is a true fissure vein between well-defined walls of porphyry and quartzite. When first struck the vein was only six inches wide, but in drifting about 25 feet the ledge has widened to 6½ feet. The pay streak is about 2 to 2½ feet, the ore being galena and carbonate. The vein was cut in the lower tunnel at a depth of about 100 feet from the surface. Preparations are being made to put the property in good shape for shipping ore.

MECHANICAL PROGRESS.

The Superiority of American Hardware.

There is probably no line of business in which American skill has been more prominently displayed than in the manufacture of hardware. It is in fact an embodiment in many ways of the genius of our people. We do not now so particularly speak of the numerous inventions, but more especially in a general way of the greater excellence of American hardware as compared with the foreign product.

In beauty of finish, in attractiveness of appearance and in enduring quality the American edge-tools are the best in the world. Retail hardware shops in London make a specialty of them, and advertise them as a means of drawing custom.

In Australia we compete successfully with England in every variety of hardware. Our cast-iron locks are fast taking the place of the heavy wrought English article, while our axes are notably the finest that are made, and the export trade is a very important consideration with Eastern ax-makers.

Our saws have gone around the world. They are to be found in Africa, India, South America and the continent of Europe. We sell shelf hardware all through France and Germany, because it is not only cheaper, but better than anything they can produce at home.

It has been about conclusively established that our machine-made files will do nearly, if not quite as much, work as the foreign hand-cut file at a cost of half as much.

The export trade on steel goods has grown to great proportions, because no other country makes anything as well adapted to the purpose for which they are required.

Augers, bits and such boring tools are models of beauty and perfection. We actually export such heavy goods as carriage and tire bolts to Africa and Old Mexico, South America and Australia, where we come in direct competition with German and English manufacturers. We might go on enumerating did space permit, but suffice it to say that almost every Eastern manufacturer of note is experiencing a constantly growing demand from abroad for his goods, because where they have been once introduced the consumer will not be content with an inferior article.—*Age of Steel.*

MORE EXPERIMENTS WITH POWDERED COAL. Erastus Wiman and others are experimenting with a new process of heating iron with powdered coal instead of natural gas. The experiments are being conducted at the Vesuvius Iron Works, Pittsburg, and are said to be satisfactory. Speaking of the test, Mr. Wiman said: "It is as yet rather limited in its scope, but eminently satisfactory in its results. One heat consumed 684 pounds of pulverized coal. The quantity of iron heated by that quantity of fuel was 4600 pounds. We are confident, from the present results, that we can heat iron at 50 cents per ton, including the cost of pulverized coal, while the existing rates for natural gas at the different mills make the cost of heating iron upward of $1 per ton. While a contrast test was not attempted, the lack of facilities necessary for the perfect operation of the new experiment rendered the test successful in only a limited degree, but sufficient to prove that we can produce the same quantity of iron with the pulverized coal process in an hour as the natural gas facilities at present afforded can produce in two hours. Of course, while the tests thus far have proven satisfactory, unforeseen difficulties may arise in the future, although we feel confident of ultimate success in a very short time." The tests will be continued in order to remove all doubts as to the success or failure of the plan.

IMPROVEMENTS IN MECHANISM.—The progress constantly made in all branches of human industry is so rapid that it is often difficult to realize how much better equipped for the struggles of life people are now than they were 25 or even 10 years ago. There are, of course, many improvements that instantly occur to every one, but the strides made in some of the minor conveniences of life have been equally wonderful. In nothing has this constant improvement in any given specimen of mechanism been more apparent than in the sewing machine. The large and universal demand for such machines and the constant rivalry which has been kept up has stimulated to the utmost the different inventors and makers in this now indispensable article of domestic use. When it is understood that no less than 8,000,000 of these machines have been made and sold, one may readily realize the important part they form in the labor of the world.

PATENT YOUR INVENTIONS.—A dispatch from Findlay, Ohio, states that on July 12th F. J. Seymour, manager of the American Aluminum Company, died suddenly of paralysis. The deceased some four years ago secured patents covering a process for manufacturing aluminum. He had little difficulty in inducing capital to take hold of the enterprise, and the American Aluminum Company was organized, with Gen. Russell A. Alger as president, Senator Palmer of Michigan vice-president, and other stockholders of wealth, including Senator McMillan of Michigan, Mr. Peters of Saginaw, Michigan, and Col. E. A. Wood of Cincinnati. Just at that time the discovery of natural gas in Ohio was attracting national attention, and in order to utilize the steady and intense heat produced by it the laboratories of the company were established at Findlay. Expensive retorts and valuable machinery were constructed, and the manufacture was begun on a large scale and proved so successful that great quantities of the metal were placed upon the market at prices that gave large profits on the investment. The process, although patented in nearly all of its points, has been kept a religious secret, and no one has ever been permitted to penetrate the mysteries surrounding it. A 15-foot picket fence surrounds the buildings, with its gates doubly padlocked, while vigilant employes constantly guard the single door to the establishment. The secret of the process has been buried with Mr. Seymour. It was his invariable custom to await the critical moment in his work and then all the employes were excluded from the room, and alone he went through the processes which he never explained. The stockholders of the company are undetermined what to do under the circumstances in which they are placed, but will probably give some of their chemists full scope to rediscover the lost secret. The Aluminum Product Company of New York had purchased a rolling-mill at Findlay and were preparing to utilize the products of the other company by manufacturing valuable alloys, but it is feared that the project will now have to be abandoned.

CHILLED SLIDE VALVES.—We learn from *L'Ingenieur-Conseil* that M. Bollinckx is casting the valves of Rider engines in a mold which chills the faces. The chill penetrates to a depth of one-sixth to one-fifth inch. As the surface cannot be cut with a tool, it is ground with emery rollers until a perfectly true and polished face is obtained. It is claimed that not only do these surfaces not wear, but that, thanks to their exceeding smoothness, they do not wear the faces on which they work. Further, the coefficient of friction is naturally very small. The administration of the State railways has sent a representative to examine the application of the mode of construction to the slide valves of locomotives. Of course there is nothing novel in the idea of chilling a slide valve face. The plan has already been tried in this country and with a considerable amount of success. It needs, however, a very long time to demonstrate the advantages of a particular construction of slide valves.

COPPER STEAM PIPE.—The manufacture of steam pipes of copper, of comparative recent development, has been attended with results not more gratifying than invaluable. Their production is by means of electro deposition from sulphate of copper solution, the pipe being formed on an iron core in the depositing bath, and the copper deposited being pressed by a moving tool during the process of deposition, thus giving a fibrous strength to the crystalline copper. The shell or pipe is subjected to hot steam which separates it from the core also expanding the shell, and rendering it a marketable commodity. The pipe is without joints and has been found capable of very high resistance. —*Industrial World.*

AN IMMENSE GLASS GLOBE OR BUBBLE.—In the French crystal department at the Paris Exposition is an enormous glass bubble perched on a stand like the world on the back of Atlas. Its diameter is 1 meter 55 centimeters, and its volume 1950 imperial quarts. It weighs 22 kilograms. For the information of the general public who prefer to understand these things from a material point of view, we are informed that it is capable of holding nine casks of wine. It is said it has never been equaled in the history of glass-blowing. The bubble is pure as crystal and without the slightest blemish.

IMPENETRABLE SHIP PLATES.—The British naval authorities believe they have secured plates absolutely impenetrable by missiles hurled by any great gun at present invented. The discoverers of the secret are said to be two well-known firms—John Brown & Co. and the Beardmore Co.—who are each casting a steel plate by the new process, 10 inches thick, for experimental purposes. They profess themselves as perfectly confident as to the ultimate result of the test, which will be of an unusually exhaustive character, and take place at Portsmouth.

WOOD PULP GASKETS.—Attention is called to the employment in France, for steam and water-pipe joints, of gaskets made of wood pulp, which are claimed to be more economical than the ordinary rubber gaskets, and are not subject to decomposition by high temperatures. Care is taken in the preparation of the pulp to select woods free from ingredients which might attack metals. The compressed pulp gaskets are boiled in linseed oil, and in practical use have given, it is said, very satisfactory results. —*Iron and Steel Trades Review.*

COST OF STEAM AND WATER-POWER.—An elaborate article on this subject, based on actual work at a woolen-mill on the Merrimac river, may be condensed into the statement that the steam-power at that locality gave a total cost per horse-power of $52.50, against $19.24 for the water-power.

WIRE-RIMMED FLY-WHEELS.—Fly-wheels with rims of steel wire are now made in Westphalia, and may be run at three times the speed of cast-iron wheels, which are limited to about 40 yards per second for the rim.

SCIENTIFIC PROGRESS.

The Influence of Sunlight on Trees.

In the latest report of the head of the Forestry Department of the United States, reference is made to the effect of light on the growth of various trees. It is well known, says Prof. Fernow, that light is necessary for the development of chlorophyll, and, therefore, for the life of all green plants, and especially for that of trees. The heat alone, which accompanies the light, is not sufficient, although the relative influence of the light and the heat on the growth is still an open question, as well as the relative requirements of light on different species of trees. In the case of forest weeds, which in forestry serve as an indication of the amount of shade which the trees exert, and with their capacity of impeding evaporation, some require full sunlight for their development, others are averse to a high degree of light. To this must be due the change in the plants of a district when its forests are removed. Then the amount of shade needed is modified by site. Where the sunlight is strong, in higher altitudes, drier climates, or where the growing season is longer, or there are more sunny days, some species will endure more shade. The flora of high altitudes in general requires light.

Trees nearly always develop best, in other words, make most wood, in the full enjoyment of light, but their capacity of developing under shade varies greatly. The yew will thrive in the densest shade, while a few years overtopping kills the larch; the beech will grow with considerable energy under partial shade, where the oak would only just keep alive, and the birch would die. When planted in moist places all species are less sensitive to the withdrawal of light. In the open, maples, elms, sycamores, and others, grow well and make good shade trees; in a dense forest they thin out and have but scanty foliage. Conifers, such as spruces and firs, which preserve the foliage of several years, have, perhaps, the greatest capacity of growing under shade and preserving their foliage in spite of the withdrawal of light.

In America sufficient data to group the forest trees according to the amount of light required by them, have not yet been collected, but rules based on experience have been formed in Germany, where the behavior of trees under different conditions of light has been carefully studied. It has been found, for instance, that on the same branch, those leaves which are developed under the full influence of sunlight are not only larger and often tougher in texture, and thicker, but that they have a larger number of stomata or breathing pores than those less exposed to light. The whole subject is one of the utmost importance in forestry, and observations and experiments are to be carried out in regard to it in the United States.—*Builder and Woodworker.*

MEN WHO ARE NOT FIREMAKERS.—There are but few, even of the most rude and savage tribes of men, who are not acquainted with some mode of producing fire. Such, however, have sometimes been met with by travelers, and Dr. Finsch has recently met with such a people in New Guinea. He says that the people in the large villages that are buried in the forests along the shores of Astrolabe bay know of no means by which they can produce fire. It is therefore a duty devolving upon every member of the community to aid in preserving fire. All their cooking is done outside their huts in the open air, but in the center of each hut is a fireplace, and it is a crime to permit the fire to go out. Dr. Finsch asked the natives if they never lost their fire. He was told that such a calamity had occurred, and that they would never have had fire again if it had not been for a very fortunate circumstance. They know a tribe in the mountains away from the sea who possess the art of making fire, which they guard as a secret. One time the people were compelled to go to these firemakers for the spark that would rekindle the dead embers in their huts. They carried the fire for many miles. They were determined never again to be reduced to this necessity, though it made them feel very comfortable to think that they knew where to get fresh fire if they lost their own. It is to be presumed that these simple-minded natives have now ceased to guard the smoldering embers in their huts with such jealous care. A white man has been among them—one of the sort who brings blessings instead of evils in his train, and they know now that even if they never see a white man and the wonderful little fire sticks he carried with him again, they can, with the aid of friction and tinder, be their own firemakers.

A CYCLONE.—Cyclones appear to be more frequent and destructive than formerly in this country; but it is probably only in appearance, as there are more people in the country and more improvements to be disturbed by them, and more newspapers to bring the facts before the people, than in former times. That probably makes the difference between then and now. No way has yet been discovered of securing immunity against these dreadful cyclones which sweep across the plains and prairies of the West with irresistible force, says a cotemporary. No structure of human hands appears to be able to withstand their onslaught. Houses and barns are swept away like stubble before them, and the path of a cyclone is marked by general ruin and devastation. No preventive measures can turn them aside from their chosen way, and no shelter is availing which presents any surface to their fierce attack. Modern meteorological science can assign general reasons for their appearance, and can explain their nature and phenomena. They are known to be storms of wind moving in immense spirals or whirls precisely like the little whirls of dust we so often see on a warm summer day. But then larger whirls sweep onward over vast areas of the earth. They are usually from 200 to 300 miles in diameter, and sometimes much more. Their central point is calm, and this moves forward at the rate of from 2 to 40 miles an hour. These storms originate outside the equatorial belt between the tropics and move toward the poles. If there can be imagined a gigantic pegtop of wind, whirling rapidly on its peg and at the same time moving forward, an idea will be gained in a rude way of a cyclone. These storms in the Northern Hemisphere revolve from right to left; in the Southern, from left to right.

A Comet Falling to Pieces.

Prof. E. S. Holden of the Lick Observatory has furnished some interesting facts in regard to the comet recently discovered by Prof. Barnard. He says that the following facts may be deduced from observations recently made: The comet, which is now a long way past its perihelion, has lost all signs of the tail which it had when nearest the sun. No doubt the effect of the sun's action upon the head of the comet has become so small at its present distance (253,000,000 miles), that the head is no longer forced to give out those streams of matter which showed to us the comet's tail. But the comet was subject to immense strains and stresses in passing through that part of its orbit nearest the sun, and it is now showing the effect of these forces in the following ways: Its body is evidently becoming disintegrated and the fragments are seen to be streaming behind the comet in the form of a tail directed, not from but toward the sun. This mass of matter was measured by Mr. Barnard July 16th, and this measurement shows its least possible length is 4,300,000 miles and least possible diameter is 144,000 miles, so that the fragments which have already broken off from this comet fill a cubic contents of at least seventy thousand millions of millions of cubic miles. That is seven followed by 16 ciphers. The comet itself, which is 165,000,000 miles from the earth, is still fairly bright, and were it not for the fragments which are seen to follow it would seem to be in a perfectly normal condition. As it is, we know it must have lost an immense quantity of its original substance. This is an interesting case to astronomers, as it shows almost palpably the effect of the enormous forces to which every comet is subjected at the time of its perihelion passage, and the whole phenomenon forms an interesting commentary on the text that comets, even the stoutest of them, must be but short-lived things.

The reader of the above will, no doubt, be reminded of the fact that the comet, but recently known as Biela's comet, was recently seen to separate into two parts, which gradually receded from each other during two of its revolutions, when it finally appeared to become disintegrated, much as Barnard's comet is now being disintegrated, until it finally disappeared and has probably been lost to view forever.

THE WORLD'S DESERTS VANISHING.—The world is fast losing its deserts. There was a day when the United States had one of no small size, when it was claimed that all the land west of the Missouri river was a barren waste. The farmers of Kansas, Nebraska and Dakota have disposed of much of the great American desert. Once upon a time large portions of the interior of Africa were believed to be arid and uncultivable. Now we learn that they are fruitful and well populated. The interior of Australia has been held up as an awful example of a howling wilderness, destitute of water and of animal or vegetable life. That illusion is now being rapidly dispelled. Recent explorers report that inner Australia is no Saharan waste, and that though uninhabited it can support a large population. There are grassy plains, large lakes, and also traces of gold and precious stones. A north-and-south railway is now building through the center of Australia, and doubtless with its completion the last trace of the desert will vanish. The iron horse is a wonderful dispeller of illusions of that kind. The truth is that there are vast regions on this continent, in Asia and Australia which are barren from the standpoint of primitive and ignorant agriculture, but which, when taken in hand by the educated farmer of today, with his modern implements, blossom like the rose.—*Chicago Tribune.*

THE ADVANTAGES OF A DARK SKIN.—A scientist has discovered the advantage of a dark skin as a veil against the heat in hot climates. The carbon layer in the skin of the negro, being opaque, like other forms of carbon, must form an effectual veil, and thus protect that most important organ below the true skin; a bodily envelope or tissue presenting a vast surface of circulating blood, which is certainly subject to brilliant illumination when only protected from sunlight by the thin translucent cuticle.

Good Health.

Death From Trichinæ.

Joseph Palmi, a laborer, died at Bellevue hospital, New York, of that fortunately rare, but extremely painful, disease, trichiniasis. This disease may be described to the non-technical reader as the propagation and infinite multiplication of minute living worms in the muscles of the entire system. It usually arises from the incautious use of raw or partially cooked pork.

According to the New York *World*, he was at first supposed to be suffering from inflammatory rheumatism when brought to the hospital, but from the description of the approach of the symptoms, the resident physician decided that it must be trichiniasis. Palmi at first denied that he had been eating pork, but finally admitted that about a week before the pains appeared he had purchased some pig's feet of a butcher on Mulberry street, near his residence. His wife and children had eaten the food with him.

The man suffered terribly, and the physician was compelled to administer opiates, both internally and hypodermically, to ease the excruciating pain caused by the myriads of worms invading every muscle of his writhing body. Though the patient was able to take slight nourishment, he continued to grow weaker day after day, until death finally put an end to his sufferings.

Said Dr. Williams yesterday: "I have no doubt that the case is one of trichiniasis. Palmi must have eaten other kinds of pork, for pig's feet contain very little muscle, being principally composed of tendons, cartilage and gelatinous matter. His wife had a slight attack of abdominal spasms, which are the first symptoms of the disease. She, however, seems to have recovered, though I should not be surprised if the woman was brought here in the same state as her husband was. Trichiniasis consists of the breeding of minute worms in the muscles, and they go on multiplying until the entire system is filled with them. Being in the muscles of the pork, which has not been submitted to a heat of 255 degrees to kill the worms, they are taken into the stomach. Here they begin increasing and produce the abdominal spasms which are the initial symptoms; then, following the intestinal track, they finally pass through the abdominal walls, and so enter the lymphatic organs. From that moment the patient is doomed, unless he is so constituted that his system can resist the trichinæ when they become incysted and die. If they are too strong for resistance they go on living in the muscles until the latter decompose and death ensues very quickly.

"When Palmi was first brought here I took a piece of muscle from his forearm and discovered that he had previously suffered from the disease, because there were incysted worms visible in it. One of the symptoms is an intense thirst and agonizing pain, both of which were present in this case. Usually trichiniasis is developed from pork which is eaten raw, and people frequently have it who are in the habit of eating raw Westphalia hams and bologna sausage. But pork is not the only meat which is capable of developing trichinæ, for they are found in the muscles of dogs and cats, rats and mice, and even moles, all of which animals eat pork. The origin of trichinæ is unknown, and they may be inherited for all we know."—*Ex.*

The Ten Health Commandments.

1. Thou shalt have no other food than at meal-time.

2. Thou shalt not make unto thee any pies, or put into pastry the likeness of anything that is in the heavens above or in the waters under the earth. Thou shalt not fall to eating it, or trying to digest it. For the dyspepsia will be visited upon the children to the third and fourth generation of them that eat pie; and long life and vigor upon those that live prudently and keep the laws of health.

3. Remember thy bread to bake it well; for he will not be kept sound that eateth his bread as dough.

4. Thou shalt not indulge sorrow or borrow anxiety in vain.

5. Six days shalt thou wash and keep thyself clean, and the seventh thou shalt take a great bath, thou and thy son, and thy daughter, and thy man-servant, and thy maid-servant, and the stranger that is within thy gates. For in six days man sweats and gathers filth and bacteria enough for disease, wherefore the Lord has blessed the bathtub and hallowed it.

6. Remember thy sitting-room and bedchamber to keep them ventilated, that thy days may be long in the land which the Lord thy God giveth thee.

7. Thou shalt not eat hot biscuit.

8. Thou shalt not eat thy meat fried.

9. Thou shalt not swallow thy food unchewed, or highly spiced, or just before hard work, or just after it.

10. Thou shalt not keep late hours in thy neighbor's house, nor with thy neighbor's cards, nor his glass, nor anything that is his. —*New England Farmer.*

Another "Cure" for Insomnia.—Dr. Theodore B. Lyman recently wrote as follows: I think I have a very valuable discovery. For nearly two years I have been suffering greatly from sleeplessness at night, and frequently have not been able to sleep more than one or two hours during the night. A little more than a fortnight ago, while staying at the house of a friend, my good hostess brought into the parlor, quite late in the evening, a bountiful supply of freshly roasted peanuts. As I am very fond of them, when they are not too much cooked, I ate quite freely of them, and soon after retired to bed. I found the next morning that I had enjoyed the best sleep that I had experienced for over a month. I attributed this at once to the peanuts, and tried them again the following evening. I also drank a glass of fresh, sweet milk, after I had finished the peanuts. That night I slept still better, and, now, for a fortnight, I have partaken of the peanuts and milk every night, and not only have slept remarkably well, but have also fully recovered from a slight attack of indigestion. I now find that peanuts, carefully roasted and not overdone, so as to be at all burnt, are a sure remedy for sleeplessness, and also for that form of indigestion which produces sleeplessness.

Fatal Snake Bites.—The editor of the Savannah *Morning News* says: "Out of a thousand people bitten by rattlesnakes I do not think a dozen recover. There is no known cure, in spite of the fact that many people have said that they were cured by whisky. You may depend on it, that when a man says he was cured of a rattlesnake bite, though not necessarily a prevaricator, he is at least laboring under a misapprehension of the facts. There is a small snake similar to the rattlesnake in appearance, whose poison is not so venomous, and negroes bitten by it place lime upon the spot or else drink enough whisky to counteract the poison. Whisky, if taken in a large quantity, goes directly into the blood and counteracts the poison of the snake. But the regular Georgia rattler, from five to seven feet in length, is a deadly customer to meet. It does not give any warning, but strikes the moment it is disturbed, and it can strike an object as far distant as it is long. A friend of mine was riding along in the saddle one day, and a big rattler lying in the road leaped at him as he passed. It closed to his bootleg, driving one of its fangs clear through the thick leather of his boot and through his trousers, just escaping the flesh. It required considerable kicking to shake that snake off, and when he was finally got rid of he started in pursuit. My friend faced bullets in the army with nonchalance, but his hair stood on end when he saw that snake coming, and he jammed spurs to his nag and didn't stop until he had gone a quarter-stretch. My plantation is full of rattlesnakes, and only last week my hands killed 26 in a field of 20 acres."

A Fatal Kiss.—Mrs. Lena Rochler of New Haven died on Saturday, July 6th, of diphtheria, which she took from her little girl, who died of the same disease a week ago. The infection is attributed to her kissing the child, contrary to the orders of the physician.—*Boston Journal, July 10th.*

Useful Information.

Something About Fleas.

There are several varieties of the flea family. There is the human flea, the cat flea, the dog flea, the chicken flea and the pigeon flea. Each has a complete outfit of mandibles, lances, etc., which completely fits them for their conditions of life. It is said that most insects are entirely destitute of physical and mental powers, but this is certainly not true of the flea, otherwise abominable and disgusting as it may be.

Ordinary observation teaches us that the flea is possessed of most remarkable physical powers, extraordinary strength and agility—such in fact as enables them to make leaps of a thousand or fifteen hundred times their own length. If a man could perform a proportional leap, he would be able to scale a high mountain with only two or three bounds. In regard to mental powers, close observation has shown us that the flea possesses at least maternal affection in a very high degree. A writer on natural history says: "Fleas have a tender and provident affection for their young. Their eggs are frequently placed in the cracks of floors or in the crevices and corners of furniture, and almost always side by side with the eggs may be found small granulations which, when examined with the microscope, are seen to be specks of desiccated blood, so that the young flea when it enters into life will find its favorite provision ready for its use."

The flea, as everybody knows, is endowed from its very birth with a most voracious appetite, hence this first stock is soon exhausted. But the mother, if spared the human thumb, is closely on the watch, and at the proper time brings to her offspring the blood with which she has gorged herself from some other living creature and feeds it out much in the same way as pigeons give beakseful of food to their little ones.

The same author as above quoted, in consideration of these facts, exclaims: "Kind fleas! honorable fleas! Nothing less than this could have made me respect them. I make my bow, and out of respect for their good feelings I pardon them for the injuries they inflict on me."

From the above it may be charitably supposed that these degraded and despised insects are not half as bad as uninstructed people generally suppose them to be. They simply prey upon man and other animals as they prey upon each other.

> "So, naturalists observe, a flea
> Has smaller fleas that on him prey;
> And these have smaller still to bite 'em
> And so proceed *ad infinitum*."

"Limited" Corporations.

It has become somewhat common now-a-days to see the word "limited," in parenthesis, after the titles of corporations, and it is safe to say that people generally do not understand the significance of the term, though, of course, business men do. An explanation of it may, therefore, be of general interest. The old principle of corporations, created by legislative Act, was that the entire property of every stockholder was liable for the whole of the company, as the whole property of every member of a general partnership is still liable for the debts of the firm. This system made every shareholder responsible for bad management, of which he might not be guilty, and deterred wealthy men from becoming interested in the shares of corporations. To remove this objection the principle of limited responsibility was introduced, and in order to notify the public that only the separate property of the corporation was liable for the debts of the corporation, the English law requires that the word "limited" shall be used in every case by the company in connection with its title.

Most American corporations are constituted on the principle of limited liability; but few, if any, of the States enjoin the companies formed under their laws to append the word "limited" to their corporate titles. The matter is so generally understood in this country by business men, however, that it is not deemed necessary, though many companies do it of their own accord. The most noteworthy exception to the general rule is the case of the national bank, but even in this instance liability is limited to an amount equal to the par value of the shares held; that is, if the national bank fails, each stockholder may not only lose what he has invested, but $100 more for each share of the stock he holds, if so much is necessary to pay the debts of the bank.

Until within a few years all the Scottish banks were organized with unlimited liability, and when, some eight or ten years ago, a Glasgow bank failed disastrously, there were cases of men who only owned a share or two, valued before the failure at not much more than $100, who were assessed thousands of pounds sterling to meet the debts of the bank. Since that time the Scottish banks have been allowed to reorganize on a limited liability basis.—*Ex.*

How Creosote Affects Chimney Flues.—Attention has more than once been called to the peculiarly corrosive, and consequently destructive, effects of the creosote of wood soot upon chimneys, owing to the fact that the creosote thus formed from the slow combustion of wood contains so large a proportion of pyroligneous vinegar or crude acetic acid; this acid being formed in large quantities when the combustion of wood is slow, many quarts, in fact, being condensed in cold weather where a large wood fire is very much checked, only a few hours being required for such condensation. The acid in question dissolves lime readily, carrying it away in solution, and in this manner the mortar is frequently entirely removed from the tops of chimneys in the country, new ones suffering in the same way as the old, instances being numerous where the top courses of bricks in chimneys only two years old have become entirely without support other than that afforded by the sand with which the lime was mixed.—*Am. Gas Light Journal.*

Terra-Cotta Works at Vallejo.—Terra-cotta and brick works have recently been established at Vallejo. The works are not complete in all the departments, but, says an exchange, the work of making the "clay shale" into building material is progressing nicely. Only two machines are working at present, the other four being in course of construction, and as soon as they are ready for operation the force of workmen will be increased. Tons of the selected "clay shale" has been gathered, and is being broken up to the required size for the crusher. In a test recently the brick stood a pressure of 16,500 pounds, and only resulted in chipping the corners, and this would not have happened had the machine been perfect. With the two machines running 50 men find employment. The making of terra-cotta has not been started on yet, the chief aim being to fill orders for building and ornamental brick.

Silk Direct from the Mulberry Leaf.—One reads and hears of a great many wonderful inventions now-a-days, and consequently is not much surprised at anything, but it is doubtful if anybody can be found who will take the following statement without some allowances: "It is reported that a process has been invented for extracting silk fiber from the mulberry leaf without the intervention of the silkworm. The quality of the silk obtained is declared to be equal to the best silkworm product. It is an American invention, and if successful, as is anticipated, will work a revolution in the production of silk."

A New Dog from Holland has a long mane, a short body, a sharp bark, a head like a pig, big ears and no tail. He has appeared at English dog shows, and is fashionable and expensive.

Electricity.

Electro-Therapeutic Spectacles.

The application of electricity is getting to be more and more recognized as beneficial, and electric apparatus of various kinds have been developed and find large sale. The latest invention in this line, and one that seems to be of great benefit, is the application of electricity through the medium of a pair of spectacles. The device is particularly applicable and advantageous in cases of nervous headache, etc.

The frame of the spectacles may be of the usual construction, except that it is preferably made of copper. The arms of the spectacles, at a point somewhat forward of the ears, are formed with vertical open enlargements, somewhat oval in outline. Within these openings are inserted corresponding zinc plates, which, when the spectacles are in position, come in contact with the face rearward from the eyes. Another delicate strip of zinc is attached under the bridge-piece so as to rest upon the nose. The copper spectacle frame may be protected against oxidation by means of a coating of lacquer, varnish, or other suitable composition, applied at any suitable points, as desired.

The operation and advantages of this invention will be readily understood by those skilled in the art to which it appertains. In use, the copper framework of the spectacles and the zinc plates at the ends of the side arms and at the nose-piece will come in contact with the face and head of the wearer, and, owing to the location of the plates at opposite sides of the head, and the relative location of the strip upon the nose-piece, the current of electricity generated by the device in the usual manner will be caused to pass through the head of the wearer.

This invention is particularly valuable, as the spectacles, while performing their usual office, will at the same time be removing the pain in the head and preventing its attack. This is a German invention. The agent in this country is Mr. Alfred Brost of Key West, Fla.

The Future of Electricity.

Thos. A. Edison said in an interview with a reporter of the Pittsburg *Dispatch:*

"You ask me about the future of electricity. It is the coming motive-power. It will be used on all the railroads some day, but the point is to get an economical engine. My theory is to have immense dynamos located all along the line of the road, and have the electricity conveyed from these stationary engines to the locomotives by wires through the rails. For example, I would put two big engines between New York and Philadelphia, and enough power could be furnished to whisk the limited at the rate of 100 miles per hour.

"But this is the point I have been working on for years—to convert heat directly into electricity without the intervention of boilers, steam and all that. What an enormous amount of expense could be saved if this could be done. Think of putting something into the heat of that natural gas fire and making electricity out of it! It can be done. I feel it in my bones, and just now I have a suspicion that I am on the right track, but it is a pesky problem—one that can be worked out only in time.

"I have been experimenting with an electric road in New Jersey. I had rails laid as they put them down on railroads, but the machine would run off the track in going around the curves. I then raised the curve to an angle of 40 degrees and the motor went around all right. It looked as if the engine would topple over, but it didn't. You know in a centrifugal machine you can make a car go clear around a circle in the air without leaving the track."

Cost of Storage-Battery Power.—The following figures are given out by the Julien Electric Traction Co. as actual results attained on the Fourth-avenue surface road, New York City, in running cars with storage batteries. A car can run in actual work 57½ miles without recharging. During 40 days that the car in question had been at work neither batteries nor motors have required attention or expense for repair or renewals. The batteries of one car that had been running since Sept. 3, 1888, were examined on the 8th ult. for the first time, and are stated to be in as good condition as when put in. The cost of motive-power is calculated at $3.10 per car per day of 60 miles. This is the cost of energy at two cents per horse-power, at which it is offered to be supplied by the electric companies, and $700 per annum for maintenance of batteries and motor.

Electrical Transmission of Power.—A large cotton-mill company, located at Manchester, N. H., is going to utilize the transmission of power by electricity as an economical movement. The corporation will use water-power, which they control, which is about one mile from the mill, and which they have been unable to use heretofore. The machinery is so constructed and operated as to light the works as well as to drive them.

The City of Berlin is far ahead of London in telephonic progress, there being 10,000 subscribers. The entire net of wires in the German capital has reached a length of 17,804 kilometers, and the average number of calls amount to 196,691 daily.

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SAN FRANCISCO
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Business Announcements.

[NEW THIS ISSUE.]

Steam Pumps—Risdon Iron Works.
Books—National Pub. & Printing Co., Milwaukee, Wis.
Fire-Proof Paint—C. A. Scoville & Co., Oakland.

See Advertising Columns.

Passing Events.

The conflagration at Spokane Falls is the third within a few months in Washington Territory. Seattle, Ellensburg and Spokane Falls have all had most disastrous fires. The last one caused a loss of about $10,000,000. All the business houses, banks, hotels, depots, etc., were destroyed. The water pressure (on the Holly system) was very weak.

As was recently indicated in the PRESS, the United States Court at Carson has confirmed the sale of the Sutro Tunnel property for the sum of $1,325,000 to the Union Trust Company of New York. The sale was made on January 14th, and was made to satisfy a mortgage held by the late Hugh McCalmont, as trustee for English capitalists. The transfer of the property, it is said, will not result in any change in the present management of the tunnel property.

The medical and scientific world is just now greatly interested in Dr. Brown-Sequard's alleged discovery which he calls "elixir of life," by which the reddish fluid obtained from the tissue of sheep is injected into the veins of human beings with the effect of rejuvenation. The subject is being vigorously discussed, some believing it and others totally discrediting the whole story.

The rivers and streams of this State and Nevada are now at a very low stage. Most of the snow on the high Sierras has melted.

There is great dissatisfaction among lead miners over the inaction of the Treasury Department on the subject of duty on silver-lead ores. So much lead is coming in free of duty that it is depressing the home lead industry.

Another Phase of the Silver Question.

The more the conservative but close student of political economy examines into bi-metalism, the more fully must he be convinced that the United States made a serious mistake when it joined in the knightly crusade against silver. As shown in our editorial on the influence of silver on American wheat, the depreciation in the price of that metal since this country in 1873 demonetized it has been over 36 cents an ounce, which has carried the price of American wheat on a gold basis, within the like time, down about 40 per cent. The attitude of the United States toward silver has undoubtedly done more than all else to destroy confidence in its rehabiliment as a metallic currency. This country produces single-handed nearly one-half of the world's annual product of silver, and the fact of its taking action against the metal was sufficient to throw consternation into the camp of its friends. But then this is not all; the United States have great interests at stake in maintaining the value of silver and should not play into the hands of England by aiding in its depreciation. These interests lie in the value of the farm produce we export, which exceeds the value of the produce exports of any three nations. With these well-established facts ever uppermost, can we reasonably expect other nations to take the lead in remonetizing silver when we remain dormant with so great interests at stake? Germany's hatred of France will undoubtedly cause its rulers to make haste slowly in any move looking to the restoration of silver as a metallic currency, while England's interests lie in the direction of keeping down the price of silver. The more silver falls, the sooner will her plan for increasing the exports of wheat and cotton from India be consummated, to the great detriment of those interests in the United States. By undermining through low prices two of the leading farm industries of this country and also one of our leading mining industries, England keeps us from making far more rapid strides in which we would with these leading interests promoted by better prices; and yet our so-called statesmen are so blinded by the allurements of English logic that they do not appear to realize the true situation. If there was anything else wanting to convince the most skeptical of England's fear of this country being its rival, both financially and commercially, it is the fact that her statesmen are doing all in their power to build up Canada, which looms up along our side, by giving it subsidized steam and railroad facilities to win trade that naturally belongs to the United States. That this is no idle fear is shown by England gradually acquiring a firmer hold in the Pacific by annexing small but at present unimportant islands, which in the future can be utilized as coaling stations, or for other purposes as occasion arises.

England's rivalry is not that which is indicative of war, but that of retaining her supremacy in commerce; for in the United States the English statesman sees a rival, which, if not counteracted or forestalled, will win success through that sheer force of Yankee perseverance and undaunted will-power when once aroused to a true realization of the situation.

THE Grass Valley *Union* says: "The snow is all gone from the higher ranges of the Sierras, so that the prospects are that the rivers will yet go lower, and if navigation should fail in the Sacramento itself it will not be surprising. No rise in the streams can be looked for before October."

THE men at the Eureka foundry went on a strike last Saturday night, on account of a difficulty between the molders and the foreman. The latter, Chas. D. Greene, has resigned.

A SAWMILL is being put up at Tableta valley, 20 miles from the Alamo mining camp, Lower California, in the midst of a body of 16,000 acres of pine.

THE National Electric Light Association has adopted a resolution requesting the State of New York to repeal the Electric Execution law.

Jacob Price's Patents.

A Good Record of Important Inventions.

Jacob Price, the San Leandro manufacturer of baling presses, has devised and perfected many important inventions since he first commenced work in his special line. The vertical press, known as the Petaluma hay press, was patented as far back as Sept. 1, 1863. The first improvement devised by him was in the shape of the upper part of the press-box, which was narrowed by the inward inclination of the sides, the object being to discharge the bale readily. He also improved the catches for fastening the doors of the press-box, open or shut, and the arrangement of the levers, chains and pulleys for bringing a gradually cumulative strain on the follower as it approached the end of the stroke.

November 28, 1865, he patented a crushing and baling machine in which a reciprocating motion is imparted to the baling-chamber for the purpose of holding and pressing the sheets of material, the same being crushed by the rollers by means of racks, pinions and other mechanisms connected therewith. Loose rollers are employed for folding and compressing the material after it has passed into the baling-chamber, together with grooves in the peripheries of said rollers, through which the strings, wires, etc., may be placed in binding the bale.

On June 6, 1876, he patented an upright baling press in which he greatly simplified the working or movable parts so they could be quickly operated, and yet provided substantial devices for withstanding wear and tear.

His patent of June 11, 1878, provided a machine for baling hay in which the hay or straw can be fed continuously into one end of the machine, compressed into one single continuous bale as it passes through, and cut off into proper-sized bales at the opposite end, thus forming a continuously operating hay press.

On September 14, 1880, he patented an improvement on a hay baler whereby the hay is pressed into bale in layers by the action of a reciprocating follower operating against a solid fixed head. The patent covered the construction of the parts and certain novel combinations and arrangements.

In the upright press patented July 22, 1884, the bale is formed in a chamber at the top by a succession of charges which enter through an inclined feed-throat or hopper at the bottom of the press, into which the material to be baled is pressed and the hopper closed after each charge is received until it has been forced into the baling chamber by a vertically moving follower. This patent also covers a mechanism for operating the follower, an eccentric of variable power by which the mechanism is operated, retainers by which each charge is held in place while the follower descends for a new charge, and the means by which the horse-power lever may be disconnected from the mechanism by which the follower is moved, so that the latter may descend without stopping the horse or changing the direction of his movement.

The horizontal, double-ended press was patented Dec. 18, 1888. In this the bales are discharged from both ends alternately. This modern press is light, strong and fast. There is a peculiar mechanism by which the follower is given a comparatively rapid speed at the commencement, and the speed becomes slower and the power greater as more compression is needed. The press is now made of steel, and is a great improvement on the old styles.

Mr. Price patented on March 22, 1870, an improvement in gang plows, and Jan. 14, 1879, patented a sulky plow. In the latter the axle has one fixed crank and rigid lever. At the other end is a loose spur-wheel; also, a loose crank, on which revolves a spindle having a pinion engaging a spur-wheel. By a foot lever a brake secures the spur-wheel, when the pinion must travel around it, thus raising the plows by the onward movement of the sulky. The crank-axle and plows may also be raised and locked by the hand lever. The difference in the two cranks levels the frame when one wheel is in the furrow or both on land.

Mr. Price has invented two "carts," the first of which he patented Oct. 16, 1883. In this village cart the improvement consists of a novel construction of the body of the vehicle, and as a means for leveling the same to suit the hight of animals of different sizes which may be used. The second one was patented April 29, 1884. It consists of a frame, the side pieces of which are formed of continuous bars of flanged or angle iron, with lugs for the attachment of the seat or other parts and curved strengthening ribs at the points where bends are made.

Among miscellaneous inventions by Mr. Price is a broadcast sower, patented by himself and others Jan. 3, 1872. This is the combination of a hopper and the seeding mechanism of a broadcast sower with certain levers arranged within reach of the driver, to govern the flow of grain and the operation of the machine. Another seed sower was patented by him May 5, 1885. This patent covered details relating to the regulation of the feed to the base frame of the machine and the manner of its attachment to the wagon and to the gearing devices by which power is transmitted from the wagon to the elevator and distributor. This machine did good work both with regard to the extent of the work in a given time and to its quality with respect to an even distribution.

His excavator and dumping-cart was patented Oct. 17, 1876. It was an improvement on that class of excavating machines on which a number of buckets are formed on the periphery of one of the bearing wheels of a cart, so that the earth which is turned and deposited in the buckets by a plow attachment below the cart body will be lifted into the cart until it is filled. The improvements made the appliance more convenient, effective and ready to operate.

On May 31, 1887, Mr. Price patented his traction engine for use on ordinary roadways or fields. It consists of an engine and boiler mounted on suitable bearings and traction wheels, and an intermittently-oscillating clutch mechanism of peculiar construction by which the reciprocating motion of the engine is transmitted to the driving-wheels, so as to produce a continuous rotary motion of the same without the intervention of gearing; and it also consists in a means for adjusting the transmitted stroke and the consequent power which is applied to drive the engine. The patent also covered many details of construction of the various parts of a road engine.

We have not attempted to give any special details of these patented appliances, but this mere mention of 15 patents taken out since 1860 shows a pretty good record for one California inventor, who is still actively at work.

BULWER CONSOLIDATED SUIT.—From the official statement of the Board of Directors of the Bulwer Consolidated Mining Company regarding the suits between that company and the Standard Consolidated Mining Co., we learn that the former company was confirmed in its title to its several mining locations, viz., Stonewall, Homestake, Ralston No. 1 and Ralston No. 2. From this judgment the Standard Co. has taken an appeal. In the other suit the latter company sued the Bulwer Co. for $20,000 damages, and obtained a verdict in its favor for $3000. The damage suit was grounded on an averment that the Bulwer Co. had extracted ore from the west branch of the West Bullion vein, and also that the company had maliciously and wantonly entered upon and within the limits of its West Bullion location and had blown up and destroyed certain bulkheads and chutes therein. An application for a new trial has been made by the Bulwer Company.

DUTY ON MATTE.—The Treasury Department has modified its ruling in regard to the proper rate of duty on copper contained in the so-called nickel matte so as to provide that the fine copper contained in nickel matte shall be assessed for duty at the rate of 3½ cents per pound under the tariff provision for regulus of copper, in addition to the duty of 15 cents per pound on the nickel contained therein imposed by T. I. 191. The decision was modified upon representations that matte is not an ore, and that matte and regulus of copper are synonymous terms.

IT is stated that the powder companies of this city are about perfecting a pool, by which prices will be advanced.

THE people of St. Helena subscribed $2000 for rebuilding the foundry that was burned down last Friday.

THE output of coal from the Vancouver mine, British Columbia, in July, was 19,000 tons.

Quicksilver Condensers.

In last week's PRESS we gave illustrations of the glass condensers in use at the New Almaden mines. The complete condensation of mercurial fumes in a large way presents many practical difficulties. The quicksilver fumes furnish often less than one per cent, by volume, of the products of combustion with which they are mixed. Even the weight of the quicksilver is inconsiderable, compared with that of the gases which pass through the condensers. The plan, sections and elevation of two condensers in use at New Almaden are shown in Figs. 1, 2 and 3 of the cuts. It will be seen that each condenser is a tall, narrow structure, divided by a vertical partition-wall into two compartments. The fumes enter the condenser near the top, pass down the compartment on that side, and out through the arched passages at the bottom of the partition-wall into the other compartment, up which they pass to be discharged into the next one of the series.

The tops of the condensers are sometimes made of cast-iron plates, which are used as drying floors for damp *tierras;* in other cases they are topped over with arches of brick. The floors as shown in section *CD*, Fig. 2, have a slope of 10° from the center to either end, so as to shed the condensed metal to the drain gutters. The floors are brick, closely laid in the most careful manner, then a layer of cement. A heavy coat of asphalt is laid on this in all but the hottest condensers. Manholes, two feet square, are left in the end-walls near the floor of the condensers, so that they may be cleaned at intervals.

These brick condensers are arranged in a series so that they stand side by side, with an air space between each pair; the ends of all being in the same planes. The drain gutters pass the whole length of the series on both sides, and receive all the quicksilver that flows from the ends of the condensers.

An improved form of brick condenser and drying chamber for *tierras* is shown in Figs. 4, 5, and 6. This forms a part of the condensing system of No. 3 furnace. Here the drying-chamber is provided with shelves, resting on iron crossbars. The tierras lie upon the shelves much as they do in the roasting furnaces. The method of drawing and discharging the ore is evident from the figure. The hot fumes from the furnace pass all around these drying-chambers, thus heating their contents. The steam generated from the moisture in the ore is allowed to escape to the open air through flues built in the hollow wall of the drying-chamber.

The leakage of quicksilver fumes through the walls of the brick condensers and the permeation of the foundations by the liquid metal are practically overcome by the care taken in constructing these new condensers. The condensers are always underdrained, and inclined iron plates, protected by coal tar, are placed in the foundations. On the other hand, brick condensers can not be regarded as very effective cooling agents. The brick is among the worst conductors of heat, and it is found unsafe to build the walls thinner than nine inches. Besides, the mortar is slowly attacked by the acid fumes, gypsum and other sulphates being formed.

In spite of the numerous disadvantages of brick condensers (says Mr. S. B. Christy in his paper, from which we take these facts), nothing has yet been found to replace them as sedimentation chambers, and when they receive hot fumes still above the dew point, they suffer very little from corrosion.

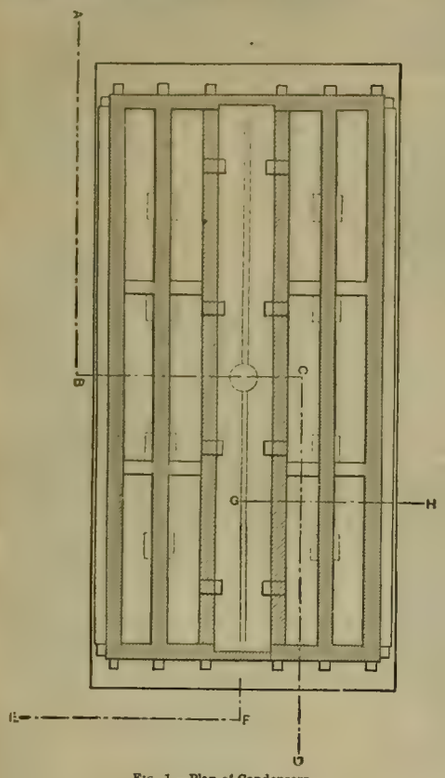


FIG. 1.—Plan of Condensers.

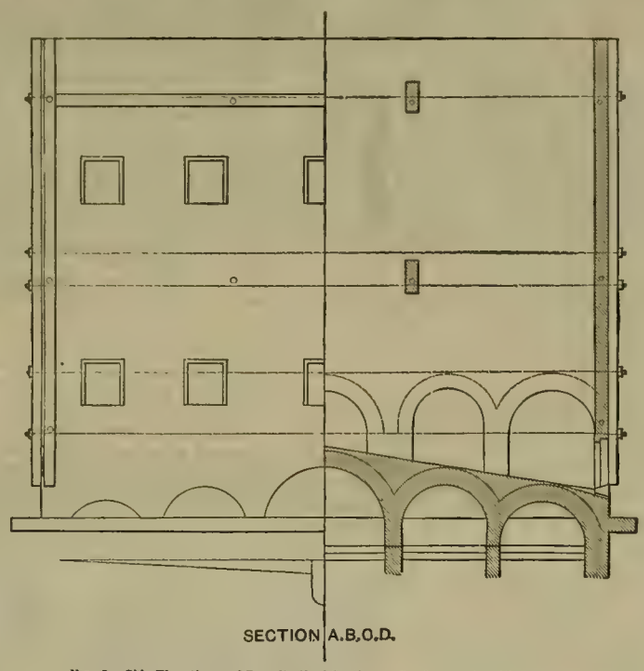


FIG. 2.—Side Elevation and Longitudinal Section Condensers (see Fig. 1).

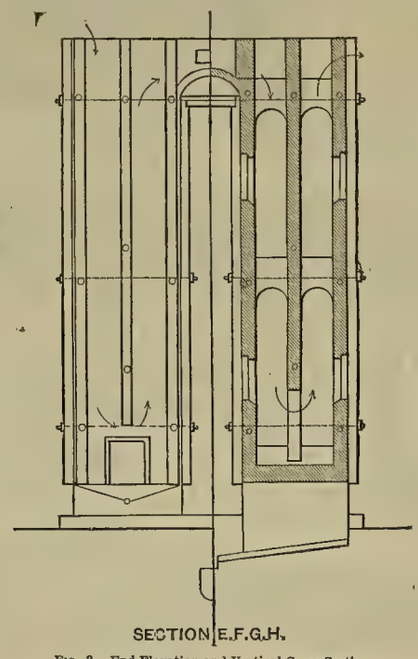


FIG. 3.—End Elevation and Vertical Cross-Section.

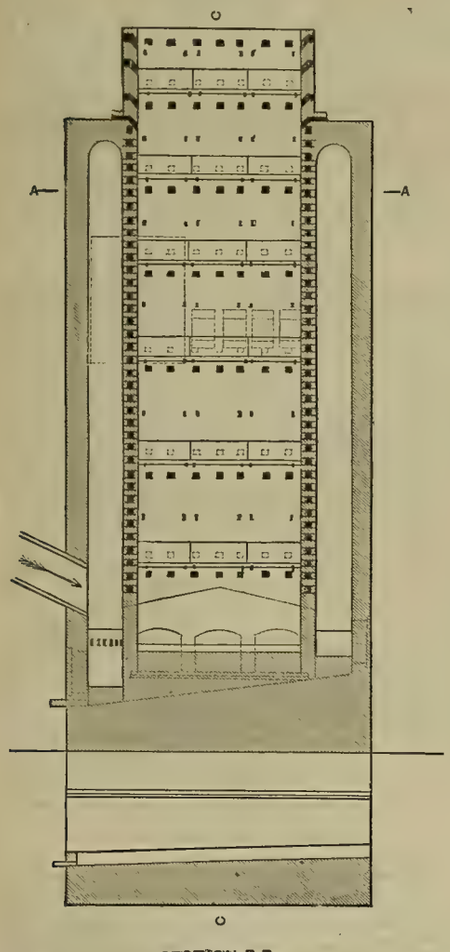


FIG. 5.—Condenser and Drying-Chamber see Figs. 4 and 6).

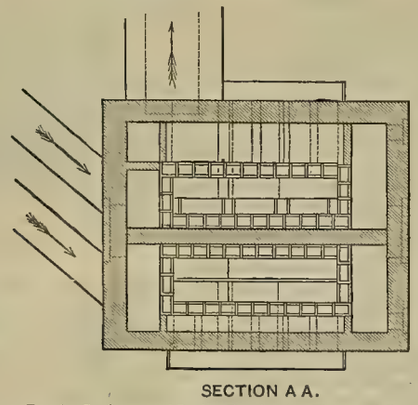


FIG. 4.—Condenser and Drying-Chamber (see Figs. 5 and 6).

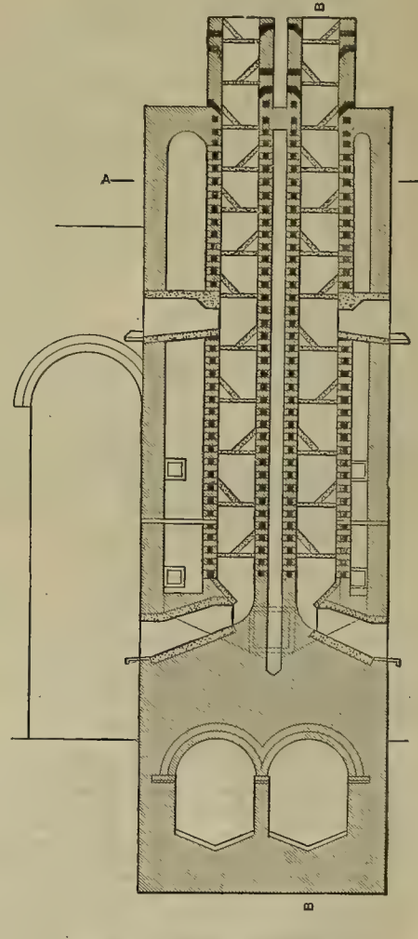


FIG. 6.—Condenser and Drying-Chamber (see Figs. 4 and 5).

QUICKSILVER CONDENSERS AND DRYING-CHAMBERS AT NEW ALMADEN MINES.

OVER 55 coke plants, comprising 9000 ovens, are now idle in Pennsylvania. In the Connellsville coke region the force of strikers has increased to 10,000 men.

JOHN EDWARDS was instantly killed Tuesday afternoon by falling 200 feet in the Washington mine at Ormonde, Nevada county.

Assay of Coal.

Those who are prospecting for coal often have difficulty in determining to what class their finds belong. The principal varieties of coal are as follows:

Anthracite or Hard Coal—Hardness, 2–2.5; specific gravity=1.32–1.70. Contains volatile matter after drying 3 to 6 per cent. Contains carbon 80 to 95 per cent. It has a high luster and burns without flame, as it contains little or no bitumen. It is totally devoid of impressions of plants, and is, geologically speaking, the oldest of all kinds of fossil charcoal, and is regarded as the last stage of carbonization. It yields from 1 to 7 per cent of ash, but 3 per cent may be called the average.

Brown coal, or lignite, much of which is found in California, contains from 57 to 70 per cent of carbon, and represents the first stage of carbonization, being a coal of comparatively recent formation. It is composed of fossil plants more or less mineralized, and when burnt evolves much smoke and affords a dull flame, generally yielding a large quantity of ash. It contains from 2 to 19 per cent ash.

Caking coal is a bituminous coal which softens and becomes pasty in the fire, and after the heat has become continued for a time, the volatile ingredients are driven off and a grayish-black fretted mass is left. The coke obtained from this coal varies from 50 to 85 per cent.

Non-caking coal resembles the above in its external character, but burns freely without softening or showing any appearance of incipient fusion.

Cannel coal is a bituminous coal which generally cakes. It is compact with little or no luster, and has a dull black or grayish-black color. On distillation it affords, after drying, 40 to 66 per cent of volatile matter. When held in the flame of a candle, it easily ignites, burning with a steady, bright flame. It is used extensively for making illuminating gas, of which it affords a better quality than any other species of coal.

It is well to know that no very extensive apparatus is required to determine many points about coal. It can be examined and its commercial properties determined by the blowpipe with great accuracy. Mr. George Attwood (eldest son of Melville Attwood of this city), in his work on "Practical Blowpipe Assaying," gives the following methods of determining the character and properties of coal, by means of the blowpipe:

The assay is divided into five heads:

1st. The moisture determination.

Select from the mass of coal to be examined a few lumps representing as nearly as possible the average quality. Crush them up in the agate mortar into small pieces about the size of a mustard seed.

Weigh out five grains, place in a small porcelain dish, and dry at a gentle heat over the spirit-lamp. Hard coals sometimes fly when heated, so it is best to cover the dish with a watch glass while heating. After about five minutes, remove the assay and weigh; then repeat the heating and again weigh. As soon as the weights agree the assay is ready to be converted into coke. Plattner states that the percentage of moisture is lowest in anthracite; in bituminous coals it is usually three to four per cent, seldom six to seven, and reaches its maximum in lignite and brown coals, which contain 20 per cent and sometimes more.

2d. Determination of the coke production.

Take the dried coal and remove to a clay or platinum crucible, and cover with a small roasting clay dish or platinum cup. Place the crucible on a triangle of platinum wire on the blowpipe stand under the flame, using alcohol, and cover it with a small sheet-iron funnel (the same that is used in roasting copper ores). The heat is continued until all the volatile gas has escaped, when the assay generally will appear to possess a fused porous appearance, and to have a metallic luster.

The coke so made is now removed and weighed. It should be weighed quickly, as coke absorbs moisture from the air rapidly. The coking takes about 10 minutes, and the crucible should not be allowed to get beyond a red heat.

3d. The estimation of the amount of ash.

After the percentage of coke has been determined, remove the assay to a small clay or platinum capsule, and, without using a cover, again heat over the lamp—this time to a bright red color—until all the carbon has been consumed. The operation is much facilitated by occasional stirring the assay with a piece of platinum wire, also by applying the blowpipe flame to the bottom of the cup when the assay is nearly finished.

If alcohol cannot be obtained, the assay for coke and ash can be conducted in the charcoal furnace by using the blowpipe flame, as in the copper assay, and if the ash amounts to more than five per cent, the value of the coal is much diminished. If the ash presents a brown, red, or gray color, sesquioxide of iron has been formed by the oxidation of the pyrites in the coal.

4th. Determination of the absolute heating-power by Berthier's process.

Take an average sample of the coal and crush it up to the finest powder. Weigh out 0 3 grain of the coal dust and mix it with 12 grains of oxychloride of lead, and after placing the mixture in the crucible, cover it with an additional 12 grains of oxychloride of lead.

Oxychloride of lead fuses more readily than litharge; therefore, owing to the large quantity of material which must be brought into a state of fusion in this determination, it is employed instead of litharge.

The assay is next covered with a little powdered glass, also with a few spoonfuls of borax glass. A clay cup is placed over the crucible, and the assay is then fused in the charcoal furnace in a similar manner to the silver assay when litharge is used.

About seven or eight minutes suffices to melt the assay, and the lead button produced by the carbon in the coal acting on the lead oxychloride will be found lying upon the bottom of the crucible when the assay is cool and the crucible is broken.

The weight of the button, when cleaned from the slag, divided by 20, gives the quantity of lead that one part of the fuel under examination can reduce; and since one part of carbon reduces 34 parts of lead, the heating-power of the fuel may be easily ascertained. The amount of lead reduced by one part of coal varies with the different pit coals between 21 and 32 parts, with the lignites between 16 and 25 parts. In making this assay the heat must be applied at first very gradually, and afterward increased to a bright redness.

Dr. Ure's experiments, published in the "Supplement to the Dictionary of Arts, Mines, and Manufactures," have appeared to be unsatisfactory in regard to the accuracy of Berthier's method. Mitchell, however, has found the method correct, and the author has found it equally so. The lead oxychloride should always be pure.

5th. Estimation of sulphur in a sample of coal.

Sulphur generally exists in coal as a sulphide of iron, and as the presence of more than two per cent of sulphur depreciates the market value of coal, owing to its destroying the iron boilers and grates under and over which the coal is consumed, it is always an important part of the examination of coal to ascertain the quantity present.

Mitchell, in his "Manual of Practical Assaying," recommends the following process:

Take one part of the finely pulverized coal and mix with seven to eight parts of niter, and 16 parts of common salt, and four parts of carbonate of potash, all of which must be perfectly pure. The mixture is then placed in a platinum crucible and gently heated at a certain temperature; the whole ignites and burns quietly. The heat is then increased until the mass is fused; the operation is finished when the mass is white. It must, when cold, be dissolved in water, the solution slightly acidulated by means of hydrochloric acid, and chloride of barium added to it as long as a white precipitate forms. This precipitate is sulphate of baryta, which must be collected on a filter, washed, dried, ignited, the filter burnt away, and the remaining sulphate of baryta weighed; every 116 parts of it indicate 16 of sulphur.

The above described methods of examining coal are all that are required for commercial purposes. The assay may be carried on still further by estimating the iron oxide contained in the ash. The ash can also be examined qualitatively for silica, lime, soda and potash.

Postage on Books.

Congress will probably be asked, at the coming session, to include books among domestic mail-matter of the second class—in other words, to make the rate of postage on books, sent in the mails, the same as that now charged on periodicals.

Edward Everett Hale points out, in a recent paper, that no reason now exists for the discrimination against books by the Postoffice Department. He says that periodicals were long ago placed at a rate which is only one-quarter of that exacted for books, in order that the people might be educated in matters of government. The distinction still exists, although the periodical is often heavier and more cumbrous than the book. But a copy of "Scribner's Magazine" will be sent by the United States to an outlying postoffice in Washington Territory at a quarter part of the price which a book of the same weight and the same size will be sent for. The result in the publishing of the country is exactly the same which might be seen if a great shoe dealer were "boycotted" by all the express companies. If the express companies said they would carry Jones & Co.'s shoes for a quarter part of the price for which they would carry Smith & Co.'s shoes, they would say just what the General Government says when it carries the magazine weighing eight ounces for a quarter part of the price of a book weighing eight ounces.

FISH in the Sacramento are being destroyed by thousands by the dumping of sawdust from a new mill recently erected about ten miles this side of Sissons.

Mining Personals.

J. H. Knuthson is secretary of the Young America mine, Sierra county.

P. P. Black is superintendent of the Knownothing mine, Trinity county.

M. L. Elliott is superintendent of the Keystone Con. mine, Amador county.

James McQuarrie is foreman of the Pacific mine, at Pinos Altos, New Mexico.

N. L. Bell, superintendent of the Peck and Occident mines, is in Prescott, A. T.

Philip Oates is superintendent of the San Carlos copper mines on the Gila river.

August Dannenbrink is superintending the Gold Run mine, Knownothing creek, Trinity county.

O. M. Loveridge is superintendent of the Trinity gold mine, on Oregon Gulch mountain, Trinity county.

Supt. Lapham is well pleased with the work done on the Aztec Mill, New Mexico, by Chas. Wilkie, the millwright.

Marcus Daly, the well-known Montana miner, has recently been examining the mines of Red Lodge district, in that Territory.

James Sutherland is superintendent of the Niagara mine, recently sold by W. T. Coleman to an English syndicate for $200,000.

The U. S. Debris Commissioners, while at Smartsville the other day, were "piloted" about by N. C. Miller of French Corral.

Mr. Joseph L. McNally of San Francisco is at present principal assayer for the celebrated Maginnis Mining Co., Maiden, Montana.

Mr. Omsly, one of the owners, is to superintend the Primrose mine, Hog Canyon, Sierra county. The mine will soon be started up.

A. S. Denaugh has charge of constructing the addition to the concentrating-mill of the Emma and Last Chance Co., Milo Gulch, Cœur d'Alene.

L. L. Myers, formerly a hydraulic mining man of this State, is in charge of gravel mines near Poto, Peru. The mines are at an elevation of 11,450 feet.

James B. Haggin sailed from New York for Europe last Saturday. He won the suit against the French Copper Trust for $200,000, and has gone to collect the money.

Mr. W. A. Clark made a very telling and important speech on the subject of "Taxation of Mines" in the Constitutional Convention of Montana. It seems strange that in that section it is necessary for some one to defend the mining interest.

A. D. Weske, the well-known mining man who has been operating for some time on the Forest Hill divide, Placer county, has bonded the George Squires drift mine, located near Alta, for one year, and will put on a sufficient force to thoroughly prospect it.

Few deputy U. S. mineral surveyors are better known in this State than Chas. Hendel, whose "stamping ground" is in Sierra and Plumas counties. And there are few of them who have tramped more miles of mountain country than he. The *Mt. Messenger* says, however, that "having amassed wealth, he now travels in a buggy."

The work of overhauling and repairing the pump and shaft of the Pioche Cons. M. Co., at Pioche, Nev., has been carried on under the direction of E. A. Shear, who has had large experience in such matters, and who came from Park City, Utah, for the purpose. A paragraph in our "Mining Summary," on another page of the PRESS, describes the work done.

Philip Deidesheimer is general manager, and L. Foss superintendent of the Young America mine, Sierra county, which has recently been bonded by Geo. M. Pinney and others. The mine is on the mountain-side, above Upper Sardine lake, and back of the great Sierra Butte. The mill is on the bank of Lower Sardine lake, and is run by a Pelton wheel, with water from the upper lake. The same water is again used by the Yuba mill of the Sierra Buttes mine, which is down on the river bank.

The Inyo *Independent* says that it is due to two men that the Cerro Gordo mines in that county have been sold. Thos. C. Boland and J. S. Gorman ventured their money in the mines when nobody else would do it, and it is owing to their courage and energy that the mines were got into such condition that capitalists were willing to buy them. The change of ownership will result in a revival of mining industry all over the county; but for this revival Boland and Gorman are the first to deserve thanks.

"Darling Delinquent."

A country editor discourses, under the above heading, in a manner which almost every editor and publisher can appreciate, as follows:

Dear, darling delinquent! Our precious subscriber in arrears, do you think we have sold out and gone west to mingle with the grasshoppers? No, no, little sugar plum, we could not get away if we wanted to. We are still at the old stand dishing out the *Democrat*, sweet promises and bright expectations. They make an excellent diet, darling, with a little encouragement, to serve as dessert. We are waiting for thee, turtle dove. We long to hear the sound of thy footsteps on the stairs and the silvery ring of thy voice within our lonely sanctum. Dear one, we feel unusually sad and lonely without thee to-day. We sigh for one glance of your eye and even half you owe us. Don't see how we can possibly live happy without you, dear. Now, little pie crust, will you come? Do we hear your answer in a voice so sweet and beguiling, "I am coming," or is it only the wailing winds that round our sanctum roar? We pause for further developments.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific States.

From the official report of U. S. Patents in DEWEY & CO.'s Patent Office Library, 220 Market St., S. F.

FOR WEEK ENDING JULY 30, 1889.

407,947.—SAFETY CATCH FOR CARS OF INCLINED RAILWAYS—W. C. D. Body, Grass Valley, Cal.

407,922.—PIPE COUPLING—W. M. Brown, Jr., Sacramento, Cal.

407,771.—TOOL FOR CUTTING OUT BOILER TUBES—John Comer, Redding, Cal.

407,964.—PAPER BOX—H. Roensch, S. F.

407,965.—FRUIT PITTER—Jno. Rosassco, Healdsburg, Cal.

408,149.—HYDRAULIC ELEVATOR—W. F. Toothaker, S. F.

The following brief list by telegraph, for Aug. 8th, will appear more complete on receipt of mail advices.

Arizona—August H. Elfers, Phœnix, water elevator; James Pringle, assignor of half an interest to R. Bowen, Silver King, hose coupling.

Oregon—Charles Hay, Portland, supply and water cock; Horatio F. Hicks, Ashland, oar; Lafayette W. Longhary, Monmouth, gate.

California—Henry C. Beatty, Sacramento, steam motor for pump; Charles H. Ensign, Temescal, and H. B. Wright, Berkeley, packing for stuffing-boxes; Edwin H. Fowler, National City, removing vermin or the scale from plants; William W. Hanscon, deceased, San Francisco, hose coupling; Reuben W. Hent, San Francisco, roller bearing; Benjamin Holt, Stockton, header and thrasher; Benjamin Holt and J. Draper, Stockton, traveling thrasher; John and H. Jessen, Santa Ana, mold for artificial stone fences; Peter H. Croncke, Santa Rosa, counter shelf and belt tightener; William R Lindbey, Arcata, cartridge shell; John Main, French Gulch, vehicle brake; Daniel S. Regan, San Francisco, gas engine; John Ringen, Coronado, device for utilizing tide-power William W. Slater, Oakland, automatic bell ringer; Adolphus Emmer, Berkeley, water-proof preparation; James S. Williams, Oakland, zinc electrode for galvanic batteries; John C. H. Stutt, San Francisco, cable railway for turn-tables.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SAFETY CATCH FOR CARS OF INCLINED RAILWAYS.—Wm. C. D. Body, Grass Valley. No. 407,947. Dated July 30, 1889. This invention relates to that class of safety devices for use on the cars of incline railways in which a gravity hook is carried by the car and is held normally inactive, but which upon the breaking of the hoisting cable drops down to an engagement with the ties of the track or a fixed rack below. The invention consists in the novel construction and arrangement of the safety hook and its connections.

HOOP CLAMP.—Asa R. Wells, S. F. No. 407,559. Dated July 23, 1889. This invention relates generally to the class of devices adapted to be applied to the ends of hoops for tanks and other similar vessels, or cylindrical or circular bodies, for the purpose of drawing said ends together and tightening the hoop, and it relates particularly to that sub-class of these devices in which a left and right hand threaded bolt is seated in opposing heads attached to the hoop ends, and by its rotation draws the said heads together. The object of the invention is to provide a hoop clamp which is adapted to conform itself to the curvature of the hoop, so that the strain which it exerts shall be in the line of said curvature instead of tangential thereto.

FRUIT-PITTING MACHINE.—John Rosassco, Healdsburg, assignor of one-half to Joseph Cuneo, S. F. No. 407,965. Dated July 30, 1889. The invention relates to that class of machines in which the fruit rests upon a properly apertured and slitted bed, and a vertically movable spring-controlled punch provided with side-knives or cutters is brought down upon the fruit, whereby its flesh is cut and its stone or pit is driven out through the bed. The arrangement of spring devised by this inventor is simple and effective, and is less liable to get out of order than the spiral spring encircling the rod, as has heretofore been customary. The lever connection having the variable fulcrum is of advantage in providing a simple power device for imparting a perfectly vertical or perpendicular motion to the bent rod.

NEW WATER METER.—At the last meeting of the California Academy of Sciences Mr. Fr. Gutzkow gave an interesting description of an improved water meter, which will register accurately even drops of water passing through. There are two kinds of meters in use, one of which works with a small turbine-wheel, the revolutions of which are recorded, and the other works with a piston. Both are inaccurate, and while they sometimes register wrong for the company, they more than make it up against the consumer. Then they do not register when the water flows at a less rate than half a gallon per hour, and the Chinamen know this, and by letting a small stream run get their water for nothing and swindle the company. By the perfected meter this cannot be done, but it is so arranged as to protect both the water company and the consumer.

The Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

	Cash.	Debt.
Alta	$23 867	$.....
Alpha	822	.....
Andes	22 879	.....
Bodie Con	33,064	.....
Benton Con	94,323	.....
Belcher	.....	11,505
Belle Isle	485	.....
Best & Belcher	5,911	.....
Bulwer	6,600	.....
Bullion	11,266	.....
Challenge Con	.....	13 679
Caledonia	9,920	.....
Chollar	.....	38,018
Con. Cal. & Virginia	*75,924	.....
Confidence	12,236	.....
Con. Imperial	6,089	.....
Con New York	.....	13 180
Commonwealth	†	.....
Crocker	6,173	.....
Crown Point	.....	51,333
Del Monte	.....	13,309
Diana	4 888	.....
Exchequer	16,189	.....
Gould & Curry	14,433	.....
Grand Prize	.....	55,896
Hale & Norcross	3,063	.....
Holmes	.....	4,810
Independence	809	.....
Kentuck	.....	4,240
Lady Washington	22,079	.....
Locomotive	3,422	.....
North Belle Isle	.....	18,606
North Commonwealth	.....	37,622
Mexican	.....	208
Mono	11,732	.....
Navajo	.....	7,013
Occidental	15,579	.....
Ophir	33,056	.....
Overman	309	.....
Peer	1,070	.....
Peerless	6,736	.....
Potosi	.....	9,347
Savage	.....	60,089
Seg. Belcher & Mides	.....	4,879
Silver Hill	11,873	.....
Sierra Nevada	16,562	.....
Silver King	32 242	.....
Standard	6,464	.....
Syndicate	8,256	.....
Union Con	11,473	.....
Utah	.....	3,129
Weldon	7,319	.....

*There is in unsold bullion $55,169, with further shipments on July account to hear from.

†Overdraft of $25,049, with an offset of $29,500 bullion on hand.

Displacing a Stamp-Mill.

The Dodge ore pulverizers, manufactured by the Parke & Lacy Co., in this city, have been doing some remarkable work of late at various mines. It is only within the past year or two that the perfected machines have been put on the market, but since they have the results have proved them very satisfactory. It will interest many to know that in some instances rotary pulverizers have displaced stamps. The following letters are self-explanatory:

GRANITE, GRANT CO., OREGON, March 6, 1889.

Messrs. Parke & Lacy, San Francisco, Cal.—GENTLEMEN: Your letter came to hand asking me about the machinery. In justice to yourselves and Mr. Dodge, I have been intending to write to you for some time. The Dodge pulverizer, so far I can truly say, is a most excellent worker. The wear has been light and it does good work in every way. As far as wet crushing is concerned, if it holds out as it is doing (and I do not doubt it), it is in my opinion far ahead of stamps. No trouble whatever, and the stoppages amount to nothing.

Yours truly,

(Signed) J. B. CABELL.

The above mill was started in October last.

TEXAS MINE, REDDING, CAL., July 20, 1889.

N. P. Sheldon, Esq.—DEAR SIR: Your letter came to hand during my absence. I hasten to reply. Ours is a No. 2 machine, three feet in diameter. Our ore is very hard quartz. It is crushing now 12 tons of sulphuretted ore a day—all we can handle on two Frue machines. We could crush more, but the Frue machines won't handle the pulp. We have run nearly six months, and our expenses on machine have been $84 to date, and will run another month before we shall want bars. We amalgamate on plates 4 feet wide and 12 feet long, and save all free gold in the ore. We took out a stamp-mill to put in the pulverizer. We saved 60 per cent with the stamps Now 90 to 93 per cent by fire assay is saved. Stamps slime our ore. The pulverizer granulates it. We are well pleased with it, and it would pay you well to come and see it work if you contemplate purchasing.

Respectfully yours,

(Signed) HART & FLEMING, per R. G. HART.

LITTLE NELLIE MINE, SHASTA, CAL., July 29, 1889.

T. E. Dunbar, Esq.—DEAR SIR: I am not prepared to give you all the particulars that you desire, but am free to say that the Dodge pulverizer is my favorite. With No. 20 screen it will pulverize 13 to 16 tons per day, and do the work nicely. From what I have seen, I would not change for any other kind of a mill—not even if the other were to be furnished me free of charge and my money paid for the Dodge to be refunded in full.

Very truly yours,

B. N. BUGBEY.

The above mills are all the small-size pulverizers. The large size has double the capacity.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, term of subscription, and give it their own patronage, and as far as practicable aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

"WITTER'S SPRINGS." 16 miles from Lakeport, 20 miles east of Ukiah. Comfortable Hotel. Quiet Cabins. Lovely Scenery. Low Charges. Its waters are a sure cure for Dropsy, Scrofulous and Skin Diseases, Rheumatism, etc. Address H. L. DENIO, Upper Lake.

DEWEY & CO.
AMERICAN AND FOREIGN PATENT SOLICITORS
ESTABLISHED 1860.
OFFICE OF THE "Mining and Scientific Press" Pacific Rural Press"
No 220 Market St.
TAKE ELEVATOR No 12 FRONT ST.
SAN FRANCISCO, CAL.

RUBBER FACTORY.



Monarch Belting.
The Plies of this Belt are
UNITED by COTTON RIVETS
Which hold them firmly together.
Each Rivet is Independent
And Follows the Stretch.
THERE ARE NO STITCHES
TO BREAK, and
The Belt has a Smooth Surface.

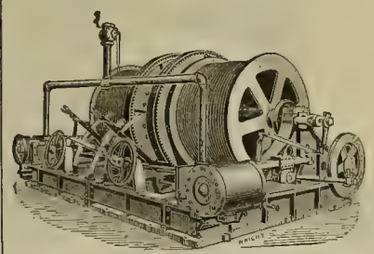
Hose, Belting, Packing, Etc.
ALL KINDS OF RUBBER GOODS MADE TO ORDER IN A FEW HOURS.
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ESTABLISHED 1866.
Pacific Chemical Works.
HENRY G. HANKS,
Practical and Industrial Chemist, Assayer and Geologist,
718 MONTGOMERY ST., - SAN FRANCISCO.



Will report on the condition and value of any mining property on the Pacific Coast. Rare Chemicals made to order. Instructions given in Assaying and Practical Chemistry.

HOISTING ENGINES FOR MINES



1, 2, or 4 Drums, with Reversible Link Motion or Pat. Improved Friction.
MADE ONLY BY THE
LIDGERWOOD M'F'G CO.,
96 Liberty St., New York.
34 and 36 West Monroe St., Chicago.
197 to 203 Congress St., Boston.
PACIFIC COAST AGENTS,
PARKE & LACY CO., San Francisco.
New Catalogue for 1889 now ready.

FOR SALE.
One 10x13 inch Clayton Belt Air Compressor.
One 3-inch Sergeant Drill.
One 5-ft. Double Screw Drifting Column with Arms.
One 4-ft. Single Screw Stoping Bar.
One 8½x13 ft. Air Receiver.
One Tustin Pulverizer, with new wearing parts, such as Rolls, Grates, etc.
The above are in first-class condition and will be sold cheap. For price apply to the
PAYMASTER MINING CO.,
Yuma, Arizona Territory.

HORACE D. RANLETT,
Ores, Mining, and Commission,
420 Montgomery St., S. F.
Ships under advances to smelting works in Boston, New York, Baltimore and Liverpool.
Twenty-one years' experience in Shipping Ores and Managing Mines.
Solicits Consignments of Copper Produce and Management of Mining Matters.
All business conducted on Cash Basis.
Purchase and shipment of Mining Supplies A SPECIALTY.
Sales of Developed Copper Mines undertaken.
Business Manager of UNION COPPER MINE, Copperopolis, Cal.; NEWTON COPPER MINE, Amador Co., Cal.

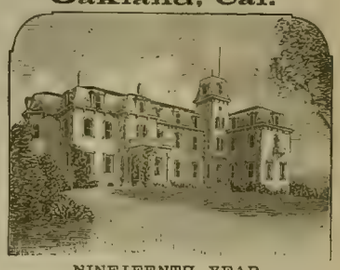
THE CALIFORNIA CONSOLIDATED Gold Mining Company, Sierra City, Cal., A. Schubert, President; Alvin Fischer, Secretary; A. Leffer, Superintendent. Divided into 300,000 shares at $1 each. Property comprises two locations. Ore assays $7 per ton, average. Coarse gold, solid rock; vein from 15 inches to 2 feet wide Tunnel No. 1 in 120 feet, and prospects well. No. 2 just begun. Stockholders: Alvin Fischer, A. Schubert, Gus Fischer, F. L. Fischer, Anton Fischer, Fred Fischer. For information concerning stock, etc., apply to F. L. Fischer, Sierra City.

THE BUFFALO CONSOLIDATED GOLD Mining Company, Sierra City, Cal., Ernest Busch, Superintendent. Stock divided into 600,000 shares at $1 per share. The property comprises 5 locations. Ore finely decomposed, carries coarse gold. Size of ledge: Tunnel No 1, 22 ft; No. 2, 9½ ft.; No. 3, 10 ft. Fine black decomposed rock interspersed with white quartz. New 10-stamp mill run by a Pelton Wheel, blacksmith shop and boarding house. Stockholders: Ernest Busch, Hugh Murray, Frank Cook, J. G. Lee, Henry Carpenter. For further information apply to Ernest Busch, Sup't, or Hugh Murray, Sec'y.

Educational.

SNELL SEMINARY,
No. 568 Twelfth Street,
Near Broadway, OAKLAND.
A Boarding and Day School for
YOUNG LADIES.
Fall Term begins Monday, August 5, 1889.
Send for Catalogue to
MARY E SNELL, RICHARD B. SNELL } Principals.

HOPKINS ACADEMY,
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NINETEENTH YEAR.
Next Term begins..... August 6, 1889.
A first-class School. A beautiful, pleasant home.
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W. W. ANDERSON, Principal.

School of Practical, Civil, Mechanical and MINING ENGINEERING,
Surveying, Architecture, Drawing and Assaying
723 MARKET STREET,
The History Building, SAN FRANCISCO, CAL.
A. VAN DER NAILLEN, President.
Assaying of Ores, $25; Bullion and Chlorination Assay, $25; Blowpipe Assay, $10. Full course of assaying, $50.
Send for circular.

The Evans School OF PRACTICAL ASSAYING,
Rooms 6 & 7, First Floor Sherman B'g. } 606 Montgomery St., San Francisco.
Also, Evening Classes, 7 to 10 o'clock.
JOHN T. EVANS, M. A., Principal.

CRAWFORD
English and Manual Training School,
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Second year will open on Wednesday, August 7th. Day and Boarding-School for boys. Day School for girls. Catalogues sent on application to
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P. O. Box 893, Oakland, Cal.

THE PIONEER COMMERCIAL SCHOOL
Established 1863. PACIFIC Business College, 320 POST ST. SAN FRANCISCO. Oldest and Best.
LIFE SCHOLARSHIPS, $75.
NO VACATIONS. DAY AND EVENING SESSIONS.
Ladies admitted into all Departments.
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BUSINESS COLLEGE,
24 POST ST., S. F.
FOR SEVENTY-FIVE DOLLARS THIS College instructs in Shorthand, Type Writing, Bookkeeping, Telegraphy, Penmanship, Drawing, all the English branches, and everything pertaining to business, for six full months. We have sixteen teachers, and give individual instruction to all our pupils. Our school has its graduates in every part of the State.
SEND FOR CIRCULAR.
E. P. HEALD, President.
C. S. HALEY, Secretary.

Smelter For Sale or Exchange.
One 60-ton. wrought iron, water-jacket Smelting Furnace (36"x60" at the tuyeres) of the latest design, with Crusher, Blower, Boiler, Pumps, Engines, Tools, and everything complete for immediate delivery, and only used about six months. Cheap for cash, or will exchange for interest in a Lead-Silver Mine, or erect in any mining camp that will guarantee a certain output. For further particulars address Box 28, Elkhorn, Montana.

For Sale Cheap—2 Steam Engines,
Union Iron Works make, 12x24 Cylinder, Myers Cut-off, one 10x16 Cylinder, plain Slide Valve. In good condition. For Sale at the
JUDSON MANUFACTURING COMPANY,
Office No. 14 Fremont Street, San Francisco. Call from 1 to 4 o'clock P. M.

—THE—

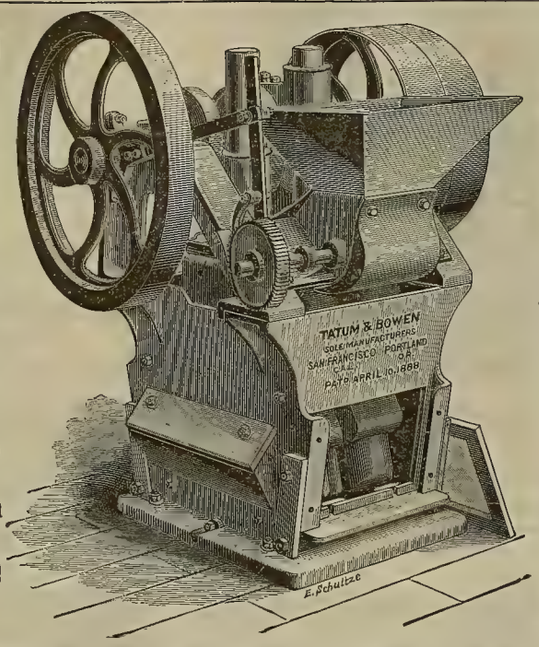
PERFECTED

DOUBLE

Economic

Quartz

Mill.



Attached to each Mill is an effective

Automatic Ore Feeder.

THE CRUSHING is done by the rapid rocking movement in OPPOSITE DIRECTIONS of two heavy castings, the bottoms of which are slightly circular in form, and each provided with our shoes.

The Mill is a closer Gold-Saver and catches a larger percentage of the Clean-up in the Battery than any other Mill.

It costs less, in proportion to what it will do, than any other mill. There are no working parts to buy for it, no matter how long it is used, except shoes and dies. Capacity of Mill, 6 to 10 tons per day. Weight of Mill, complete, 6400 pounds.

We manufacture, to go with the Mill, an

IMPROVED ROCK BREAKER.

Power required for Mill and Rock Breaker, 6 H. P. SEND FOR CIRCULAR. Address:

TATUM & BOWEN,

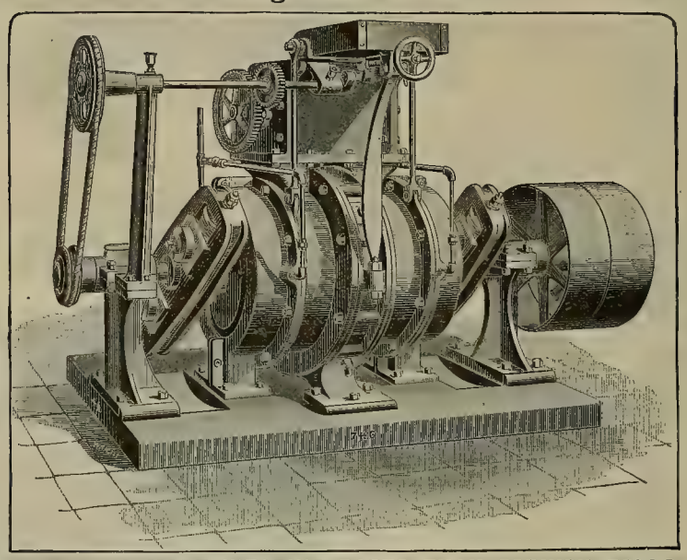
34 and 36 FREMONT ST., SAN FRANCISCO, CAL.,

AND PORTLAND, OREGON.

MANUFACTURERS OF MINING AND SAW MILL MACHINERY.

FRISBEE WET MILL.

This Mill, with a weight of less than 9000 pounds, has a capacity of three tons per hour of hard quartz to 40 mesh; has been thoroughly tested; we guarantee its work as represented, and we will give long time trial.



IT HAS NO MORE WEARING PARTS THAN CORNISH ROLLS,

And renewals will not cost over one-half as much as for stamps. Will run empty, or with small amount of ore without injury. The attention of parties having Cement Gravel is called to this Mill, as it will run 100 tons per day to No. 8 mesh; 30 to 35 H. P.

OUR DRY MILLS are the most economical ever built, and are extensively used with record of several years. No grinding in pans. Mill finishes to any fineness desired.

FRISBEE-LUCOP MILL COMPANY.

GIDEON FRISBEE, Manager, - - 59 & 61 First Street, San Francisco

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FOR SALE CHEAP.

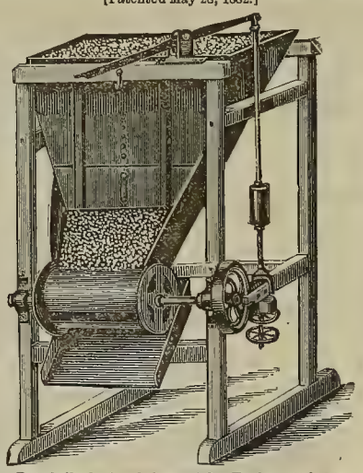
One new double circular Sawmill to carry 60-inch bottom saw, with wrought-iron hangers for top saw. Friction feed-works, patent steel screw double-throw head-blocks, with track iron, saw carriage and frame complete.

RISDON IRON & LOCOMOTIVE WORKS,

San Francisco, Cal.

THE ROLLER ORE FEEDER

[Patented May 28, 1882.]



THIS is the best and cheapest Ore Feeder now in use.

It has fewer parts, requires less power, is simpler in adjustment than any other. Feeds coarse ore or soft clay alike uniformly, under one or all the stamps in a battery as required.

In the Bunker Hill Mill it has run continuously for two years, never having been out of order or costing a dollar for repairs.

Golden State and Miners' Iron Works,

Sole Manufacturers,

327 First Street, San Francisco, Cal.

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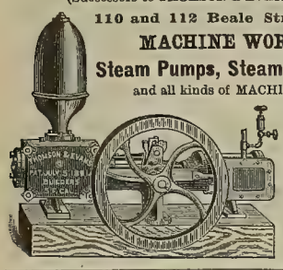
(Successors to THOMSON & EVANS),

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MACHINE WORKS,

Steam Pumps, Steam Engines

and all kinds of MACHINERY.



DEEP WELL PUMPS

CLAYTON

AIR COMPRESSORS

For Working

Rock Drills, Coal Cutters, Hoisting Engines and Water Pumps in Mines and Tunnels, Sinking Caissons, Etc., Etc.

SEND FOR CATALOGUE No. 6.

Clayton Air Compressor Works,

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Home for Children.

A lady would take care of two or three children over two years of age. A good home and very best of care in every respect. References given and required. MRS. T. A. MOODY, 169 Eighth St., Portland, Or.

GO TO

American Exchange Hotel,

Sasnome St., San Francisco. One door from Bank of Cal.



Rates $1, $1 25 and $1.50 Per Day. Free Coach.

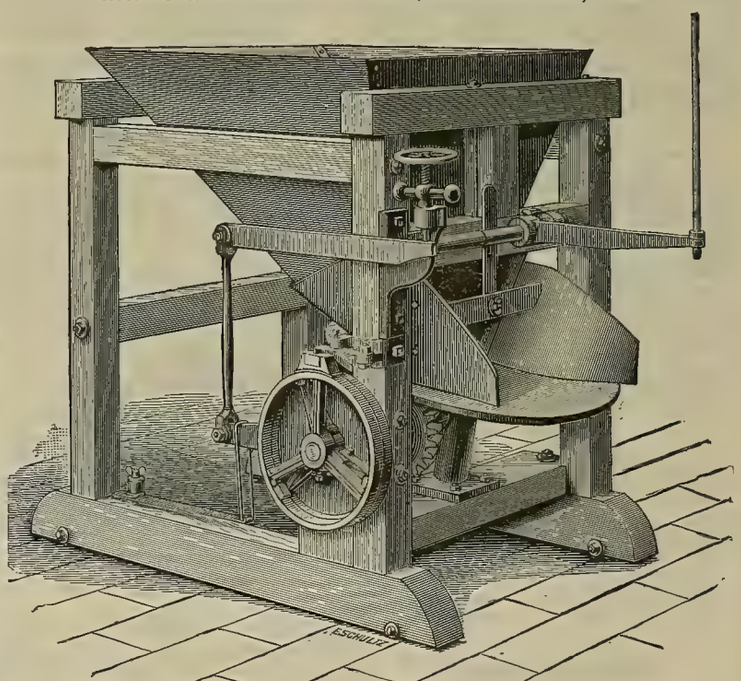
The above Hotel is situated in the midst of the Banking and Commercial Houses of the city, and is by far the most home-like and desirable Hotel to stop at.

CHAS. & WM. MONTGOMERY, Prop'rs.

—THE—

JOSHUA HENDY MACHINE WORKS,

Nos. 39 to 51 FREMONT STREET, SAN FRANCISCO, CAL.



"HENDY" IMPROVED "CHALLENGE" ORE FEEDER.

The best form of Feeder ever devised, and pronounced by reputable mining men to be far superior to any form of "Roller" Feeder manufactured. We refer to the following gentlemen who have furnished us with testimonial letters to the above effect, which can be seen at our office, viz.:

N. W. CROCKER, Supt. Bunker Hill Gold Mining Co., Amador City, Cal.

W. G. ROBERTS, Greenwood, El Dorado Co., Cal.

D. C. WICKHAM, Taylor Mine, Greenwood, Cal.

J. R. TREGLOAN, Supt. South Spring Hill Gold Mining Co., Amador City, Cal.

WE ARE MANUFACTURERS OF THE

"CHALLENGE," "STANFORD," "TULLOCK," & "ROLLER" FEEDERS,

And will furnish descriptive Catalogues and quote prices upon application.

The Cotton Trade of the World.

The world's cotton supply is constantly growing more and more interesting. Notwithstanding the rapidly increasing supply all over the world, great anxiety is always felt at the indications of a short crop anywhere, and especially in the United States. The recent crop reports of the Department of Agriculture indicate a slight increase in this year's crop, while arrivals at European ports from India and Egypt promise to be in excess of the receipts of last year. Still the world's supply is not fully up to the demands of the manufacturers, either in this country or Europe. There are at this present writing strong grounds for higher prices the coming fall. Stocks in Great Britain are thought to be in a fair position to meet ordinary demands; but continental stocks are low. If cotton would remain at present prices for American middlings, the production of the world would have to be largely increased to meet the growing demand.

Russia's Efforts in Transcaucasia.

In view of this state of facts, much interest is manifested in the efforts to extend the culture of cotton in the Eastern hemisphere. The Russians are taking an active interest just now in introducing not only its culture, but its manufacture as well, in Transcaucasia. The cotton area of this region has been very considerably extended the present season, with every probability that further additions will be made from year to year. Many Moscow firms are engaged in the cultivation of cotton in the government of Erivan, and last spring gave unusual attention to the planting of superior seeds and improved cultivation. It is reported that the planters there expect to gather from 36 pounds of seed a crop of 900 pounds of seed cotton, which will yield 360 pounds of lint. This implies high cultivation and heavy growth of staple. The American cotton gin is in use in parts of Transcaucasia. One Moscow firm has six in operation, made in Massachusetts. Some English gins are also in operation. They are spoken of as giving satisfaction. The natives are ginning their cotton and delivering to first hands, avoiding as much as possible the middlemen. The American seed is being freely distributed among the natives, and marked improvement is already noted in the yield.

The Bombay Cotton Movement.

The Bombay cotton reports for May indicate that there is a growing demand for exports, notwithstanding the demand for home consumption. The freight demand had so stiffened prices that the local mills were holding, and purchases on their behalf had not exceeded 10,000 bales. The report says: It is certain that there will shortly be a good demand from this quarter, as the stocks at the mills are low, and the monsoon requirements must shortly be filled. Attracted, no doubt, by the high prices now ruling, receipts have been on a large scale, and at present show no signs of falling off.

It is quite possible that even the highest estimates of the exports to Europe for the current six months may be exceeded, which, however, will be at the expense of the latter half-year's shipments. At the date of the report the shipments were very large and more than kept pace with the rate of receipts. Nearly 1,050,000 bales had already been exported, and the total for the current six months was expected to exceed 1,100,000 bales, which was considerably above the largest estimate.

The Egyptian Cotton Crop.

The condition of the growing Egyptian cotton crop is reported to be favorable. The following is from the Cotton Association at Alexandria, dated May 31st: The temperature in general, during May, has been favorable for the growing crop; the plants are fully developed and look well. The distribution of water continues satisfactory; cotton lands are easily irrigated and in some places even by gravitation. This condition is due to the Barrage and to the system of rotation established throughout the country. By these means the water is maintained at a relatively high level. The deficiency of water at Cairo this year is insignificant as compared with the previous three years, in spite of the large deficiency at Assouan. The area sown with cotton is equal to that of 1888. All information tends to show that the condition of the growing crop is very satisfactory. The well-grown plants have the advantage of being better able to resist adverse circumstances; but it is impossible, as yet, to appreciate what circumstances, either for good or evil, may arise.

Egyptian Cotton in Ancient Times.

In Egypt, cotton has been cultivated for many centuries past. Pliny (in the year 79) mentions it as existing in Upper Egypt. Egyptians esteemed cotton fabrics very highly, as shown by the Biblical records of the period of the Hebrew sojourn in Egypt. Joseph received as a gift a robe of cotton from the Pharaoh then reigning.

Arabs were the first to introduce cotton cultivation into Southern Europe, and to establish cotton fabrics in Spain. Abu Abdallah sent presents of cotton goods made in Spain to the Emperor Charles the Great; and under Abd-er-Rhaman, during the 10th century, the cotton industry was in a very flourishing condition.

At the time of the discovery of America, its inhabitants were familiar with cotton. It was among the presents given to Columbus by the Guanahani, and the people of Hispaniola had to furnish him with 25 pounds of cotton every three months. Large stores of cotton and cotton fabrics were found in Cuba at that time.

Excavator for Auriferous Gravel.

The accompanying cuts are views of the excavator buckets used in the mechanical movement of auriferous gravel from the Lambing or Arroyo Seco gravel mine, Amador county. By means of derricks, fitted with these buckets, excavations as deep as 60 feet have been made. The derricks can put the material up to a hight of 45 feet. The buckets are swung on a boom which describes a semi-circle in the air of 220 feet. The bucket rises from the ground, the arm of the derrick swings toward the point designated, dumps its load, and returns to refill itself, and consuming from three-quarters of a minute to two minutes on the trip, according to the hight it is raised and the distance swung. The depth of overlying gravel and loam in this claim is about 26 feet, and the pay gravel below is 4 feet.

Two derricks are employed; the weight of each, including accompanying machinery, is from 75 to 80 tons. The length of the boom, the outer end of which is elevated 58 feet, is 114 feet; it is capable of carrying a load of 7 tons, but usually lifts about 2 cubic yards of gravel. The boom is made of Oregon pine, 12 inches by 18 inches at the foot, 12 inches by 24 inches in the middle, and 12 inches by 12 inches at the outer end, where a four-foot sheave is located, which carries the hoisting cable, a flexible steel-wire rope, one inch in diameter. The machine is handled by an operator, called a lever-tender, who stands about 50 feet above the foot of the mast, in a little house, near the top of the mast, where levers are attached by gas pipe to the machinery below. All is under the management of this man, who, owing to his elevated position, has full view of the surroundings and perfect control of the entire operation.

The steam cylinder is located on top of the bucket; the steam passes through inch gas pipe of various lengths, connected with globe and socket joints for flexibility. The pipe connects the cylinder with the steam drum of the boiler of the derrick. As soon as the bucket on descending has reached the gravel, steam is turned into the cylinder by means of a five-way valve, below the piston head. This causes the piston rod to rise and draw together the clasping parts of the bucket which enfold the load; by turning the valve still further, the steam enters above the piston head, forces the rod down, and empties the bucket; turned still further, the steam escapes. Each derrick has two boilers and two engines provided with link motion.

This peculiar bucket or lift was patented through the MINING AND SCIENTIFIC PRESS Patent Agency, by J. P. Lambing and S. N. Knight. A machine of this character is now being built at Golden, Col., under the superintendence of Mr. Lambing. It is useful wherever there is "low" ground with no facilities for dump.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, department 10, San Francisco:

SILVER WAVE G. & S. M. CO., Aug. 5. Location, Virginia, Nevada. Capital stock, $10,000,000. Directors—T. D. McKenna, H. H. McAllister, T. K. Wilson, C. W. Kellogg and W. H. Nelson.

MOUNTAIN WOOD AND LUMBER CO., Aug. 5. Capital stock, $50,000. Directors—S. D. Smith, A. Rixon, J. Martin, A. J. Mitchell and D. M. Dysart.

PACIFIC TILE AND BRICK CO., Aug. 6. Capital stock, $100,000. Directors—J. T. Davis, M. H. Turrill, M. C. Jewell, C. B. Turrill and J. F. Davis.

DEERE IMPLEMENT CO., Aug. 6. Object, to manufacture and deal in agricultural implements and machinery. Directors—Chas. H. Deere and Stephen H. Velie of Moline, Ill.; Marcus C. Hawley of Newton, Conn.; Geo. T. Hawley and Fred W. Vaughan of Oakland, Cal.; Walter N. Hawley of Santa Barbara, and Edward A. Wheeler of San Francisco. Capital stock, $200,000.

RUSSIAN COTTON FACTORIES IN ASIA.—According to Mr. Charles Marvin, a company is erecting a large cotton-mill at Samarcand and another is to be built at Merv. Baron Alphonse Rothschild is arranging to invest a large sum in the cotton-pressing business in Bokhara, and a Russo-American syndicate is preparing to compete with him for business. Yet it is only a few years since Vamberg went through that country disguised and in fear of his life from the Tekke and Yonmat Turcomans. Now all that is changed. The Russians first conquered the wild tribes and then gave them work at railroad building; the next move was to open a system of irrigation and import cotton seed, several tons of upland cotton seed having been imported from this country. The mills follow the cotton as a matter of course in a protectionist country.

ERRATUM.—In the article on Tuolumne mines in last week's PRESS, page 83, is the following sentence: "The ditch made sufficiently large to carry the required volume of water necessary for the *wood* can be constructed at a cost not to exceed $7000." The word "wheel" should be substituted for "wood."

Connecting the Apron and Battery.

(*Continued from page 101.*)

stead of being flat, the rounded form being better adapted for saving the gold. The aprons here in use are five feet by four feet, with an inclination of 1½ inches to the foot; at their lower end is a drop of about a foot to the sluices; the pulp, however, does not drop, but flows downward on a curved plate, which catches a good share of amalgam.

Callustro

Is the name which has been given to a substance recently discovered on a farm near Calistoga, Napa Co., Cal., the property belonging to Mrs. Emma P. Eells of Oakland. Scientists and mining experts who have examined callustro agree in pronouncing it a most useful and valuable discovery, particularly for the wonderful cleansing and polishing properties which it has been found to possess.

Professor H. G. Hanks, formerly State mineralogist, gives his analysis, showing it to contain silica, alumina, magnesia and many other ingredients.

He further says: "It is entirely new to him, nothing like it ever having come to his hand before, and that in its finest powdered form, under the microscope the motes still show the keenest and sharpest cutting edges, rendering it extremely valuable as a polishing agent. The extended and critical tests to which it has been subjected has more than borne out this prediction. In powdered form, though a gray, flour-like substance, free from grit, delicate and soft to the touch and exceedingly agreeable to the skin, it polishes each of the common and precious metals in use as well as glass and all precious stones with marvelous quickness and a luster that is wonderful, and possessing the invaluable property of remaining a much greater length of time than the luster of any other known polish."

Mrs. Eells has displayed remarkable fertility and business qualifications in finding out the many valuable uses to which her mineral could be applied, viz., introducing it into several qualities of soap very effective for removing grease and stains of all kinds from cloths and the hands; also as a tooth powder, nail enamel, needle-polisher, metal polish unequaled, and not by any means least, as a remarkably fine natural paint and kalsomine.

For the purpose of placing callustro upon a commercial basis, a corporation has been formed with a capital stock of $100,000, and composed entirely of well-known ladies of Oakland, with Mrs. Emma P. Eells as president, with the following board of directors: Mrs. Susan L. Mills, Mrs. Sarah Haight Tompkins, Mrs. M. Belle Holmes, Mrs. Clara F. Hamilton, Mrs. Rebecca Knox, Mrs. Phœbe Watkins. The company are busily engaged in preparing and placing their goods, in various forms, upon the market, and judging from actual use and the numerous reliable testimonials at hand, as well as the already great demand for callustro, it is safe to pronounce the enterprise an assured success.

Fire-Proof Paint.

Messrs. C. A. Scoville & Co. 471 Ninth street, Oakland, have recently taken the Pacific Coast agency for the New York Fire-Proof Paint Co. These paints have been introduced in the Eastern and Southern States with marked success, and are being used in great quantities. They are prepared of the best materials, and in durability, spreading, covering and finishing qualities, compare favorably with any first-class paint. All colors are put up in pails and barrels, mixed and ready for the brush, requiring only to be stirred before and while in use. The Vulcan brand is adapted to the finest work on hard surfaces, the Soteria being intended for use on rough interior surfaces, such as floor beams, lath, etc. The fire-proof qualities of the paints have been subjected to most severe and critical tests in various cities, substantiating in every instance the strong claims made by the manufacturers. Many testimonials are at hand from prominent architects and insurance men throughout the country, a couple of which are herewith given:

Fire Underwriters' Association.

NEW ORLEANS, March 16, 1888.

Messrs. Giffney & Co., Agents New York Fire-Proof Paint Co., 23 Union street, New Orleans: DEAR SIRS:—I take pleasure in transmitting to you the following action in regard to your Vulcan paint and Soteria.

Resolved, That this association, after the severe test witnessed by the Fire Committee and numerous other members of the association, being convinced of the fire-resisting qualities of the Vulcan paint and Soteria, manufactured by the New York Fire-Proof Paint Company, has no hesitancy in recommending it as a protection against fire. Respectfully,

GEO. MATHER, Secretary.

Coronado Fruit-Package Co.

John McArthur, Esq., Oakland, Cal.:—DEAR SIR: In reply to yours to the Portable House Company, I have to say we have used the New York Fire-Proof paint on and in our factory, and consider it better than insurance. We feel very safe from accident by fire, and, in consequence, shall not insure. Yours truly, E. DENSMORE.

The especial attention of architects and builders on the Pacific Coast is called to C. A. Scoville & Co.'s advertisement in another column.

THE Southern Pacific Co. has in contemplation 320 miles of extension in their California roads during the next year. Orders have already been placed with Eastern manufacturers for 30,000 tons of steel rails, and it is expected that double that quantity will be required to complete the contemplated extensions.

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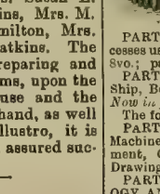
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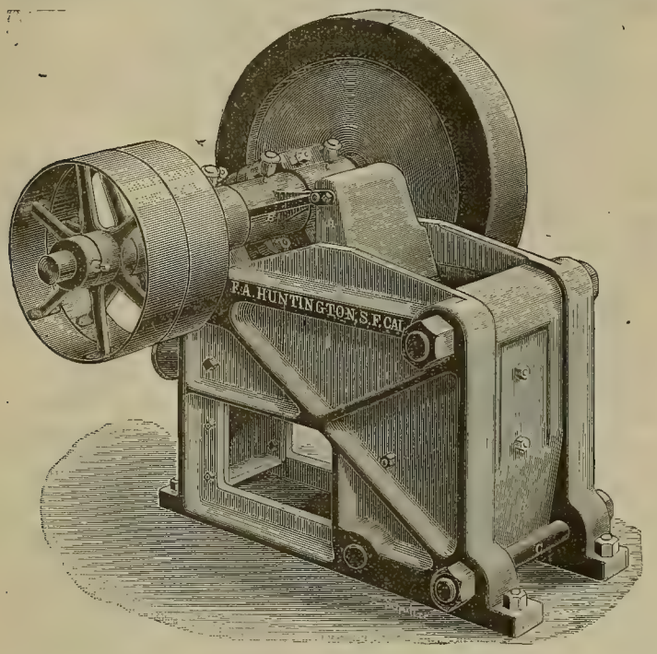
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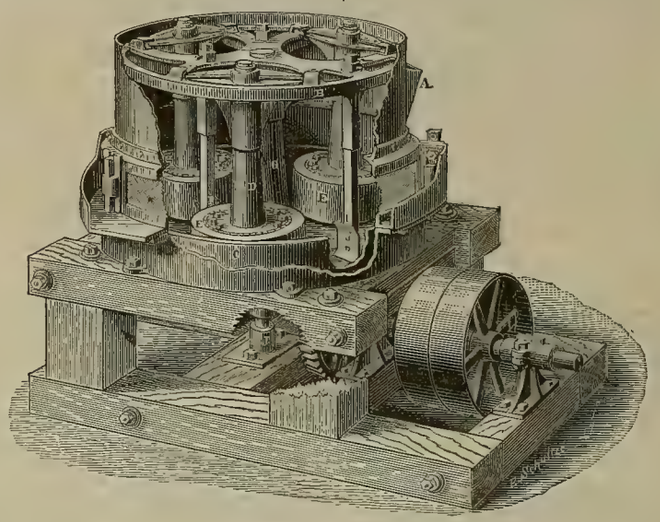
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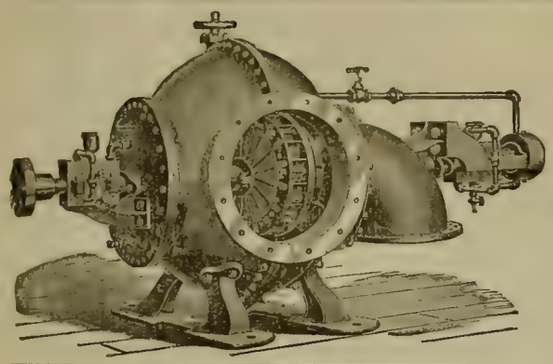
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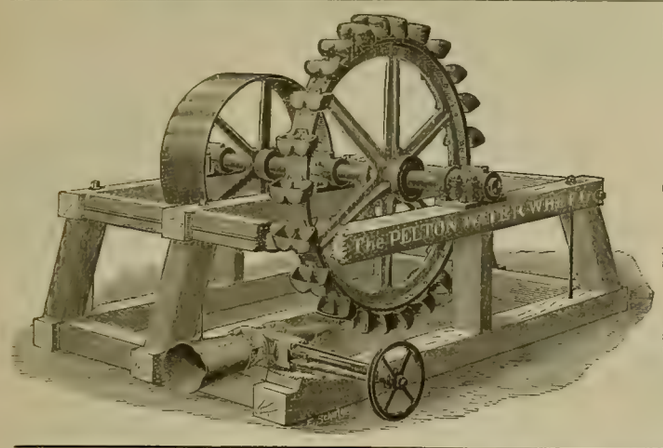
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Aug. 7, 1889.

General trade the past week was only fair. So far the summer trade has been disappointing. The large proportion of interior merchants appear to confine themselves to assortment buying, deferring stock purchases as late in the season as possible. Harvest-field work is about over, and now farmers are chiefly engaged in delivering their grain. It is generally reported that about all is going into the warehouses, owing to the prices not being high enough to induce selling. Foundrymen do not report an active business. Although there is a large increase in the number of buildings going up, yet very little iron is being used in their structure. This is due to a change in style of architecture, which requires in large business buildings stone work instead of iron.

In the local market money is reported to be easy, with all legitimate wants readily met by the banks at current rates of interest. It is claimed that less money is now tied up than at this time in 1888. In this month last year there were large quantities of wheat and wool warehoused, while now there is comparatively little. Other articles of trade, it is said, show a similar change. Mr. Rideout, a leading banker in the Sacramento valley, states that a larger proportion of the wants of farmers on warehouse receipts for grain will be met in the interior than ever before. Advices from other parts of the State are of the same tenor. While this will probably be the case, yet owing to the large crop, more money will be required than for several years past, unless prices for wheat advance so as to induce selling. Remittances from the interior are light, but not more so than usually obtains at this season of the year. Free remittances are looked for toward the close of this month.

The call for money for speculative purposes has been light. The chief inquiry comes from dealers in grain futures, as both mining stock and local securities are now not very attractive to outside operators.

The steamer Belgic, hence August 3d for China, took out the following treasure: To Hong Kong, Mexican dollars, $108,140; gold coin, $7756; silver bullion, $91,000; gold-dust, $960. To Shanghai, Mexican dollars, $66,000. To Japan, Mexican dollars, $51,000; silver bullion, $297,000.

The amount of treasure in the Sub-Treasury in this city was as follows on July 31:

United States notes	$54,933 00
National Bank notes	10,380 00
Gold coin	38,763,624 00
Standard silver dollars	18,133,807 00
Fractional silver	6,684,551 60
Gold certificates	3,280 00
Silver certificates	60,225 00
Minor coin	6,793 50
Total	$63,707,694 00

The shipments of silver from the Sub-Treasury into the interior of the State and elsewhere for the month were as follows:

Standard dollars	$264,260
Fractional silver	68,000
Total	$332,260

MEXICAN DOLLARS—The market has held fairly steady at from 74@74½c. The demand is only fair. With the Chinese returning to the city for wintering, more business is looked for. Dealers in Mexican dollars state that the number of Chinamen on this coast is steadily decreasing.

SILVER—The market eased off some the past week in sympathy with lower prices abroad. Sales were made at 92⅛c an ounce. The decline in our market is also due to sterling exchange being heavy, with the tendency to lower figures. London cables quote silver bullion to-day at 42 3-16d. New York is quoted at 92@92⅛c, and our market closes at 92¼@92½c. The latter price only obtainable under exceptional circumstances.

QUICKSILVER—Receipts at this port in last month and for the first seven months of the year compare as follows:

	For July.	Jan. 1 to July 31.
1887 flasks	1,759	13 342
1888	1,355	15,930
1889	1,278	9,483

Receipts at this port the past week aggregated 281 flasks. The market is reported quite strong in sympathy with foreign advices. The consumptive demand is only fair.

BORAX — Receipts the past week aggregated 2304 ctls. This is the heaviest weekly receipt in this year. The market is steady. There was shipped the past week 22,929 lbs. to Chicago, via C. P. R. R.

LIME—Receipts the past week aggregated 5302 barrels. The demand continues free at unchanged prices. Honolulu drew 300 barrels the past week.

TIN—The market is quiet but steady. Sales are making at quotations for spot parcels. The advance in outward freights from England is at present against forward shipments. Imports the past week were 10 boxes plate overland, and 2312 ingots from Australia. There was shipped to Victoria, B. C., 54,000 lbs. plate and 3821 lbs. pig.

LEAD—The exports by sea the past week aggregated 3552 lbs. to Victoria, B. C. The market has ruled fairly steady at firmer prices. Eastern advices report more of a speculative movement, which, with the consumptive demand, caused a strong market there.

COPPER—The market shows more strength. This, no doubt, is due to advices that negotiations between the Tharsis Company officials and the liquidator of the old Comptoir d'Escompte are likely to result satisfactorily. Some of the American companies are shutting down owing to the low prices not covering the cost of production. A meeting of the Lake companies is to be held soon so as to determine on the future course in both production and marketing the metal. The past week a shipment by sail of 12,595 lbs. of copper matte was made direct to Liverpool, England.

COAL—Imports the past week were as follows: From Comox, 4300 tons; Seattle, 2550; Tacoma, 8500; Port Townsend, 750; Departure Bay, 2127; overland, 40; Coos Bay, 700; total, 18,967 tons. In the local market the tone does not appear to be quite so confident, owing to the free output of the coast collieries and more ships heading this way from Australia. A local exchange says that Australian dates of July 1st quote coal freights as follows: Newcastle for San Francisco, 13s; to San Diego and Wilmington, 15s. Best screened coal at Newcastle was quoted at 11s. This makes coal and freight to San Francisco 24s., or $6 per ton. The duty on arrival is 75c per ton. The cost of freight coal from the Puget Sound and British Columbia mines to this port is $2.25 and $2.50 respectively. A new deposit of coal has been discovered in British Columbia, which will be known as the North Wellington. Samples show it to be a strong coal.

IRON—In the local market last week's report covers this week's advices from dealers and consumers. English advices continue to report an irregular but strong market. Eastern advices report a strong market.

The following are the latest comparative quotations f. o. b. at Glasgow:

	Aug. 1, '89.	July 26, '89.
F. o. b. Glasgow.		
No. 1 Coltness	57s 6d	57s 6d
" Langloan	56s 6d	56s 3d
" Summerlee	57s 6d	56s
" Gartsherrie	55s 6d	55s
At Ardrossa.		
No. 1 Eglinton	46s	45s 9d
" Glengarnock	53s	53s 6d
" Dalmellington	47s 6d	47s

Eastern Metal Markets.

By Telegraph.

NEW YORK, Aug. 7, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	42⅜	92¾	$11 90	$3 97½	$19 75
Friday	42⅜	92½	11 75	3 97½	19 85
Saturday	42 5-16	92½	11 75	3 97½	19 85
Monday		92½	11 70	3 90	19 80
Tuesday	42¼	92⅝	11 85	3 87½	19 85
Wednesday	42¼	92⅝	11 85	3 87½	19 85

NEW YORK, Aug. 7.—The iron markets are as firm as ever. Consumers are looking for early instead of delayed deliveries of contracts. Steel is very firm, $28 being asked for rails, with two months' business in the hands of the mill-owners. Stock speculation displays a strong undertone on the crop and traffic outlook, but there is neither interest nor activity in trading. Lake Ingot copper still quoted at 12c. Export bid about 11c. Electric and good casting grades at 10¾@10¾c. Common, 10@10¼c. The Boston *Transcript* estimates the output of Lake Superior mines at 42,000,000 lbs up to date, against 38,000,000 lbs for the corresponding period of last year. Pig lead is doing better, $3.95@4. August and September delivery 1000 tons. Borax fair; business full at recent figures. Quicksilver higher. Sales at 70@72c. Late Rothschild cable quoting at £9 15s.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, August 8, 1889.		
ANTIMONY—	15 @	16
BORAX—Refined	7¼@	7⅞
Powdered	7¼@	
Concentrated	— @	6½
COPPER—		
Bolt	21 @	22
Sheathing	22 @	24
Ingot, jobbing	15 @	16
do, wholesale	12 @	13
Fire Box Sheets	22 @	24
LEAD—Pig	4½@	4⅔
Bar	6 @	—
Sheet	7 @	—
Pipe	6 @	—
Shot, discount 10% on 500 bags Drop, ₱ bag.	1 45 @	—
Buck, ₱ bag	1 65 @	—
Chilled, do	1 85 @	—
STEEL—English, lb	16 @	20
Canton tool	9¼@	—
Black Diamond tool	10 @	16
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4¼@	—
TINPLATE—B. V., steel grade, 14x20, P. S	4 60 @	4 65
B. V., steel grade, 14x20, spot	4 80 @	4 90
Charcoal, 14x20	6 25 @	6 75
do roofing, 14x20	5 12½@	5 25
Pig tin, spot, ₱ lb	21 @	21½
do, do, prompt shipment	— @	—
QUICKSILVER—By the flask	47 50 @	50 00
Flasks, new	@	—
Flasks, old	35 @	
COKE—Eng., ton, spot, in blk & sks, resptvly	17 00 @	19 00
Do, do, to load	13 00 @	13 25
	Spot.	To Load.
IRON—Glengarnock ton	27 00 @	— —
Eglinton, ton	26 00 @	— —
American Soft, No, 1, ton	— — @	31 00
Oregon Pig, ton	— — @	30 00
Clay Lane White	— — @	24 50
Shotts, No. 1	28 50 @	29 00
Bar Iron (base price) ₱ lb	2½@	3
Chrome iron ore, ₱ ton	— — @	10 00

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$19 00	$16 00
41 to 50 ft	20 00	17 00
51 to 60 ft	22 00	19 00
61 to 70 ft	26 00	22 00
1x3, fencing	21 00	18 00
1x4, "	20 00	17 00
1x3, 1x4 and 1x6, odd lengths	18 00	15 00
Second quality	16 00	14 00
Selected	23 00	21 00
Clear, except for flooring	30 00	27 00
Clear for flooring	1 00	
Clear V. G. No. 1 flooring	5 00	
Firewood	13 00	9 00
Dressed Pine, flooring, No. 1, 1x6	31 00	28 00
No. 1, 1x4	33 00	29 00
No. 1, 1¼x4, 1¼x6, and odd sizes	36 00	32 00
All sizes, No. 2	26 00	23 00
Stepping, No. 1	43 00	34 00
Stepping, No. 2	33 00	24 00
Ship timber and plank, rough	26 00	17 00
Selected, planed 1 side, av'ge 40 ft	28 00	23 00
" " 2 " " "	30 00	25 00
" " 3 " " "	32 00	27 00
" " 4 " " "	34 00	29 00
Deck plank, rough, average 35 ft	34 00	31 00
Dressed, average 35 feet	39 00	34 50
Pickets, rough, B. M	19 00	15 00
½x1½, 4 ft long, ₱ M	5 50	4 00

D. KABEEL of Santa Cruz has petitioned the Superior Court for a writ of mandate to compel the principal of the public school to receive his son, who was excluded because he was not vaccinated. This will test the constitutionality of the law passed by the recent Legislature, making vaccination compulsory for schoolchildren.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Argenta M Co	Nevada	19	10	July 20	Aug 21	Sept 16	E M Hall	314 Montgomery St
Alpha Con M Co	Nevada	3	25	July 15	Aug 22	Sept 12	C E Elliott	309 Montgomery St
Baltimore M Co	Nevada	5	25	July 2	Aug 5	Aug 24	A R Grim	401 Montgomery St
Baker Divide M Co	California	17	25	July 8	Aug 10	Aug 28	D M Kent	330 Pine St
Cadmus M Co	Nevada		20	June 3	July 18	Aug 19	J Craig	204 California St
Challenge Con M Co	Nevada	5	50	Aug 6	Sept 9	Sept 30	C L McCoy	329 Pine St
Chollar M Co	Nevada	27	50	July 15	Aug 20	Sept 10	C E Elliott	309 Montgomery St
Crocker M Co	Arizona	7	10	Jun 14	July 13	Aug 13	A Waterman	309 Montgomery St
Crown Point M Co	Nevada	81	50	July 9	Aug 12	Sept 2	J Newlands	329 Pine St
East Mt Diablo M Co	California	5	10	July 18	Aug 22	Sept 16	R W Heath	318 Pine St
Frue Con M Co	California	6	1½	June 11	July 18	Aug 10	J C Bates	434 California St
Golden Fleece G'v'l M Co	California	14	17	00	May 21	July 20	Sept 16	W J Gleason 306 Market St
Grand Prize M Co	Nevada	21	30	July 27	Aug 30	Sept 20	R R Grayson	327 Pine St
Kentuck M Co	Nevada	19	30	July 30	Sept 2	Sept 20	J W Pew	310 Pine St
Mexican M Co	Nevada	38	25	July 9	Aug 13	Sept 3	C E Elliott	309 Montgomery St
Mono M Co	California	28	50	July 24	Aug 23	Oct 1	B L Burling	309 Montgomery St
North Belle Isle M Co	Nevada	15	30	June 17	Aug 1	Aug 22	J W Pew	310 Pine St
Original Gold Hill M Co	Nevada	12	25	June 17	July 25	Aug 14	A W Barrows	303 California St
Overman S M Co	Nevada	60	25	July 27	Aug 30	Sept 20	G D Edwards	414 California St
Quartz Mountain M Co	California	21	40	Jun 17	July 22	Aug 15	E Hestres	217 Sansome St
Savage M Co	Nevada	73	50	July 19	Aug 21	Sept 10	E B Holmes	309 Montgomery St
Utah Con M Co	Nevada	7	25	July 9	Aug 13	Aug 30	A H Fish	309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING	DATE
Alta S M Co	Nevada	L Osborn	309 Montgomery St	Annual	Aug 15
Columbus Con M Co	Nevada	J M Buffington	303 California St	Annual	Aug 13
Independence M Co	Nevada	J W Pew	310 Pine St	Annual	Aug 19
Julia Con M Co	Nevada	J M Buffington	303 California St	Annual	Aug 13
Live Oak Drift Gravel M Co	California	J Morizio	328 Montgomery St	Annual	Aug 20
Martin White M Co	Nevada	A B Cooper	325 Montgomery St	Annual	Aug 15
Navajo M Co	Nevada	J W Pew	310 Pine St	Annual	Aug 13
San Joaquin Valley Coal M Co	California	F Bonacina	438 California St	Annual	Aug 15
South Feather W & M Co	California	A Halsey	328 Montgomery St	Annual	Aug 12
Union Con M Co	California	L H Barnard	402 Front St	Special	Aug 21

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Benton Con M Co	California	V B Allen	330 Pine St	Annual	July 31
Caledonia M C	Nevada	A S Cheminant	328 Montgomery St	08	Aug 5
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	July 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	July 25
Idaho M Co	California		Grass Valley	7.50	May 5
Navajo M Co	California	J W Pew	310 Pine St	10	Apr 1

Mining Share Market.

Trading in mining stocks the past week was quite active, with declining prices up to Tuesday, when a steadier tone set in, with a slight advance in the Comstocks at the afternoon session. This advance was maintained yesterday. The feeling was panicky for the week ending with last Tuesday, but well-distributed buying orders by the pool or their representative brokers prevented a general and disastrous break, yet values shaded off enough to clean up nearly every share of stock that was on a margin. Brokers called for money twice during the week to make margins good, and customers not responding were sold out without the least compunction of conscience. Those who were able either responded or else sold enough stock to take up their accounts. We dare say that there are fewer stocks on margin than ever before known, with prices as low as they are. The assessments falling due in this week, with more due soon and more assessments to be levied, are not the best of soothing syrups for a weak market, particularly when one broker firm suspends, a clerk in another goes off with considerable money, and last, but not least, sedulously circulated reports of other failures pending. Take it all in all, the past week witnessed more demoralized outside dealers than since the heavy break after the 1886 deal. The firm action of the north-end stocks, with Con. Virginia the leader, was the redeeming feature of the market. In outside stocks there was more trading, but at lower prices. Following the Comstocks the Tuscaroras fell off about 25 per cent, the Quijotoas 30 per cent, and Bodie 40 per cent. This latter stock, at break-neck speed, tumbled from $1.05 to 65 cents. The latter is the lowest price at which it has sold for several years past. The decline was due to an assessment levied on Mono, one on Bulwer, and a report of one to be levied before long on Bodie. This report being confirmed by the secretary of the company, caused many outside holders to let go—persons who bought a short time ago from $2.10 down to $1.40 a share on $5 points.

The market opened this (Thursday) morning weak and inactive.

From the mines our advices are still of an encouraging character, although they point to from four to eight weeks yet before actual results can be determined. While traders are watching the work going on in Con. Virginia, Best and Belcher and Ophir, well-informed miners look for better results in some of the middle and Gold Hill mines. The drift on the 500-foot level from the Yellow Jacket shaft is in Con. Imperial ground about 100 feet. It looks as if they are running for the ore deposit either toward or else in Alpha. The 1300-foot level drift from the Yellow Jacket shaft is in near the Con. Imperial line. Active and important prospecting work is going on in Yellow Jacket, Crown Point, Belcher and Overman, and also in all the middle mines. From the Tuscarora and Quijotoa districts reliable private advices are hard to secure, and in their absence we refer patrons to the official reports given elsewhere. From the Bodies our advices are still of a hopeful character. The work going on in the mines is reported to be of an active and important character.

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Hanauer, Aug. 1, $2160; Cons. California and Virginia, 2, $90,000; Hanauer, 2, $2100; Butte and Boston, 1, $31,862; Moulton, 1, $12,128: Hanauer, 6, $2700; Bluebird, 1, $14,820.

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	$ 6 75 @ 7 00	Cardiff	9 50@10 00
Liverpool St'm	7 50 @ 7 75	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	8 00 @ 8 50	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Gilman	8 00
Scotch Splint	9 00	Seattle	6 00
West Hartley	10 00	Coos Bay	5 00
Greta	8 00	Cannel	10 00
Westminster Brymbo	9 00	Egg, hard	17 50
Nanaimo	9 00	Cumberland, in sacks	19 00
Sydney	8 00	do, bulk	18 00
Jackson	6 00		

THE Argentine Smelting Works, six miles from Kansas City, were burned on Tuesday.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 17.		WEEK ENDING July 24.		WEEK ENDING July 31.		WEEK ENDING Aug. 7.	
Alpha	.90	1.10	1.00	1.15	.95	1.10	.75	1.00
Alta	1.20	1.35	1.30	1.45	1.25	1.30	1.30	1.30
Andes	.35	.65	.60	.65	.60	.65	.50	.60
Argenta	....	....	....	....	....	....	....	....
Belcher	2.60	3.00	2.80	2.95	2.35	2.85	2.15	2.55
Best & Belcher	3.10	3.90	3.45	3.80	3.10	3.60	2.70	3.15
Bullion	.65	.65	.65	....	.60	.65	.40	.60
Baltimore	....	....	....	....	.05	....	....	....
Belle Isle	.25	.25	.25	....	.25	....	.15	.20
Bodie Con	1.05	1.35	1.20	1.40	1.05	1.15	.70	1.00
Benton	4.00	....	4.00	....	4.50	....	....	....
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.30	.35	.30	....	.30	....	.15	.20
Commonwealth	4 10	4.30	3.95	4.30	3.95	4.10	3.05	4.00
Con. Va. & Cal	6⅞	7⅛	7	7⅛	6⅞	7⅛	6⅞	7⅛
Challenge	1.90	2.00	1.90	2.10	1.75	2.05	1.60	1.85
Chollar	1.40	1.60	1.45	1.50	1.35	1.50	1.10	1.35
Confidence	5⅞	5⅞	5⅞	6	5.50	....	6⅛	5⅞
Con. Imperial	.40	....	.40	.50	.40	.50	.35	.45
Caledonia	.20	.25	.20	.25	.20	....	.15	....
Con. Pacific	....	....	....	....	....	....	....	....
Crown Point	2.10	2.30	2.10	2.15	2.00	2.20	1.70	2.10
Crocker	.25	.40	.35	.40	.35	....	.30	.35
Central	....	....	....	....	....	....	....	....
Dudley	....	....	....	....	....	....	....	....
East B. & B	....	....	....	....	....	....	....	....
Eureka Con	1.00	....	....	....	1.35	....	....	1.50
Exchequer	.60	.65	.60	.70	.60	.65	.50	.60
Grand Prize	.85	.95	.75	.80	.50	....	.35	.45
Gould & Curry	1.85	2.20	2.00	2.10	1.80	2.00	1.60	1.90
Hale & Norcross	2.85	3.15	2.90	3.00	2.75	3.00	....	....
Holmes	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Iowa	....	....	....	....	....	....	....	....
Julia	.30	....	.30	.35	.30	....	.20	.30
Justice	1.35	1.75	1.70	2.15	1.35	1.80	1.30	1.55
Kentuck	1.00	1.00	1.05	1.15	....	....	....	....
Lady Wash	.35	.35	.40	....	.40	....	....	....
Locomotive	....	....	....	....	....	....	....	....
Martin White	....	....	....	....	....	....	....	....
Mono	.80	1.05	.90	1.00	.60	.70	.50	....
Mexican	2.75	3.10	2.85	3.00	2.50	2.95	2.15	2 60
Mt. Diablo	....	....	....	....	....	....	....	....
Navajo	....	....	....	....	....	....	.40	....
North Belle Isle	1.05	1.50	.95	1.15	.95	1.30	1.00	1.25
Niagara	....	....	....	....	....	....	....	....
Nev. Queen	1.60	1.80	1.35	1.50	1.25	1.30	1.00	1.30
North G. & O	....	....	....	....	....	....	....	....
Occidental	1.70	2.40	1.90	2.3	2.00	2.20	1.85	2.10
Ophir	4.35	5.00	4.55	4.85	4.25	4.65	3.75	4.20
Overman	.90	1.00	.95	1.00	.75	.90	.65	.75
Potosi	1.45	1.60	1.45	1.60	1.40	1.55	1.20	1.40
Peerless	.35	....	.35	.40	.30	.35	.25	.30
Peer	.15	....	....	....	....	....	.10	.15
P. Sheridan	....	....	....	....	....	....	....	....
Silver Star	....	....	....	....	....	....	....	....
Savage	1 60	1.85	1.65	1.80	1.35	1.65	1.15	1.40
S. B. & M	1.70	1.90	1.85	2 00	1.60	1.85	1.40	1 65
Sierra Nevada	2.15	2.45	2.25	2.35	2.00	2.30	1.95	2.15
Silver Hill	.45	.55	.50	.65	.35	.55	.35	.40
Silver King	....	....	.85	....	.85	....	....	....
Scorpion	.20	....	....	....	....	....	....	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	....	....	....	....
Union Con	2.80	3.15	2.85	3.00	2.60	2.95	2.20	2.60
Utah	.70	.75	.75	....	.65	.75	.55	.70
Yellow Jacket	2.80	2.90	2.80	3.00	2.60	2.90	2.30	2.65
	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY, Aug. 8, 9:30 A. M.

100	Alta	1.30	
200	Andes	60c	
100	Alpha	80c	
100	Belcher	2.20	
250	Best & B	3.15	
100	Caledonia	15c	
200	Commonwealth	3.15	
50	Challenge	1.45	
50	Caledonia	51	
250	Crown Point	1.85	
100	Con. Imperial	40c	
45	Con Va & Cal	7¼	
100	Exchequer	50c	
250	Gould & Curry	1.75	
100	Justice	1.55	
100	Mono	50c	
100	Mexican	2.35	
50	New York	40c	
100	Occident	1.90	
50	Potosi	1.25	
100	Silver Hill	40c	
100	Sierra Nevada	2.10	
50	Union	2.40	
150	W Comstock	40c	
150	Yellow Jacket	2.35	

A SIX WHEELED WAGON passed through Visalia recently. The body of the vehicle was about 20 feet long and had a heavy cover. The wagon was designed for the accommodation of campers, and was parlor and bedroom combined.

NEWSPAPER AGENTS WANTED.

Extra inducements will be offered for a few active canvassers who will give their whole attention (for a while at least) to soliciting subscriptions and advertisements for this journal and other first-class popular newspapers. Apply soon, or address this office, giving address, age, experience and reference.

DEWEY & Co., Publishers,
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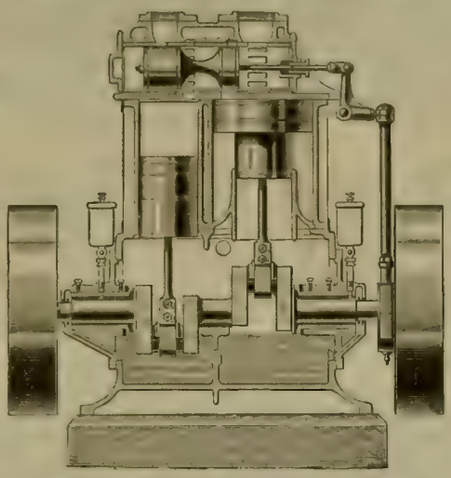
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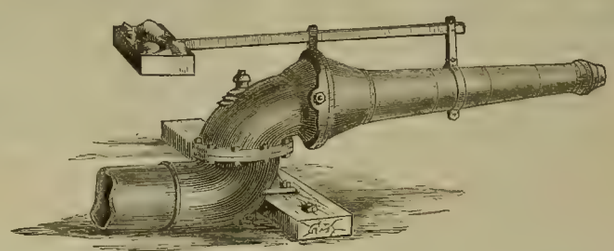
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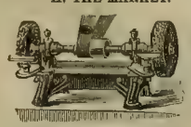
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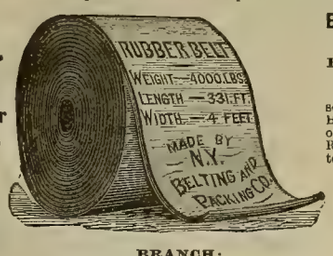
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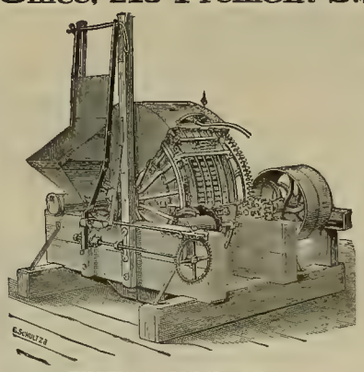
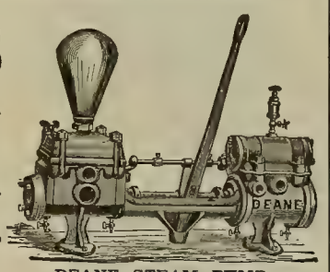
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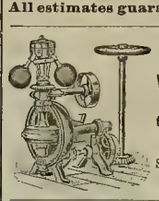
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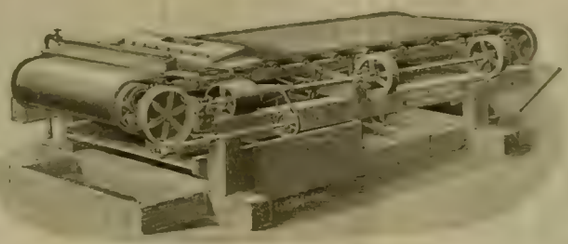
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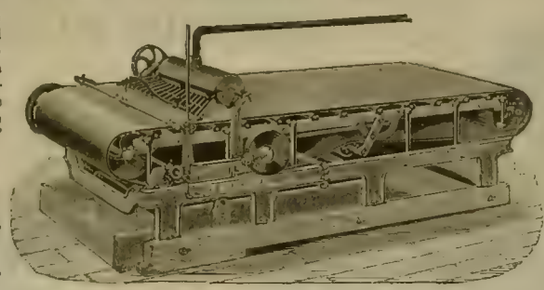
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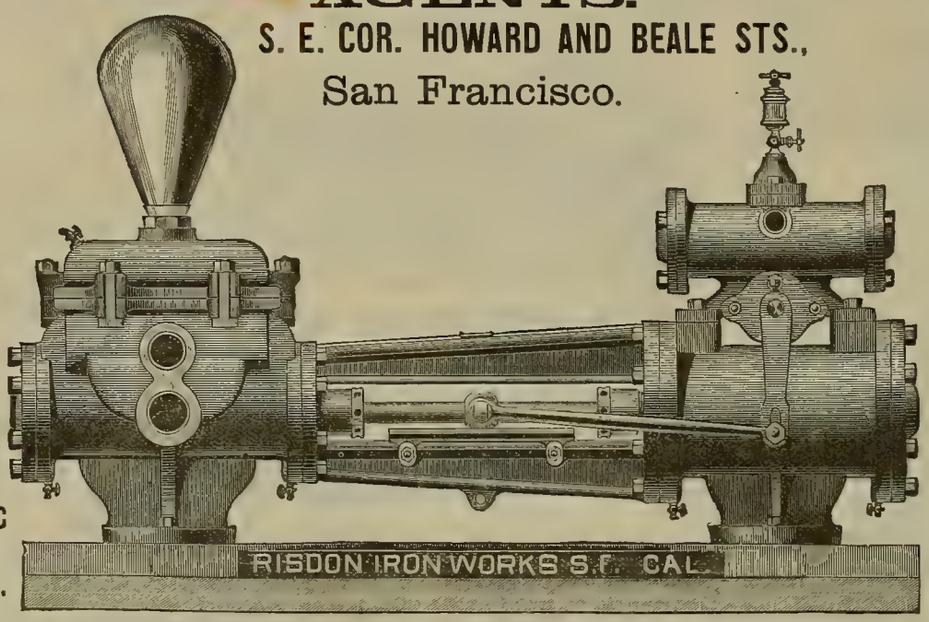
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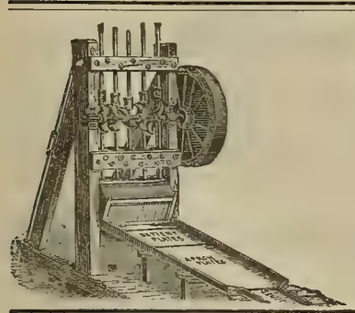
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DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, AUGUST 17, 1889.

Three Dollars per Annum
Single Copies, 10 Cts.

Hoop-Clamp for Large Tanks.

Mr. Asa R. Wells of this city has just obtained through the MINING AND SCIENTIFIC PRESS Agency a patent on a hoop-clamp which is specially adapted for use on large tanks, such as those used at railroad stations and at wine-cellars. The accompanying cuts show the device, the practical efficiency of which has been proven. *A* in Fig. 1 are the hoop ends, which are looped around the cylindrical outer ends of the heads *B*. The inner or adjacent ends of these heads are formed with hemispherical seats *b*, and in these are fitted hemispherical nuts formed with a rib fitting in a groove in their seats, whereby they are prevented from turning on that axis which is in the line of the adjustable bolt, while at liberty to move in their seats on an axis at right angles thereto. These hemispherical nuts are shown in Fig. 2 of the cuts.

Fig. 1.

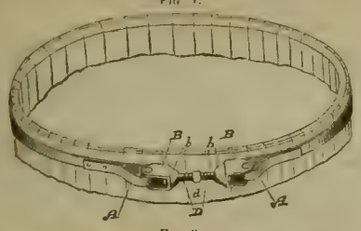


Fig. 2.

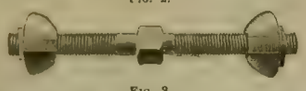


Fig. 3.



WELLS' HOOP-CLAMP FOR TANKS.

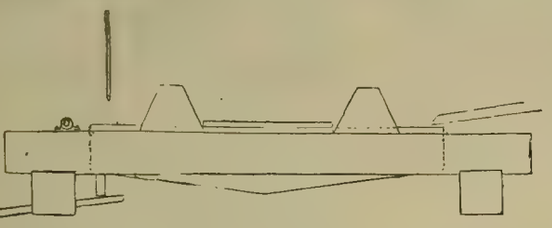
D (shown in all three figures) is the adjusting or tightening bolt of the clamp, having one end provided with a right-hand thread and the other end with a left hand thread, and at the center with a collar or wrench-hole, *d*. The threaded ends of this bolt pass freely through elongated apertures in the seats of the head and are seated in the hemispherical nuts in the sockets. An enlarged view is shown in Fig. 3.

The operation of the clamp is as follows: The ends of the hoops are looped around the heads as shown and then a wrench is applied to the central collar, *d*, of the tightening bolt. The bolt is turned, and as its reverse threaded ends work in and through their respective nuts the heads are drawn together, thereby tightening the hoop. The strain being in a curve, deflects the heads from a straight line, the hemispherical nuts through which the bolt passes turning in their hemispherical seats in the proper direction to enable the clamp to conform itself to the curvature of the hoop, thereby exerting its strength in the line of said curve instead of in a straight line tangential to it. As before mentioned, the nuts will remain steady in the direction of rotation of the bolt.

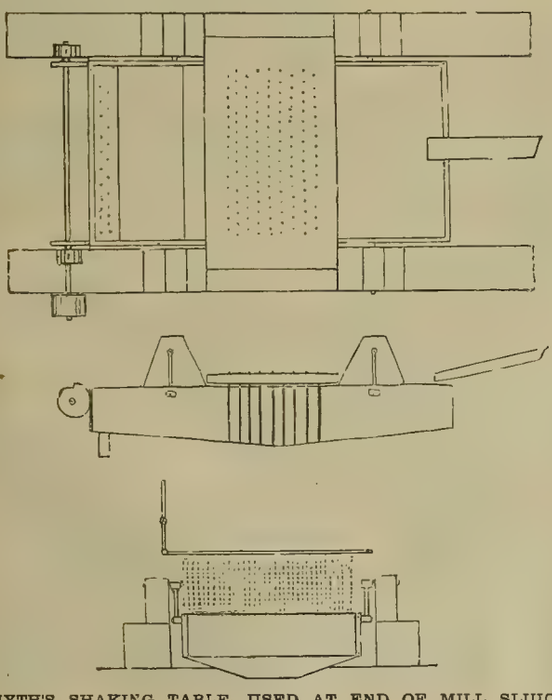
This invention supplies a great want, particularly in dry and hot climates, where shrinkage of lumber is considerable. No device heretofore in use for the purpose of tightening hoops has been satisfactory, for the reason that the draft was not straight and therefore not direct on the hoops. The advantage of a clamp hoop over a riveted hoop, particularly in heavy tank work, must be apparent to all. To tighten a riveted hoop requires tools, scaffolding and capable men. It also mars the paint and injures the iron. To tighten with a clamp, working freely, requires simply a ladder and a wrench in the hands of anybody.

Clamp bands are convenient in transportation; heavy bands for large tanks can be handled in sections without folding. Mechanically considered, the device may be described as a right-and-left draw buckle, acting on ball and socket joints. It therefore works equally free, powerfully and effectually on long or short draft and on large or small circles.

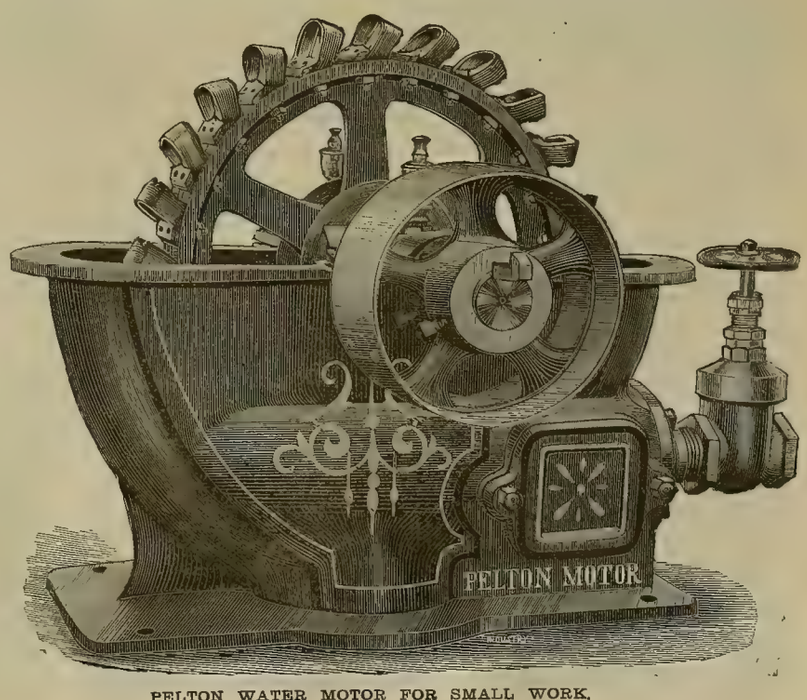
(*Continued on page 133.*)



THE STONE ELEPHANT OF INYO.—See page 128.



SMYTH'S SHAKING TABLE, USED AT END OF MILL SLUICE.
See page 128.



PELTON WATER MOTOR FOR SMALL WORK.
See page 128

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Plumas County Mines.

[From Our Own Correspondent.]

EDITORS PRESS:—Everywhere in Plumas county miners and farmers alike are speaking of the present condition of the debris question and the injunctions that rest like a pall upon their once prosperous county as thoroughly unreasonable and contrary to public policy.

With them they say it is very much as though the Sacramento valley was enjoined from plowing. Here is the little American valley, one of earth's garden spots, whose equal for hay, vegetables and certain hardy fruits can hardly be found. It was the dumping-ground for the debris for the leading hydraulic mines of the county, and yet it has done so little harm here that the farmers seem equally anxious with the miners for its continuance.

The writer has seen where great hills have been washed away and some canyons filled up, but very little good land injured. If these mines don't injure land in this valley, how can they harm the Sacramento valley, more than a hundred miles away? Yesterday one farmer said: "There is land that has paid me, many a time, more than $500 an acre for a crop of potatoes and other vegetables. Yet I told the hydraulic men to fire away with their monitors, as we had no market for the stuff and no use for the land when they were gone." In the river you can still see the same old bedrock that was bare in '49, and the same holes are there. How is it that those were not filled up if these mines have been damaging Yuba and Sutter?

The Edman Mine.

The Edman mine is situated on the Diadem lode four miles from Meadow Valley and a little more than a mile off the Quincy & Oroville road. It has a 300 foot shaft and tunnels at 45, 110 and 300-foot levels. There are 3000 feet of tunnels, besides sidings, stopes, etc. All this is timbered with heart of spruce sawed timbers 8x10 in the most substantial manner. Everything about the place is as neat as an old maid's parlor. But the main point is that several devices, apparently practical, were seen here that do not appear in use at other mines. The body of the ore is very soft and has a great deal of clay and slime mixed with it. At the mouth of the tunnel is a washing bin. Into this cars of ore are dumped and a small stream of water takes up the slime in solution and carries the ore down in sluices to the mill. This saves working not less than 50 per cent of the mass taken from the tunnel. Sulphurets predominate in much of the ore.

Huntington Mills

Of the capacity of 40 tons per day are used. For soft rock Mr. Edman thinks them far better than stamps, but they require special care, and many who make a success with stamps are not equally well pleased with the rollers. Speed should be regulated according to the rock. The harder the quartz the greater the speed. He would prefer the five-foot mill. He reports original cost of plant 30 per cent less than stamp mill of equal capacity, driving-power 25 per cent less and cost of maintenance the same. He reports cost of mining and milling, including superintendence and all items of cost, $1.90 per ton. On a large scale he estimates that cost of milling would be 80 cents per ton and cost of mining 75 cents. Maps, plans, figures, etc., indicate careful estimates. Richest rock carrying coarse gold is generally found in the footwall. Mass of milling rock averages $5 per ton. This company owns the Victor, Diadem and Red Point mines, all on the Diadem lode, and many placer claims, covering some 400 acres in all.

Greenville.

The Drury mine is working under efficient superintendence of Mr. G. Standart. They are running ten stamps and taking out fairly satisfactory rock. The writer saw several prospects taken from different parts of the tunnel and stopes, and every one showed gold.

The Indian Valley mine is soon to be started by its superintendent, S. R. Prentiss. Citizens are quite hopeful of business revival to follow the new work upon this mine.

At Crescent mills Mr. Whitney is running 16 stamps very vigorously upon hard rock brought up from a deep shaft. From these points we infer that the ore is good. The $4000 paid out monthly is certainly of great benefit to the place. A Burleigh drill goes in soon and 16 more stamps.

Green Mountain

With its splendid plant of 60 stamps lies idle a few rods up the hill from where Mr. Whitney is working so successfully. Residents report that this mine has command of a large body of ore, and that its tunnels and inclines are situated so as to enable it to work ore cheaper than any other mine in this vicinity.

It is remarked that mining superintendents are around the work in their brown duck suits more than formerly, and that mining is being carried on more like other business. When quartz mines are generally worked as carefully as a farmer must work his business to make it pay, it is thought that it will be possible to work many mines now idle. Careful, hard-working superintendents who will make rock pay that has not quite gold enough in for a bonanza fellow, are very popular here.

F. S. C.

Storage of Water.

State Board of Trade on Irrigation.

The interest taken by the State Board of Trade in the approaching visit of the Senate Committee on Arid Lands to this State has been frequently mentioned in the PRESS. A committee was appointed to prepare a comprehensive report on the condition and prospects of irrigation in California. This report has been prepared, and after revision by Mr. Estee and Gen. Chipman as a sub-committee has been given to the printers. The following is a synopsis made by the *Call* from the manuscript of the report:

The questions presented are:

What is the physical condition of California, so far as it relates to irrigation?

What amount of irrigable land is there in the State?

What amount of water can be obtained for the purpose of irrigation?

What are the advantages of irrigation?

In this connection, does irrigation pay?

What is the condition of irrigation as at present practiced in California, and what interest has the National Government in the subject of irrigation on the Pacific Coast and in relation to all that extent of country known as the "arid region," which lies west of the Missouri river?

Physical Condition and Adaptability.

California lies between the thirty-second and forty-second degrees of north latitude; it has a coast line of over 900 miles, and in width is from 150 to 200 miles, and has an area of 157,801 square miles. Two ranges of mountains extend north and south through the whole length of the State. The Coast Range, which lies just back of the ocean, parallels its shore line from one end of the State to the other. In some places this range of mountains rises in hight to from 4000 to 6000 feet, and is cut up in every direction with small but fertile valleys, fed by canyons which carry living streams of water, flowing both inland and to the sea.

The other range is the Sierra Nevadas. Its sides are covered with timber and its summits with perpetual snows. Its average hight is about 8500 feet, while Mount Shasta, in the extreme northern end of the State, rises 14,400 feet above the level of the sea; Lassen Peak, 10,577 feet; Mount Whitney, 15,000 feet; and Mount San Bernardino, 11,600 feet. Along the Coast Range the rain is excessive in winter and heavy fogs prevail during the summer months.

In the Sierra Nevada Range there has fallen as much as 80 inches of water in a single season. The depth of snow in winter averages from 8 to 20 feet.

Between these two mountain ranges is the valley of the Sacramento and the valley of the San Joaquin. They are in width from 30 to 75 miles, and their combined length is 450 miles. South of these lies another of surpassing beauty, which extends through the whole length of Los Angeles and San Bernardino counties, and in which irrigation has recently been largely and most successfully introduced.

Topographical Advantages

Will be noted when we observe that nearly every stream heading in the Sierra Nevada mountains comes from the snow belt and is supplied by the melting snows, which continue until July or August of each year.

The two great valleys before referred to are almost on a sea level. Sacramento, 89 miles from San Francisco, has an altitude of 30 feet; Bakersfield, in Kern county, distant from San Francisco 314 miles, is 282 feet above sea level. Redding, 299 miles from San Francisco, has an altitude of 556 feet. In these plains is very little rolling land, and the advantage for irrigation is great. This condition extends from Mount Shasta to Tejon Pass, a distance of 500 miles. The two valleys of the Sacramento and the San Joaquin cover an area of about 12,000,000 acres of irrigable land. The drainage is effected through the Sacramento and San Joaquin rivers.

Facilities Within the State

Is the most vital question we have to consider, because, however much irrigation may be needed in this State, if there is not an ample supply of water, it would be more than useless to attempt to carry on any extensive system of irrigation. Owing to the peculiar topographical situation of California, and the fact that for over 900 miles it borders on the Pacific ocean, the great ranges of mountains before referred to and their high altitude, there are a large number of living streams of water flowing from both these ranges of mountains into the valleys below, and which makes the water supply most abundant. Two of these streams are navigable rivers—the Sacramento for 200 miles and the San Joaquin for 100 miles. On the extreme southern boundary of the State is the Colorado.

Streams That May be Utilized.

The principal rivers that flow into the Sacramento from the east are the Feather, Yuba, Bear, American and Cosumnes rivers; there are a large number of smaller streams which head in the snow belt of the Sierra Nevada mountains, flow through the foothills across the Sacramento valley, and empty into that river. On the west side of the Sacramento valley no large rivers are tributaries, but there are a large number of creeks. Among the larger of these streams are Putah, Cache, Stony and Cottonwood creeks.

The San Joaquin valley is watered by a number of rivers. Among these are the Mokelumne, Calaveras, Stanislaus, Merced, Tuolumne, San Joaquin, Kaweah, Kings and Kern rivers. The combined water-shed of these rivers is 38,500 square miles.

The Mojave river can be successfully used for irrigation on the Mojave desert. The Mojave desert is a desert only in this sense: there is not rainfall enough to make grass and crops mature, but the soil is rich, the climate genial, and with water almost anything will grow with luxuriance. South of this is the Colorado river. It borders the Yuma desert. Wherever water has been applied on this desert the soil has proven productive. Much of this desert is below the level of the river, and some of it below sea level; and bringing water upon it would make this one of the most fertile places in the world. It is estimated that this river will successfully irrigate 1,000,000 acres of land.

The Rainfall.

The average annual rainfall at San Francisco is 23 5 inches. In the foothills of much of Northern and Central California the average rainfall exceeds 30 inches, increasing as you go north from the lower part of the San Joaquin valley, where it is about seven inches, until you reach the upper end of the Sacramento valley, where the annual rainfall is 35 inches. At San Diego it is 9.2 inches. In California fair crops can be raised from a rainfall of from 10 to 12 inches, if it comes at the right time. The annual rainfall is not uniform one year with the other.

To illustrate: At Fort Redding, one year the rainfall was 37.4 inches, the next year it was 15.9 inches. At Sacramento the rainfall one year was 27.9 inches, while the next it was but 12 inches. At Fort Tejon one year it was 34.2 inches, the next year it was 9 8 inches. Clear Lake had one year a rainfall of 66.7, and next year only 16.2 inches. Visalia one year had 10.3 inches of rain, the next year but 6.7 inches.

In the coast counties north of Monterey there has never been a failure of crops. South of Monterey, for the years 1868, 1869, 1870, and 1871, there was a noticeable drought; stock-raisers were compelled to drive their stock to the mountains or drive it north. From Tulare to San Diego in 1871 the country was almost barren of verdure. Except in favored localities there was no grass for stock; thousands of sheep, horses and cattle were lost.

Irrigable Lands.

According to survey, the area of land in California which may be readily irrigated is about 7,650,000 acres. This does not include the so-called swamp and overflow lands. But should we include these and the low foothills, there would be about 12,000,000 acres of irrigable land in the State. We should now add 1,000,000 of acres to the above estimate, which would include Mojave and Yuma deserts, Sierra and Honey Lake valleys, making 13,000,000 acres of irrigable land in California.

The area of watershed outside of the lands to be irrigated is estimated at about 3½ square miles to each square mile of land to be irrigated.

Results of Irrigation.

Los Angeles and San Bernardino counties are conspicuous illustrations of what irrigation can accomplish. The population has more than quadrupled in a single decade; lands which sold ten years ago at from $5 to $25 per acre now sell at $100 to $1000 per acre. In Placer county water has for some years been used for the irrigation of orchards and vineyards. Orchards of every variety of fruits and vineyards of every variety of grape, and nuts of all varieties, the fig and olive, all flourish in the foothills of Placer county.

The foothill country about Oroville, where water has been introduced, is no less conspicuous for its luxuriant tree growth. Within the last four years 1500 acres of orange orchards have been planted, and these trees seem to be thriving well. Fresno, once a veritable desert, is now a garden of luxuriance and beauty. Within the past few years a town has been built, which has a population of over 10,000.

Ten years ago the lands of Fresno sold at from $3 to $20 per acre; now the same land, with water on it, sells from $75 to $750 per acre, all due to irrigation. Kern county is another conspicuous landmark; more than 80,000 acres of land is being irrigated in that county.

Everywhere in California during the summer months garden vegetables are raised by irrigation. In the fall, winter and spring months in most parts of the State they require no irrigation, except such as they get from the natural rainfall. So with strawberries; this fruit is universally irrigated. In Santa Clara county alone it is claimed there are 1500 acres of land cultivated in berries, all of which are irrigated; and that there are over 500 acres cultivated in garden vegetables, which are also irrigated. Even in northern counties like Napa, where the annual rainfall is almost three times as great as in some parts of Southern California, yet strawberries, other small berries and garden vegetables during the summer months are universally irrigated.

Irrigation in Northern California.

The Sacramento valley contains large areas of bench lands, lying above the bottom lands of the river, in Shasta, Tehama, Butte, Colusa and other counties, all within reach of the water flowing down the Sacramento river and its tributaries. The creeks flowing from the Sierras are generally constant and unfailing, though diminishing in quantity through the summer.

Nature has built a reservoir in Lassen county called Eagle lake, covering an area of 35,000 acres, and in many places over 1500 feet. A tunnel 7000 feet long would tap the lake 12 feet below the surface, and by an additional open tunnel of like length the lake could be tapped 20 feet below the surface. It has a watershed of 400,000 acres in the regions of our heaviest rains and snowfall. Its elevation is 5115 feet.

Willow creek was probably once its outlet and through subterranean passages now receives its first escaping waters. This creek runs through Willow Creek valley and into Honey Lake valley.

The Susan river has a watershed separate from that of Eagle lake and about as large. It flows into Honey Lake valley; very fine storage sites are to be found near the source of this stream.

The irrigable lands of Lassen county are not far from 500,000 acres, and east of these lands in the State of Nevada is an area of like extent. The lands are rich, sandy loam, productive with water, but comparatively useless without. Here there is a region of nearly or quite 1,000,000 acres of public lands capable of sustaining a large population.

A rough calculation shows that in Eagle lake there is already stored enough water to irrigate 500,000 acres of land, and at the head of Susan river comparatively cheap reservoir sites are available to store water sufficient for a half million acres more.

North of this region lies Madelin plains, a large area of good lands if irrigated.

In Modoc county like areas are lying idle and useless, yet capable of high cultivation and sustaining a large population.

Owens Valley in Inyo County.

Inyo county is especially adapted to irrigation, particularly Owens valley. From Olancha to the head of Round valley, 100 miles, a strip of country from four to six miles in width is susceptible of irrigation. There are from 300,000 to 400,000 acres of land entirely worthless without the use of water. The Owens river carries during the summer months water enough to place at least a surface depth of 15 inches upon an area of 300,000 acres of land, without preparing catchment reservoirs. Less than 12,000 acres of land are now cultivated in Owens valley.

Los Angeles and Orange Counties.

In Los Angeles and Orange counties the length of the ditches is hundreds of miles, irrigating many varieties of soil and crops. The area of actually irrigated land in the two counties is in the vicinity of 150,000 acres. The sources of the irrigating water supply of these counties are the rivers Los Angeles and San Gabriel in Los Angeles county, the lower part of the Santa Ana in Orange county, the upper part being in San Bernardino county, and many creeks and small streams whose flow is of short duration, springs and springy lands, and hundreds of artesian wells. The rivers, except the Los Angeles, rise in the high mountains. Their waters disappear soon after debouching from the mountains, but they reappear at intervals all the way to the sea, and can be taken out at almost any point along their channels by simply running ditches into them. The average summer flow of the San Gabriel river is about 10,000 inches; that of the Los Angeles river is 3750 inches, and that of the lower Santa Ana 4000 inches. During the usual three months of the irrigating season the water is all appropriated, but much is wasted, both by seepage and evaporation, and much is allowed to run to waste. A great deal of water is obtained from springs and springy lands. The most notable instances of these sources of supply are the springs and marshy lands of Pomona, Santa Anita and San Gabriel, the marsh lands of the Rio Honda and Paso de Bartola, and those at the head of the Los Angeles river on the San Bernardino plains.

Artesian Wells.

Pomona orchards are largely supplied by them; so are those of Santa Anita and San Gabriel valleys, while the lower coast plain has hundreds of such wells. They have an average bore of six inches, depth of 150 feet and a flow of two inches. Not more than one-third of them, however, are flowing—that is, about 1500.

The Facilities for Storage.

The storage of water in the canyons may be effected by throwing dams at favorable places across the mouths of such canyons or basins as have the least wash and afford the largest capacity, and possibly of leading the water into them from adjacent streams.

Reservoirs on the bench lands may be constructed by excavating, and at much less expense than those in the canyons, and be of much safer character. There are a number of reservoirs of both kinds, of capacity varying from a few thousand to a billion gallons. One on Mormon creek is of more than the latter capacity.

The waters of the San Gabriel river would suffice to irrigate all the great valley below, coast plain beyond and the intervening range of hills to their very tops. The waters of Millard canyon and the Arroyo Seco could be made to flow over the San Rafael hills and those in and adjoining East Los Angeles. So with the San Dimas, the Santa Anita, Eaton, Tejunga, Pacoima, San Fernando, Mormon creek, Verdugo and Santiago, whose flow in the aggregate is enough to supply all the lands between them and the ocean many times over; also the Mojave, where most of the land still belongs to the Government; Big and Little

Rock creeks, Oak creek and some others, most of which show surface water only in the rainy season, if those waters are husbanded, as there are abundant facilities for doing; and in the Newhall region, the Santa Clara, the San Francisquito and the Castaic may be made to greatly increase the productiveness of the valley and the wealth of the county.

The number of acres of good land which require irrigation is, south of the mountains, 460,000. North of the Sierra Madre range, Los Angeles county shares with Kern and San Bernardino in the great Mojave desert. In these three counties, one-half of this is probably arid beyond redemption; one-half of the remainder is too rough and mountainous to be valuable for cultivation, but the remainder is mostly highly fertile soil, lying favorably for the application of water. Of this vast territory Los Angeles county possesses 250,000 acres which can be made to comfortably sustain a population of 100,000 people.

It is stated that the lowest summer flow of the Mojave river is about 5000 inches. The average flow for six months in the year, the winter and spring months, is 20,000 to 30,000 inches; during May, June and July more than 10,000, and for the rest of the season more than 5000 inches. Of this the Hesperia Land and Water Company has filed a claim of 5000 inches. The Hesperia Company irrigates about 300 acres of land, and is flooding 15,000 acres for the purpose of preparing it for cultivation with the use of less water than it would otherwise require; the remainder, properly cared for, will redeem a half million acres of now absolute desert.

Sites for Storage Reservoirs are Abundant.

The land is mostly Government land and the profits thereon would pay for enormous and elaborate works. Big and Little Rock creeks, which debouch upon the desert plain at higher elevation west of the Mojave river, are wholly within Los Angeles county. Their flow in winter is thousands of inches, and in summer is sufficient, as at present handled, to irrigate several hundred acres. Facilities for storage on these creeks are as abundant as on the Mojave. It is capable, under irrigation, of producing luxuriant and profitable crops. Artesian well-boring has proved successful in places, but the expense is great. We have an engineer's report with regard to Little Rock creek. He finds ample winter flow to furnish irrigation water, if stored, for 270,000 acres, allowing one inch to five acres. He allows for 30 inches of evaporation and finds sites and gives estimates for two reservoirs, the larger one having a capacity of 644,000,000 gallons, and to cost $125,000. There is reported from the same locality 800 acres to which water is applied; 200,000 acres irrigable, one-half of which belongs to the Government; 14 miles of ditches. Value of irrigable land, $50 per acre; non-irrigable land, $1.15 per acre; the number of artesian wells in the region, seven, with an average depth of 340 feet and average flow of 12 inches. The counties of Los Angeles and Orange have an area of 4812 square miles, or 3,079,680 acres. Their population is fully 150,000 souls, and there are nearly 90,000 acres of good land that requires no irrigation.

The land now irrigated is about 150,000 acres, and this is the basis of maintenance of 113,000 people.

Former and Present Population.

Ten years ago the population of the counties was little over 30,000. Fifteen years ago the land on which Pasadena now stands was held at $7 per acre; in seven years it was valued and sold in large quantities at $500 to $1000 per acre. This was for orchards made possible only by a supply of moisture for the roots of the trees during the long arid season of the year. So with the great foothill region along the base of the Sierra Madre range from Tejunga and Crescenda Canada on the west through Altadena, Sierra Madre, Lamanda Park, Santa Anita, Monrovia, Duarte, Azusa, Glendora, Alosta, San Dimas, Lordsburg, Cucamonga, Rialto, Redlands and over the San Gorgonio pass into the desert at Indio, and again at Riverside and Arlington and places too numerous to mention. The region mentioned was almost worthless, and was as incapable of sustaining a population as the Mojave desert.

The remainder of the report treats of the different localities throughout the State that have been reclaimed; the manner in which the water was gathered and stored; the manner in which it was distributed and the amount required per acre in different portions of the State, taking evaporation, seeping and other losses into consideration; the value of water-rights and the division of shares; the value of storage reservoirs; artesian wells; value of irrigated lands; irrigation in certain sections a necessity; statistics showing the amount of arid lands in districts; temperatures; the interest of the National Government in irrigation—these and kindred subjects are treated in an exhaustive manner, giving information with reference to everything connected with irrigation.

PASTEUR'S METHOD IN CHICAGO.—Dr. Legario of Chicago, who spent five years at Paris as a student of Pasteur, is treating patients for hydrophobia at the county hospital according to Pasteur's method.

CENTRAL ASIA will soon boast of having the electric light, Russian engineers being busy with installations at Bokhara, by order of the Emir.

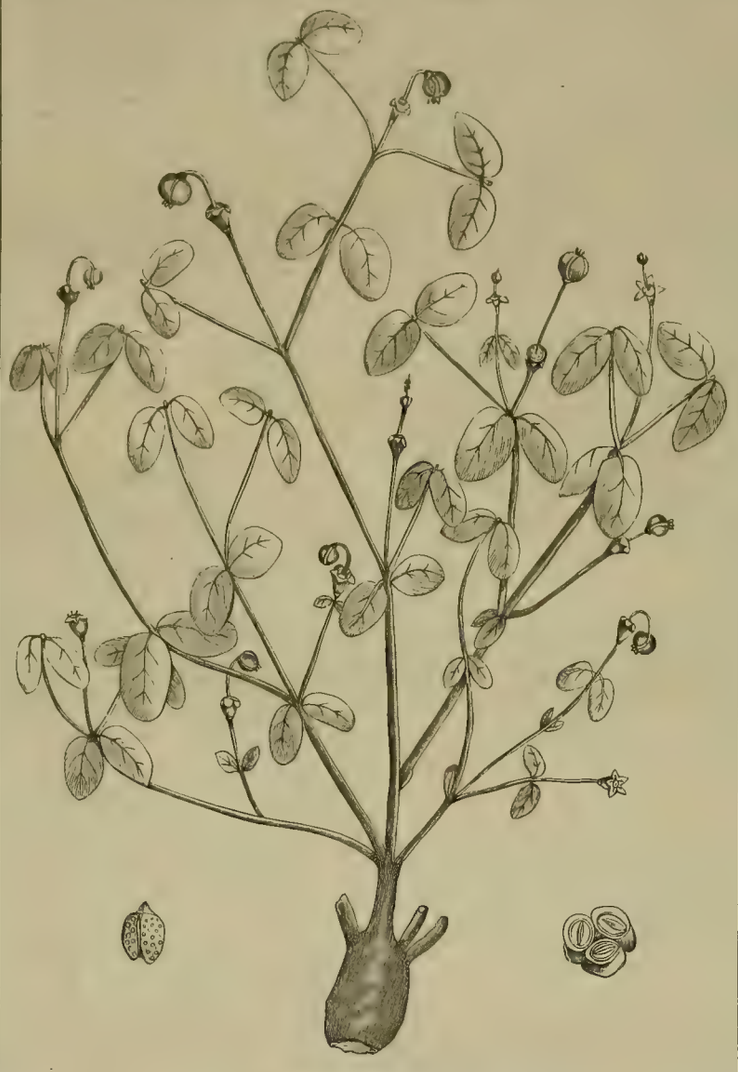
The Northern Counties of California.

NUMBER 9.

Salt Springs.

[Written for the PRESS by JAMES H. CROSSMAN.]

In these northern regions salt springs are not uncommon. Many of them contain a high percentage of saline matter (chloride of sodium) remarkably free from alkaline impurities. On several of them expensive evaporating works have been erected, and previous to the advent of the Oregon & California railroad the home market was supplied from this source. With the march of improvement, the "prairie schooners" and patient pack-mules were replaced by the "iron horse;" transportation and freight rates were reduced to so low a figure that the foreign product came strongly in competition with the domestic. These manufactories were in consequence closed, artesian wells plugged and flowing saline springs allowed to run to waste, saturating the soil and forming



AMERICAN IPECAC—Euphorbia Ipecacuanha.

what the frontiersman, trapper and hunter know as "deer licks."

In Siskiyou county the most extensive and

Largest Manufactory

Of this crystalline product was that of T. J. King, which was established in 1860. He discovered a flowing salt spring of considerable density in Shasta valley on the banks of the Shasta river, in Tp. 44, N. R. 6 W., in the vicinity of what is now known as Montague Station on the O. & C. R. R. He proceeded to utilize his find by the erection of evaporating works, using what is known as the "German system."

The plant consisted of engine, boiler and pump of sufficient capacity to raise the water of the spring high enough to distribute it over the surface of a pyramid composed of sagebrush 110 feet long by 10 feet wide at the base by 6 feet at the top by 16 feet in hight. It was built on a sloping platform 20 feet wide, which was set on a sidehill at a sufficient elevation to place a similar structure below. The natural water of the spring thus elevated and distributed, slowly trickled through the interstices of the brushy mass, while a constant circulation of the heated and rarefied air that regularly blows during the summer months in this region, caused a rapid evaporation, the saturated saline water falling on and flowing from the platform into a trough, thence to another and similar pyramid where the same process was repeated. Thence it went to a tank and from the tank was drawn off to pans, when the work was completed by artificial heat, and the commercial product ready for the market without other refining process. The demand for this product being greater than the supply in 1872, the proprietor, Mr. King, decided to increase his works by boring for a greater

Artesian Flow.

He erected the ordinary plant, using a 4½ inch bit with which he sunk through the several strata illustrated in the section presented on page 133, and at a depth of 107 feet, tubed his well. At this point the water contained one per cent of saline matter. His object in tubing was to prevent the admission of extraneous matter other than that encountered in the regular order.

At a depth of 356 feet thermal water was encountered with a jet four feet above the well-curb, showing an increase of pressure head as well as of saline matter. At 409 feet the flow increased to 143,995 gallons daily, pressure head increasing. The drill was thrown out. In the pressure-test tube the water raised 16 feet above the curbing. The flow was constant, showing increased pressure, and at a hight of 30 feet in the tube the flow was spasmodic and intermittent, demonstrating that the maximum pressure-head point had been reached and that the water had found its level. At 426 feet the drill sinks through a subterranean channel, resulting in a strong flow of both water and natural gas, with a water-jet five feet above the curb. The saline density, as shown by hydrometer, was four per cent. At a depth of 490 feet the drill enters another subterranean channel, where we reach the maximum pressure head and flow of water as well as the maximum flow of natural gas. This gas when ignited burned fiercely until extinguished by a gale of wind. The water overflow was covered with an oily scum that also took fire, covering it with a sheet of flame.

The drill then bored deeper through 118 feet of amygdaloid, the water gradually losing its saline properties. At 665 feet a bed of magnetic iron was encountered of so strong a magnetic power as to adhere to the drill; and at 696 feet the underlying or bedrock formation was reached. The daily flow of water at this point was 150,000 gallons, but pure, soft, and free from all mineral substances. Of the correctness of the above statement there can be no question. It was taken from the record-book of the work as it progressed, kept by Mr. King, the owner of the well.

This gentleman furnished the data and contributed to the California State Mining Bureau samples of the strata that were cut by the drill. The above data is of importance and of great interest to the scientist, student, farmer, merchant and manufacturer, particularly so when it is known that the western boundary or rim-rock of the Shasta valley basin, as it dips easterly under the surface, is overlaid by a sheet of carbonaceous shale five feet thick, in which seams of a good quality of lignite (coal) occur. The shale lays at an angle of from five to eight degrees, dipping into and under the basin. Strong evidences have been found of a coal measure of value on which an incline has been sunk to a depth of 45 feet, when the influx of water from want of proper machinery caused a cessation of work. The artesian well, of which we publish a section, was not bored in what was believed to be the center of the basin. What other wells might do is a problem that will be solved at some future day.

Shasta Valley

Of Siskiyou county is situated at an elevation of from 2500 to 2600 feet above the level of the sea. It is from two to five miles in width easterly and westerly, with a longitudinal extension from north to south of about 15 miles. It is bounded on the east by that lava-covered range forming the plateau known as the lava-fields, and on the west by a low mountain range which at the point where the strata dip under the valley is composed of a silicious rock (quartzite) dipping east, while the strata bounding the valley on the east dip west and into the valley, thereby forming a basin-shaped depression filled with the several strata of subsoil, sandstone, etc. Some of this is fossiliferous, containing fresh water and marine shells as illustrated in the section.

The deep subsoil has been largely formed from the decomposition of the eruptive and volcanic rocks that bound it on the east, which contain alkaline minerals that possess wonderful fertilizing properties. These, when applied on the soil, produce heavy crops of the cereals. Lands thus treated are particularly noted for their yield of succulent grasses, alfalfa, timothy, etc., affording pasturage and feed for a large number of both horses and cattle the year round. These lands are particularly adapted for dairy purposes. The butter manufactured in this valley is of a superior quality. The color is golden and the flavor aromatic and agreeable to the taste. It compares favorably with the celebrated Goshen of the Empire State. The valley is not subject to the extremes of heat and cold, and is capable of supporting a large population. On the Klamath river the

Detrick Spring

Has also been a producer. It is situated two miles from the river in a formation of blue sandstone and micaceous schist. It affords a steady flow of two miner's inches. The hydrometer shows five per cent of saline matter. The system adopted for evaporating is the "Brush" with evaporating-pans. Within a circumference of one mile, ten saline springs come to the surface. The salt manufactured at these springs is sold on the ground for one cent per pound and is extensively used for dairy purposes, being a pure chloride of sodium and free from all impurities. Siskiyou possesses other localities of lesser note where saline springs occur.

Other Resources.

Del Norte and Modoc are also well supplied with perennial saline springs, while Humboldt and Mendocino counties contain a belt of country near their shore lines, of undetermined width, in which occur not only numerous springs of saline and medicinal waters, both hot and cold, but large areas of hydrocarbonaceous fields that contain petroleum, asphaltum and natural gas, as well as sulphur and coal. These sources of mineral wealth are entirely undeveloped and their great value but little understood by the owners on whose lands they occur. Their attention is as yet almost wholly directed to the manufacture of lumber from the immense forests of redwood that occur in this region, and other industrial pursuits incidental to this business. Mining, as an industry, for gold and minerals of an economic value, is let severely alone. The mineral resources of the earth are neglected for its vegetable products. There is no portion of our State where a detailed geological and mineralogical survey is more needed and more beneficial than in this locality.

American Ipecac.

Two species of *euphorbia* share the name "wild ipecac." One of these, *E. ipecacuanha*, is shown on this page, the engraving being a reproduction from Dr. Vasey's series of medicinal plants, published by the Department of Agriculture. This latter species is most often given the distinctive appellation "American Ipecac." Both species are herbaceous perennials. The former ranges over the country east of the Rocky mountains; the latter is confined to sandy woods and shores near the sea coast from New Jersey to Florida. According to Dr. Vasey's description, the *E. ipecacuanha* sends up numerous slender stems from a thick, irregular root, which sometimes penetrates several feet in the sand in which it grows. The stems are erect or procumbent, smooth, from six inches to one foot long, and fork or divide in twos several times. The leaves are very variable in size and form, being sometimes narrowly linear, sometimes oblong or obovate, and from half an inch to an inch and a half long; they are opposite, sessile, smooth, and entire. The flowers are single, on peduncles an inch or more in length, proceeding from the forks or axils.

Like all the species of the genus *Euphorbia*, the stems abound in an acrid, milky juice.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SUTTER CREEK.—Cor. Amador *Ledger*, Aug. 10: The concentrators at the additional stamps to the Wildman mine are of the Triumph make, with the Blaisdell belts, which have a corrugated surface which is thought by many to have an advantage over the smooth surface. There will be an expert put on each concentrator in a few days for a run of a month, so as to make a very thorough test. Sinking at the North Star is about finished. They have attained a total depth of over 800 feet, and have the sump to sink yet, after which drifting will be inaugurated. Most likely they will drift in an easterly direction first, and if the result does not prove satisfactory the footwall will be tried.

MINE SOLD.—*Ledger*, Aug. 10: The Mandich Bros. & Leggett sold three claims this week to Jas. Treadwell and Geo. Pickett of San Francisco, for the sum of $6000. These claims are located near each other, about six miles above Sutter Creek. One of these was bonded to S. D. R. Stewart last year, who put up a six-stamp mill and other improvements. A boulder appeared in the ledge which failed to show gold in paying quantities, and Mr. Stewart shut the whole thing down and forfeited the property at the expiration of the bond. The Mandich boys then went to work on it and after extending the tunnel a short distance, the pay ore came in again. The new purchasers examined into the property thoroughly before buying, and were fully satisfied of its value. They are both mining men. Mr. Treadwell at one time owned the famous mine on Douglas island, Alaska, now running 240 stamps, and which was named after him. They intend to develop the Mandich mines in good shape, without delay. A tunnel is to be run at a point considerably below the present tunnel, so as to tap the ledge 250 feet from the surface.

MISCELLANEOUS.—The Plymouth Con. is practically closed for the present. They are keeping the water down, and that is about all that is going on about the works. No one seems to be able to give any definite information regarding the alleged cave. There is some talk that it is the intention to take down the new part of the Pacific mill—the last addition of 40 stamps—and ship the same to Mexico. It was also reported that a winze was to be sunk in one of the lower levels of the Pacific in search for further pay ore. Altogether the affairs of this property seem to be considerably mixed, and parties interested, whether in New York or on the ground, appear to be in blissful ignorance as to the present or future operations of the company. The water for some cause or other is short at the Bunker Hill, and all the men are laid off except a few repairing the shaft. The South Spring Hill is only running 10 stamps and the Keystone 20, the water not being sufficient to run full blast. A party from San Francisco has been surveying the Kling claim for the past few days. It is understood it will be sold pretty soon.

Calaveras.

COPPEROPOLIS.—Calaveras *Prospect*, Aug. 10: At the Union copper mine 75 men are employed at present, and more hands will be put to work as soon as the shaft that caved some time ago is cleaned and retimbered. About one-third of the work of retimbering has been completed already. While the work of overhauling the machinery on the several shafts, retimbering, etc., is going on, the low-grade ore is being removed from the dumps to leaching floors, about 3000 feet from the mine. There is a noticeable revival in business in the town of Copperopolis.

Inyo.

THE OLD DOMINION.—Inyo *Index*, Aug 7: Such is the title of a well-known mining property of Beveridge district, and was formerly known as the Borago Broncho. It belongs to ex-County Clerk Hunter and Thos. McDonough, both gentlemen being Cerro Gordo miners from 'wayback in the middle 60's, and is situated just across the summit of the three highest points of the Inyos. The ledge is situated some six or seven miles south of the noted Keynot mine, and nearly the same distance north of the great argentiferous-galena deposits of Buena Vista peak or Cerro Gordo. The Borago Broncho was originally opened by an incline shaft to a depth of 70 feet, and steam arastras were put up for handling such part of the ore that contains gold free to the amalgamation process. Mr. McDonough's developments this season, at a point comparatively on the surface, are, however, the most important. It is a mass of ore and matrix full eight feet wide. A shipment to Melrose of eight tons of the ore is expected to show up $100 per ton in gold.

MAXIM.—Inyo *Independent*, Aug. 10: On Thursday Mr. McConnell and others went out to the Maxim to start the mill. When they arrived there they found Arthur Smith and Neil McLean in possession of the premises, who informed Mr. McConnell that they intended to hold the same until their wages were paid. After some dispute their claims were settled and McConnell took charge of the works. There is considerable ore on hand to work.

CERRO GORDO.—As was stated in last week's issue, the sale of the Union mine at Cerro Gordo has been effected and operations will soon be commenced there.

WATTERSON'S NEW MILL.—Inyo *Register*, Aug. 10: As mentioned heretofore, Geo. Watterson is putting up a small quartz-mill for gold ores near the lower end of Long valley on the east side. Chas. Wonacott has the work in hand, assisted by Chas. McKay and Woodworth of this place, who have just gone up for that purpose.

Mono.

MONO.—Bodie *Free Press*, Aug. 12: During the past week south drift from joint winze from south drift, 1000 level, was driven 20 feet. Southwest drift, 1200 level, was advanced 10 feet. West crosscut from south drift, same level, was extended 20 feet. There were employed 17 miners, 1 foreman.

THE BODIE CON.—Jointly with Mono west crosscut from joint upraise from the south drift, 1200 level, was advanced 20 feet.

Nevada.

QUARTZ STRIKES.—*Tidings*, Aug. 6: J. G. Hall and Paul Quick are taking out quartz from a ledge accidentally discovered in the center of the street in Badger Hill. It has been traveled over for 30 years. A crushing paid $71 per ton. The old ledge at the Banner mine has been found again by men in the employ of J. E. Brown and John Spaulding, who are the lessees of the property. Where encountered, the vein is 11 inches wide and the ore is rich in free gold, sulphurets and galena. Extensive developments will follow.

Plumas.

THE ALTONA.—Greenville *Bulletin*, Aug. 8: The Altona mine, owned by T. F. Emmons, is situated between the Cherokee and Green Mountain mines. It runs into the main hill. Judge Emmons has pushed the tunnel ahead 60 feet since he began work on the vein this year. This drift has been cut on the hanging-wall side of the ledge. A crosscut is now being made toward the footwall. The miners have gone six feet but the wall has not yet been reached. It is thought that the vein here is about 15 feet wide. The quartz is generally dark colored and easy of extraction. Mr. Emmons says it prospects well. This report is confirmed by experieaced miners who have prospected the quartz.

TO MAKE A TEST.—More & Owens have concluded to make a test of the quartz taken from their claim in the vicinity of Rush creek. They have secured five pack animals and the necessary equipments, and will pack about 100 tons to the Hoffner mill on Rush creek, about 1½ miles from the mine. They expect to deliver 2½ tons daily. They have a very large body of ore in the vein, and it is expected to yield $15 a ton. The work of pumping out the shaft in the Indian Valley mine was begun last week and will be prosecuted with vigor by Mr. Prentiss, the superintendent. The work of driving the tunnel ahead continues.

Shasta.

A RICH STRIKE.—Redding *Democrat*, Aug. 14: Last Wednesday we saw a sample of gold ore that was glittering with the yellow metal, about 40 pounds of which was brought to town by Whit George. For three years or more he has owned a half interest in a location—the first extension east of Senator J. P. Jones' mine on Clear creek, half a mile south of old Muletown. John Jollie, another old prospector, once owned the other half, but a year or so ago sold out his interest for a nominal sum. Last summer A. S. J. McCoy went in with Whit on the prospect and sunk about 30 feet, and it failing to pan out, McCoy abandoned his interest. But Whit felt confident he could find a good ore chute on the claim, so six weeks or more ago he got his uncle, Dr. Rohm, and Sheriff Hopping to take an interest with him, and started a new shaft about 50 feet south of the first prospect hole. A week ago yesterday, at a depth of 34 feet, he encountered 30 inches of very rich ore, samples of which he brought to town which would mill at least $2500 to the ton. The vein is well defined, but how long this rich ore will hold out remains to be proven.

OLD DIGGINGS DISTRICT.—Redding *Free Press*, Aug. 10: F. P. Satterlee started up the Central mill on Monday. Hart and Fleming have struck very fine rock in their lower level. The road from Star gulch to Walker Brothers' new mill-site on the bank of the Sacramento river is finished. The Mammoth mine is working day and night on their lower tunnel, which is showing signs of improvement all the time. It is rumored that some parties are negotiating for the Reid mine, also the Garfield, which is an extension of the Mammoth.

Sierra.

TUNNEL.—*Mountain Messenger*, Aug. 10: French Co., Howland Flat, are pushing ahead their bedrock tunnel, two shifts, three men on each; and work progresses favorably.

KANAKA RAVINE.—The persons prospecting for quartz on Kanaka Ravine found some very good quartz in the tunnel they are running, last week. They think they have the old Kanaka ledge sure. Henry Binning was here from Alleghany last Wednesday, and reported that the ore at the West End ledge, Kanaka creek, owned by W. G. Montgomery of Ohio, prospects very well in free gold. Only one wall has been found, and the other will probably be reached next week, a width of 20 feet.

GRAVEL.—Riffle Co., Grass Flat, are employing 25 men, and taking out good paying gravel—about seven dollars a load.

San Diego.

JULIAN AND BANNER.—*Sentinel*, Aug. 9: D. D. Bailey is extracting very good ore from the Hidden Treasure mine. J. O. Bailey is shoving the lower level of the Ready Relief in, making slow but sure progress. The dump of the Warlock mine looks like a lumber yard. Timbering of the mine will soon begin. The lower level of the Ready Relief mine is now in over 500 feet and shows splendid ore at its face. If the tunnel work on the Don't Bother Me mine was all put in one big tunnel it would be over 1000 feet long. Colonel Gardner is in 100 feet with his tunnel. This leaves 75 feet more for him to go and then Julian will have another big mine. The Richmond tunnel is in 30 feet. The boys have hard iron rock to contend with, but this does not discourage them, as they are miners and not afraid of hard work. The first contract on the Washington mine is completed and T. J. Daly, one of the owners, who is here, informs us that another contract will be let to sink it 100 feet deeper, work to commence at once. W. L. Fredericks was up from Banner Wednesday, and placed in our cabinet a specimen of gold quartz from the Cincinnati Belle weighing about four pounds that will attract the attention of all comers.

STONEWALL.—Governor Waterman was in town yesterday, but could only remain a few minutes. He reports things humming at the Stonewall. He will soon have his new mill up and pounding out the precious dust in endless quantities. He informed us that they struck richer rock on Wednesday than ever before, and plenty of it.

Tuolumne.

BONANZA.—Tuolumne *Independent*, Aug. 10: The Bonanza mining company are making preparations for the sinking of a shaft on the Bonanza mine. The shaft will be 150 feet deep, and will greatly facilitate the working of the mine at reduced expense. The contract for sinking the shaft has been given to the following gentlemen: Messrs. Jas. and Ed. Fitzgerald, Lafayette Carr, Jas. Daley, Fred. Greiner and Frank Du Pratt.

MARY ELLEN MINE.—Sonora *Democrat*, Aug. 10: The new stamp-mill on this mine on the Tuolumne river is rapidly approaching completion, and will soon require to be enlarged. The vein is large and well defined, the grade of the ore, in free gold, high, and that of the sulphurets unusually so—higher than found in any other mine in this section of the State—assays showing results of nearly $2000 per ton. Another chute of rich ore has just been found.

NEW ALBANY.—The reports from this mine are very satisfactory, the body of ore lately developed on the north end of the mine holding out well. The grade of the ore in free gold is generally good and some parts of the ore body show exceedingly rich, giving an average value in the mill that is gratifying to the owner, Dr. John Walker of Sonora, and his numerous friends. The ore of this mine is very peculiar in structure, having a laminated character built up of plates or flakes of quartz bound together by a silicious or quartz paste. The sulphurets from this mine show considerable galena with the iron and copper, and also a marked percentage of silver sulphurets. The assays made by Mr. Louis Blanding of Sonora and also in S. F. show the sulphurets to be a valuable and profitable addition to the free gold of the mine. The fine ten-stamp water-mill with free water in abundant supply for any number of stamps is in steady operation.

RIBBON ROCK.—The fine water-power mill on this mine, situated near Columbia, has been completed and is now in operation—the work having been done in an unusually short time. The management deserves credit for the rapid yet solid work of construction. The mine promises well for early and satisfactory profits. The ore is of good quality and the vein large and lasting, and an addition to the mill will soon be needed to handle the large output of ore.

SULPHURETS WORKS.—Operations on the ten-stamp mill and sulphuret reduction works of the Golden Gate mine, and also on the Maltman Sulphurets Works situated near town, are being steadily and rapidly pushed to completion. Such works have long been needed and will be an important addition to the industries of the county.

EAGLE.—This mine, situated in the northern part of the county, is looking well under the superintendence of Dr. Tibbetts, and the new steam mill now being erected will be completed at an early day and add another to the bullion-producers of the county.

ELECTRICITY.—There is a move on foot to replace the steam-power of the Buchanan mine and mill with electricity.

NEVADA.

Washoe District.

BEST & BELCHER.—Virginia *Enterprise*, Aug. 10: The northwest drift on the 455 level is in vein porphyry, in which are seen numerous streaks of quartz. The northwest drift on the 1000 level is in a formation the predominant materials in which are porphyry and clay.

CON. CAL. & VA.—The usual quantity and grade of ore is being extracted from the various openings on the 1400, 1435, 1500, 1600, 1650 and 1950 levels. Some good ore is being developed on the 1650 level in the upraise north of the winze. The shipments to the mills are of about the usual quantity and quality of ore. Following is the official statement of the July ore and bullion product: Total ore worked, 10,941 tons; total bullion produced, gold, $111,426.70; silver, $134,381.67; total, $245,808.37; average yield in bullion per ton, gold, $10.18; silver, $12.28; total, $22.46; average assay value of the ore per ton, $30.54.

BELCHER.—Have stoped the 1100 and 1200 south drifts and have resumed work in the old 1300 raise to connect with the 1200 drift. Are also sinking in the 1200 drift to meet it. The 200 east crosscut is out 32 feet. Are just entering the ledge, which so far assays from $4 to $14 per ton.

MEXICAN.—West crosscut No. 1, from the main north drift, 1465 level, is still being advanced into a mixture of clay, quartz and porphyry. The face of the crosscut is wet, which in connection with the quartz disclosed, is a favorable indication.

CHALLENGE CON.—The joint Confidence, Challenge and Imperial north drift on the 500-foot level is now in 841 feet from the Yellow Jacket shaft, 21 feet having been added during the week. The face shows quartz giving low assays.

YELLOW JACKET.—Continue shipping 100 tons of ore daily, showing an assay value of $25 per ton. A good deal of exploring work is being done at various points and some fair milling ore is being found.

SIERRA NEVADA.—The main east drift (joint with the Scorpion) on the 520 level is out nearly 1000 feet. The face continues to disclose numerous clay seams from which there is a slight flow of water.

BALTIMORE.—The usual progress is making in the drifts and crosscuts on the 338 and 225 levels. At several points on these levels deposits of good milling ore have been developed.

HALE & NORCROSS.—On the 500 level the upraise from the face of the east crosscut was advanced 13 feet, making its total hight 25 feet. The top of this upraise is in good ore.

CONFIDENCE.—The progress of the joint Challenge, Confidence and Imperial north drift on the 500 level is described in the letters of the Challenge and Con. Imperial mines.

CHOLLAR.—The usual exploring operations are continued in a formation of a favorable character, but no change of importance has taken place at any point since last report.

OCCIDENTAL.—Are extracting over 300 tons of ore a week. It comes from the 350, 400 and 550 levels. The mill is doing good work and the battery assays are satisfactory.

OVERMAN.—Cut some fair grade ore above and west of No. 3 southwest stope. A good deal of virgin ground lying on the west of the old stopes remains to be explored.

CROWN POINT.—The raise above the 350 level is still in quartz that carries some metal. The south drift on the 700 level is making good headway in favorable ground.

POTOSI.—The 750 level south drift is showing more quartz. The 550 level west crosscut continues in clay and porphyry with some small seams of quartz.

CON. IMPERIAL.—On the 300 level the north drift is showing a favorable formation of quartz and porphyry in the face. The joint Confidence, Challenge and Imperial north drift on the 500 level is in 841 feet from the Yellow Jacket shaft, 21 feet having been made during the week. The face shows quartz giving low assays.

JUSTICE.—The mill is kept running steadily on ore of a good quality. The ore-producing sections of the mine show improvement at one or two points.

UNION CON.—West crosscut No. 2, from the main north drift, 1465 level, is passing through a promising formation of quartz, clay and porphyry.

SAVAGE.—During the week they started a prospecting drift east from the sixth floor of the old stopes and advanced same 32 feet.

SEG. BELCHER.—On the 1100 level the south drift is in quartz that gives good assays. The pay streak is about a yard wide.

SILVER HILL.—The 800 level northwest and northeast drifts are showing no important change since last report.

NORTH OCCIDENTAL.—The south drift from above the 300 level is in vein material of a favorable appearance.

BULLION.—Nothing new in 750 explorations except that the ground is "breaking" better than heretofore.

ANDES.—The exploring drifts are encountering frequent spots of quartz that carry more or less metal.

ALTA.—Mill in full operation and 925 level stopes yielding the same quantity and quality of ore.

UTAH.—The north drift from the main west drift on the 600 level continues in vein porphyry.

ALPHA.—On the 500 level the crosscut still shows in its face quartz that carries some metal.

WARD SHAFT.—Fair progress is making in the work of opening up the 800 level.

NEW YORK.—The raise from the 800 level is in a streak of ore that is growing stronger.

BENTON.—The work of grading for a hoist plant is being pushed to completion.

OPHIR.—The raise in the east drift on the 1465 level is still in porphyry.

Aurum District.

SHIPPING ORE.—White Pine *News*, Aug. 10 Davis & Sanford of Aurum are shipping 95-ounce ore to Salt Lake City. They have a fine property and ought to have a mill to reduce their ore at home.

Big Six Miles District.

IMPORTANT MINING SALE.—Elko *Free Press*, Aug. 10: An important mining transfer took place Wednesday by which the St. Helena Smelting Co. of Trinidad, Colorado, becomes the owner of some fine mining property in Elko county. The property consists of three claims, situated in Big Six Miles district, 11 miles southeast of Toano, and was discovered and located some time ago by Mr. A. P. Shively. The ore runs in silver and lead and there is said to be a large body of it already in sight. Mr. Mark A. Luckenbach, the gentleman who completed the bargain for the property with Mr. Shively, has a very high opinion of the purchase, and has set a force of men at work to open it out. He is agent for the St. Helena Smelting Co., and a mining engineer of high repute. This sale is of great importance to Elko county, as it will be an entering wedge to the development of many of our rich mining districts. Once let Colorado mining men, backed by Colorado capital, get a foothold in eastern Nevada, we will have good times again. We have the mineral, but lack the necessary capital to properly uncover it.

Cherry Creek District.

BULLION.—White Pine *News*, Aug. 10: The Merrimac Co.'s employes had a pay-day this week. The company continues to ship the usual quantity of rich bullion every week.

Eureka District.

TRIBUTERS.—*Sentinel*, Aug. 10: Six tributers in the Lord Byron, one of the series of mines belonging to the Ruby & Dunderberg Co., took out 64 tons of ore last month that assayed over $100 per ton. Three shifts of men are working in the upraise of the Diamond mine, and are making good progress. They expect to have the work completed by the first of the coming month. Joe Mileno sent 6½ sacks of ore to the furnaces some time ago. The shipment was composed of high and low-grade pieces of rock, representing a fair average of the ores of all the mines on the hill. The working result was $276 per ton in silver and gold.

Garfield District.

HARD TIMES.—Inyo *Register*, Aug. 10: Wallace Miller returned here this week from Garfield, Nevada, where he has been at work for some months past. Work in the Pamlico, the principal mine, is suspended on account of a lawsuit just begun, involving the property. Water is very scarce in that camp, as well as throughout that country generally, and this fact has tended to make times harder than they otherwise might have been.

Pioche District.

RAYMOND.—Pioche *Record*, Aug. 3: Work at the Raymond shaft during the past week has progressed far more than was expected. It was thought a week ago yesterday morning that when the big pump got steadily at work, the 12th station, with good luck, would be cleared of water in about a week, but in this they have been agreeably surprised. At the 12th station the water stood about seven feet deep, decreasing slightly in the drift, which is run on a very slight raise. The pump was set steadily at work a week ago last night and in 16 hours the 12th station was pumped dry. An examination of the level then was made. It was found to be in good condition for 1100 feet, at which point a cave in porphyry ground had occurred, blocking the drift and backing up the water. Within a few days the drift was cleaned and this cave removed, when 40 feet beyond, another cave was encountered, the work of clearing which is now going on. This point is but a comparatively short distance from the Black ledge, and the volume of water behind the present cave cannot exceed that which has already been removed.

YUBA.—The work at this mine for several weeks past has consisted of retimbering the shaft and of enlarging and timbering up the Burke tunnel preparatory to extracting ore from the mine. The Yuba is to be worked through the Burke tunnel which taps the shaft 340 feet from the surface, where a station has been put in. At present no development work is going on below. A line of track will run from the Burke tunnel directly to the reduction works, and one handling of the ore only will be necessary. The machinery at the reduction works was set in motion last week and found to run

smoothly and satisfactorily. The leaching department is expected to be in operation by next Wednesday. A. H. Godbe will leach the black ore now on the Raymond dump, of which there is about 2000 tons. He has been experimenting, and feels confident of working it successfully by the leaching process.

Tuscarora District.

BELLE ISLE.—*Time Review*, Aug. 9: West crosscut from north drift, 250-foot level, extended 18 feet, passing through 12 feet of vein matter.

GRAND PRIZE. 400-foot level: West drift from north crosscut extended 15 feet, and west crosscut from south drift 14 feet. No change since last report in either place. Seventy-seven tons of ore have been worked during the week, of an average assay value of $223.06 per ton. The new pump on the 400-foot level is now in operation and doing splendid work.

NORTH COMMONWEALTH.—Joint crosscut east, 225-foot level, extended 20 feet. The face indicates the approach to the vein. East crosscut No. 1 on the 100-foot level extended 13 feet; ore seams still showing in the face.

COMMONWEALTH.—Stopes are looking well throughout the mine. Average battery pulp $220.18. Bullion shipped during the week $12,505.67. Crude bullion on hand $7000.

DEL MONTE.—East crosscut No. 1, 100-foot level, extended 7 feet. The face continues to show high-grade ore, a portion of which is black metal.

NEVADA QUEEN.—South drift from Commonwealth, 150-foot level, has been advanced 10 feet, still showing small seams of high-grade ore.

NAVAJO.—Upraise south end, 350-foot level, extended 8 feet, total hight 72 feet; the upraise continues to yield some rich ore.

NORTH BELLE ISLE.—Fair progress has been made in sinking the shaft below the 400-foot level.

Tybo District.

TUNNEL.—Belmont *Courier*, Aug. 10: The Gilmore Brothers at Tybo are prosecuting work on their mine, known as the F. G., with satisfactory results. They have run a tunnel 300 feet easterly on the ledge and are now at a depth of 140 feet vertical, with a ledge 18 inches in width. The ore has changed from a silver ore at the surface to a gold ore at this depth. Assays from the face of the tunnel show an average of $31.50 in gold and 12 ounces silver. The change from silver to gold is unusual but extremely satisfactory to the owners.

THE MA ALTA MINE at Tybo is being worked by a full force of men and good ore steadily extracted. There is at present on the dump 700 or 800 tons of high-grade ore. The ore will be soon shipped to Eureka for reduction. It takes a good mine these days to stand the expense of shipping ore by team such a distance and then bearing the discount.

ARIZONA.

DOS CABEZAS.—Silver City *Enterprise*, Aug. 10: The Dos Cabezas district, north of Apache Pass, in the Chiricahua mountains, Cochise county, Arizona, is again attracting attention. In 1880-81 this camp had quite a boom, and was in a fair way to attain prominence as a producer. A. E. Fay published a newspaper there and made known to the world the wonderful richness of the country, which attracted many mining men. Fair prices were offered for many of the properties, but the owners all held their claims at fabulous figures; the result was, that moneyed men did not invest very extensively, and the claims remained in the possession of their original owners. A number of the best claims have remained in the possession of their locators, who having stayed with the camp through all these years, will probably now be able to realize on them. Most any of them would now sell for less than a million, having realized that while quartz may be very solid food, it is not easily digested. The camp contains some immense ledges of low-grade gold ore as well as mammoth copper veins, is delightfully situated and is easy of access.

QUEEN BEE.—Mohave *Miner*, Aug. 10: The lessees of the Queen Bee mine have put on a double shift and are pushing development work.

SAMPLING WORKS.—The sampling works this week have run through the following lots: Theodore Meyer, lessee on C. O. D., 1½ tons high-grade ore, C. O. D. mine, 52 tons of ore. Rogers and Fisher, a small lot from the Smuggler; Wm. Garnt of Hackberry, a small lot of ore from Carey and Miller's claim. Four carloads of ore will be shipped this week.

THE O. K.—Messrs. Patterson, Rowe and Fox are working on the O. K. in Gold basin and are taking out some fine ore. The ore is taken to Patterson's mill and is being run through the arastra. Three miners are at work in the mine and Sol Rowe runs the arastra.

SHIPMENT.—Frank L. Smith shipped this week five carloads of ore to the Rio Grande smelting works at Socorro, N. M. The shipping of ore direct to the smelter is new in this county.

THE NEW DISCOVERIES at Hackberry are developing better than the discoverers anticipated, and Hackberry may resume its old-time liveliness before another year rolls around.

THE Keystone mill, Mineral Park, has received the carload of salt for which they have been waiting patiently, and the mill will soon be running again.

TO SUSPEND.—It is said the Monarch M. Co, will again suspend operations on the Golden Gate mine in Lost basin.

MICA.—Florence *Enterprise*, Aug. 10: Paul Siebert, an old prospector, has been hunting over the Maricopa mountains two months or more in search of mica, and he thinks he has found it. He has traced the deposit for 3000 feet and has taken up two full claims, each 1000 feet by 600. The mica occurs in a rock that resembles sandstone and marble both. This must be carefully split open in order not to shatter the isinglass, a mistake made over two years ago by some Tucson parties working in that section. These claims are probably in the vicinity of a very strong vein of mica discovered by Mr. David Moe last fall, which were located by himself, Ed. O. Smith and others of this place about two months ago. The indications point to the existence of immense bodies of mica of excellent quality that can be mined in large-sized sheets.

COLORADO.

NOTES.—Idaho Springs *News*, Aug. 9: A number of lessees are at work on the Humboldt. The Silver Queen shaft is being sunk another lift. The boys leasing on the Esmeralda shaft are sending some rich ore to the surface. Owens & Son made a shipment of a carload of ore from the Silver Queen yesterday. The Lamartine continues to ship heavily. 11 ore-sorters being kept busy preparing its production for shipment. Bowden & Co. keep several sets of lessees constantly at work on the Tropic, which is shipping considerable mineral. During the month of July there were shipped from the station at this place, 117 carloads of ore, containing a total of 3,086,200 pounds. Callow & Son made a shipment from the Grand View a few days ago, netting them a handsome sum. Kooken & Brown have had the good luck to bring their shaft on the Casino into mineral again. The pay streak in the bottom averages about three inches solid. Some Georgetown parties have secured a lease and bond on the Bunker Hill, formerly the Red Lion, on Ute creek, and have begun extensive development work. Ute Creek is on the boom and a great deal of activity prevails in that lively camp. During the month ending July 31st, W. J. Chamberlain & Co., ore samplers, shipped 1,230,000 pounds of ore carrying 21,340 ounces silver, 705 ounces gold, 42,000 pounds lead and 4000 pounds copper. The bins at Berry's concentrating and sampling works at present contain over 150 tons of ore from the Dove's Nest. The mill is treating an average of 16 tons per day, from which four tons of concentrates are obtained.

SYLVANITE.—Elk Mt. *Pilot*, Aug. 10: Supt. Murphy informs us that he is arranging to start the air-compressor drill in the Sylvanite tunnel at once, and that he expects to have 20, and probably 40, men at work on this mine all winter. Mr. Baker is securing funds to work the mine. No ore will be taken out, but it is proposed to put the mine in good shape by running tunnel to the vein and doing other development work. The tunnel will have to be run about 1100 feet to cut the vein, and with the air-drill about eight feet per day can be driven.

IDAHO.

THE ELK HORN.—Boise City *Statesman*, Aug. 10: Recent developments at the Elk Horn mine made upon the parallel or accompanying vein to the main lode here brought into view a fine body of good ore which will pay well as soon as the improved facilities for crushing, now under way, shall be in place. The Boston syndicate which now owns the Elk Horn is becoming every day better and better satisfied that it has been fortunate in making a good investment. Those who are well acquainted with the Elk Horn, and who know the exact condition of the main lode as it was left several years ago when operations upon it were suspended on account of water accumulating in the mine, all testify to the fine body of rich ore then in sight on the lode. The present management is pushing a crosscut from the lower tunnel in the direction of the main lode, and the character of the rock through which the crosscut is passing gives every indication of a near approach to a rich lode. In working the accompanying vein by the lower tunnel, some $40,000 have been taken out within the past few months. It is best not to anticipate too much, but everybody feels confident that a few months more will develop at the old Elk Horn one of the finest mining properties on the continent.

BOYLE MOUNTAIN.—Wood River *Times*, Aug. 9. Andrew J. Dunn, the well-known old prospector, has just returned from a trip up Warm Springs creek as far as Boyle mountain, and about 12½ miles west of Ketchum. He reports at least two bonanzas in sight on Boyle mountain, and a third being shown up. The largest of these was opened by Milt. Mourning. Mr. Mourning has exposed a chimney of ore 43 feet long and from 5 inches to 6 feet in width, with more ahead of the breast or face of the drift. This ore carries from 54.40 to 84.70 ounces silver per ton, and an average of 72 per cent lead. About three-fourths of a mile above, a Mr. Flannagan has leased the Niagara mine, and has already exposed a width of four feet of solid galena. He is now prospecting his find to ascertain its extent. In the same vicinity Jerome Jacobs and a partner are working the Ten-Broeck mine on a two-years' lease. The showing is very encouraging, and Mr. Dunn says that there is every prospect of the leasers making some money out of it.

AT THE RED CLOUD.—Wood River *Times*, Aug. 10: The owners of the Red Cloud mine propose to lose no time in getting to work again. Although the ground is hardly cool after the fire of last Saturday and Monday, they have already got lumber and shingles on the ground to rebuild the boarding-house and blacksmith shop. As soon as completed 10 men will be put to work knocking down ore, and as soon as these open up the stopes additional men will be put on, so that probably 25 will be at work by the end of September. It is the intention of the owners to extract from $15,000 to $25,000 worth of ore before snow flies, when they will put in their winter supplies and reduce their force to the winter complement.

BEAVER DISTRICT.—Wardner *News*, Aug. 3: Henry Lamb and H. Drought are owners of a location known as the Father lode made on June 3d on the divide between Nine Mile and Beaver creek and one-half mile south of Sunset peak. The first indication made visible to the prospector was a piece of float weighing fully 700 pounds of carbonate ore. On this discovery the work of sinking was begun and ore found to a depth of 12 feet. The vein now shows a width of two feet of good ore, and work will be continued until full development of the claim is made. The first assay made of the ore by J. Johnson shows 15 ounces silver and 70 per cent lead; the second, 24 ounces silver and 82 per cent lead.

LALANDE DISTRICT.—The work of enlarging the Poorman concentrator was commenced this week. It will be hurried to completion as rapidly as possible, and when finished will give the mill a daily capacity of 200 tons.

GEM.—Mr. Finch, superintendent of the Gem mine and mill, says their concentrator will be ready to run about the 10th instant.

SEVEN DEVILS COUNTRY.—Idaho *Avalanche*, Aug. 10: The mines of the Seven Devils country have been shut down. This is quite a surprise to all, as these mines gave promise at first to take the lead in Idaho. The probable cause of closing them is the expense of hauling from the mines to the nearest railway station. But if a railroad were built there enough ore could be taken out at such a decreased expense that it would pay the owners very well.

LOWER CALIFORNIA.

RICH AVERAGES.—*Lower Californian*, Aug. 8: Some of the mill tests of ore from the various mines at Alamo bear out the enthusiastic assertions of even old forty-niners that it is one of the richest districts on the coast, and with the most promising future of any. Six sacks of ore sent to San Francisco, taken from three Alamo mines and carefully sampled, and crushed and worked by mill process, yielded $109.49 in gold and silver per ton. The silver was $1.15—only a trace. Another six sacks were taken from all the mines of any note in camp and the yield as reported by the same mill process was $79.50 per ton. The ore from one mine, worked in an arastra, gave from $115.16 to $160.20 per ton. In another it yielded $89.90 per ton in gold, with not a trace of silver. There is no one who believes that the general average of this ore will give such results, but the run of $43 in the Torres mill shows that the average will be pretty high, for there are 20 mines in the district that will yield the same grade of ore.

JUAREZ MINING CAMP.—Good news comes from the old mining district of Juarez, about 95 miles northeast of this place and 30 miles south of the boundary line. The district having been previously abandoned, was granted about a year ago to Col. Castro de Beraza, who at the same time obtained a concession to a block of valuable mineral ground in the Valladares region. Col. de Baraza was at the East for some months, during which time he organized a company for the exploration and working of his concessions. He returned two or three months ago, accompanied by a corps of surveyors, with outfits, to survey the ground in order to obtain legal possession. Some 60 men were put to work in the placers at Juarez, and through new discoveries the concession is likely to prove of great value. It is reported that the placers are already yielding a handsome profit above wages.

ALAMO. — *Lower Californian*, Aug. 8: A rich strike has been made on the Anna mine, situated on the east side of Tomasa mountain, by Mr. Owens, of the El Paso Mining Co. The Anna is one the El Paso folks bought of Capt. Frazier. The ore is in a decomposed quartz which is full of gold. Capt. Owens says it is the richest of any of the famous finds of the Texas, El Paso or Avalina. The discovery was made Friday. Alamo is now in a fair way to get what she has most needed—mills and machinery. We have now two mills and five more are coming. Those coming comprise C. C. Lane's mill, part of which is already here; a new 10-stamp mill belonging to a Mr. Post of New York; the International Co.'s mill; the El Paso Co.'s 10-stamp mill, and the 10-stamp mill of Col. S. H. Lucas. Besides these, five additional stamps are being made for the Torres mill.

SANTA CLARA BASIN is coming to the front. For awhile it was despised and rejected of men, but the discovery of rich leads has turned a stream of prospectors in that direction. Some of the first discoveries were made in the basin as early as the first of March, among them being the Centipede, Summit, Cholla, Maud S., Castor and Minerva. The operations of the Santa Clara M. Ass'n and the Liberty M. Co. have been confined to the basin. Now reports of new discoveries are coming in, from even as far as 12 miles north of Alamo, on the trail into Santa Clara valley, where Beteta & Co. have denounced the Matilda.

NEW MEXICO.

BLACK HAWK.—Silver City *Enterprise*, Aug. 10: Tom Altwood and Dan McMullen are leasing on the Atlantic, at Black Hawk, and are meeting with encouraging results. Ben Hopson is working six men on his mine at Black Hawk, and is taking out some excellent ore. He will soon make another shipment of high-grade ore. James Demorest has purchased Mr. Taylor's interest in a sub-lease on a certain part of the Old Man mine for $500. Abner Enoch, who is leasing on the Old Man, was in town this week with some specimens from the mine worth $1 per pound. He has a good-sized pocket of this class of ore. The *Enterprise* has been informed by Judge Henderson and Benjamin Harrison, superintendent of the Pacific, that the new strike is on the Pacific ground and not on an extension, as this paper stated last week. The width of the vein in the new strike is nine feet, of which there is an ore streak of fully five feet of good pay ore which will average over $20 per ton. This is probably the largest strike yet made in this country.

MONTANA.

ACTIVE.—*Inter-Mountain*, Aug. 8: Quite a local revolution has occurred in copper mining during the past week, and once more the Chambers syndicate and other mines have renewed their old-time activity. Those that have not will in the very near future, according to reliable reports. The St. Lawrence has again resumed sinking, owing to the very recent developments in the drift connecting the St Lawrence and the Anaconda on the 800-foot level. Ore has been taken out richer in quality than ever before encountered in that mine. The Orphan Boy, a mine of the Anaconda company, has also commenced sinking from the 200-foot level, and will also sink 200 feet additional. The Chambers syndicate mines commenced operations yesterday morning. The Green Mountain put on three 8-hour shifts, sinking from their present depth of 300 feet, and will also sink 200 feet. The Modoc put on a number of miners some time back, sinking their main shaft. The High Ore blew its first whistle yesterday morning, and 20 men on a shift, for the first time in months, descended into the depths to bring forth its precious metals. The management of this mine has devolved on Joseph Laird. The reason of the so early resumption of the High Ore is on account of the St. Lawrence and others sinking, so as to be in readiness when the new smelter is completed.

THE CHAMPION MILL.—From Mr. Willard Bennett, one of the principal owners of the Champion mine in the Oro Fino district, it is learned that the company has decided on the erection of a mill immediately. The site has been chosen about one mile east of Deer Lodge, on a slope of the bench between Peterson creek and the Deer Lodge river. A contract has been let to the Utah & Montana Machinery Co. for a 20-stamp, chloridizing silver-mill, which is to be completed in November of this year. The Champion is now developed to the depth of 350 feet, with east and west levels at the 250 and 350. At the 250-foot level, the lead is from 2 to 14 feet in width, and a large quantity of ore has been shipped from it which has netted the company $1400 per car. At the 350 the lead is in no place narrower than 4 feet. Comparatively only a small quantity of ore has been shipped from the depth of 350 feet, but that sent has netted the company $2000 per carload. The shaft is a two-compartment one throughout, and the company has let a contract to Fraser & Chalmers for hoisting machinery of a capacity sufficient to sink the shaft to the 1200-foot level. All these improvements are to be put through without delay.

OREGON.

THE MONUMENTAL.—Bedrock *Democrat*, Aug. 8: This mine is in Granite district, Grant county, and almost west of Baker City, back of the high mountain peaks so prominently seen from this city. Last year the property was listed with Mr. T. Gilbert Bowick of London, who effected a sale, and a company, the Eastern Oregon G. M. Co. (limited) of London, England, incorporated with an authorized capital of $1,250,000. This company, composed as it is of wealthy men, have, since their coming into possession of the property, spent upward of $75,000 in development work and improvements on the same. Besides the many new improvements in the mill, the company has added an air-compressor which furnishes the power to operate the Rand drills in the tunnels and supplies pure air for the tunnels, also. The company is now engaged in running a tunnel, which, when completed, is expected to be 1200 feet in length, nearly 500 feet of which is already finished. Rand drills are used in the boring, and 120 feet per month is the headway being made. About 30 men, mostly miners, are employed by the company, and work on three other tunnels is being rapidly prosecuted, and the showing of ore is a fair indication that a large and rich ledge will yet be uncovered.

THE RED CLOUD is situated on Onion creek toward its head at an elevation of about 6000 feet, and is owned by Isaac Klopp and J. R. Bowick. Several tunnels have been run a distance of from 100 to 200 feet, not referring to the one on which all forces seem to be concentrated at the present time. This tunnel is now in about 600 feet and taps the ledge at a distance of 300 feet from the surface. From the entrance of the tunnel to its face a fine body of ore is uncovered nearly the entire distance. In the face of the tunnel a ledge fully two feet in width is found showing rich black sulphurets. From this tunnel to the surface is an upraise and a fine body of ore is here exposed. It is the intention of the owners of the Red Cloud to continue the long tunnel some distance farther and then to construct another to tap the ledge at still farther depth.

THE LA BELLEVUE.—After visiting the Red Cloud the reporter continued his journey and arrived at the famous La Bellevue mine owned by Messrs. John and Fred Cabble, situated on the highest point of one of the spurs of Bally mountain at an altitude of 8000 feet above the level of the sea. Starting at Tunnel No. 1, which is run a distance of about 400 feet on a continuous ore vein, we find a ledge in the face between four and five feet in width; then through Tunnel No. 2, a distance of 550 feet, which follows an immense body of ore the entire length; then through Tunnel No. 3, a distance of 840 feet, where the ledge is continuous, varying in width from five to twelve feet, and in the face of the tunnel, where ore is now being extracted, the ledge is five feet in width and the ore is of the richest black sulphurets, some of it going $1000 to the ton. Messrs. Cabble Bros. have a small mill in operation, consisting of a Dodge pulverizer, Golden Gate concentrator, etc., and are shipping their concentrates to Denver for reduction. Much of the ore taken from the mine is so rich that it is not worked in the mill but is shipped direct to Denver.

UTAH.

BEING DEVELOPED.—Park *Record*, Aug. 10: The Wasatch group, situated in Blue Ledge district east of the Ontario, is developing into a veritable bonanza. It is owned by S. P. Hoyt of Kamas, who a few months ago gave Messrs. E. C. Williamson, Jas. McCune and John Farish a seven-years' lease on this and other properties and also a bond for $100,000 on them. This Wasatch property of Hoyt's would never have amounted to anything by the old plan of operation, but as soon as the fortunate leasers obtained control of the property they immediately went to work to develop it properly. The vein in the old workings has been explored into new ground and connection made between the upper and lower tunnels. A fine vein is exposed between well-defined walls, the pay chute averaging two feet in width. Assays show the ore to be high-grade smelting, carrying over 80 ounces silver and about 50 per cent lead to the ton. A new road to facilitate ore shipments is being made, a large boarding-house is in course of erection and the working force will be increased from time to time. In a short while enough ore will have been taken out to commence and continue shipments on a large scale.

ORE AND BULLION SHIPMENTS.—The Ontario bullion shipment for the week was 33 bars, containing 18,434.39 fine ounces of silver. During the week the Mackintosh sampler received 569,720 pounds of Ontario ore; 383,600 of Daly; 114,750 of Mayflower No 7 leasers'; 58,250 of Woodside concentrates from the Union concentrator, and 42,500 pounds of Woodside first-class ore; total, 1,168,820 pounds.

THE COMSTOCK GETTING BETTER.—Since last week the six-foot ledge encountered in the Comstock has continued to widen and it is more than holding its own as to the character of the pay streak, which averages two or three feet in width.

ABOUT THE ALLIANCE.—Everything is in shipshape at the Alliance for making even faster progress in driving the 4800-foot drain tunnel.

MECHANICAL PROGRESS.

Foundry Literature's Present Need.

Practical literature upon the workings of any trade can inaugurate more progress in one year than could be accomplished in 50 years or more without it. Show me a trade "well written up" and its literature recognized and studied, and I will show you a body of tradesmen well entitled to be called mechanics.

That molding was, four or five years back, about the same as it was 50 years or more ago, was a very noticeable fact. Many looked upon molding as a trade not susceptible of improvement, and one governed more by luck than judgment. It is safe to say that the above unhappy state of affairs is at the present day being greatly remedied, and that the improvement can be largely credited to literature which has for the past five years appeared upon molding.

While the past few years have witnessed a great improvement in many molders, the few years to come will witness a still greater advancement. Molding is now being studied as a trade beset with difficulties, and which can be largely overcome by intelligence, and much that was allowed to be controlled by chance is now governed by knowledge, which makes desired results positive.

It is not the purpose of this article to state the points molders are, as a rule, deficient in; that is well enough seen or proved by the past or present uncertainty attached to the procuring of good castings; suffice it to say that this is every day being more and more overcome, and that the molder who is not capable of progress will soon find himself behind in the race.

The past few years have well proved the value of literature in advancing trade knowledge—especially so in foundry work. The kind of literature the writer has reference to is that written by men who work at the trade they write upon, and not that kind from which literature upon several different trades has usually emanated. A well-known publisher is reported as saying a few years ago that "mechanical literature would not sell." At the time the expression was used such was, no doubt, the case, from the fact that there was then little or no literature which would benefit a tradesman. Mechanics are not fools; give them literature written by men of personal experience and they are not slow to appreciate it. One trouble which now exists, and has in a great many cases to be overcome, with reference to getting molders to read trade literature, is to convince them that it will be valuable to them. I doubt if there is an intelligent molder living, and having the means, but what would subscribe for all the practical literature he could find bearing upon his trade, if some one would only get him once interested and give him a taste of what benefit he could derive from the same.

That there is a large field at present for missionary work in getting molders interested in foundry literature cannot but be evident to all who are so placed as to know how ignorant the general run of molders are upon the elements which govern the successful work in their line. The need at present is not so much the call for more practical writers as it is that those who do write shall be read more. Therefore, if you have anything containing foundry literature which you know would interest and instruct a brother molder, let him see it or know about it, and you will do much good toward removing the present bar to progress in foundry literature and in the elevation of the molder and his trade. —*Thomas D. West in American Machinist.*

IMPROVED PILE-DRIVING DEVICE.—It would appear that, in the matter of pile-driving by machinery, the apparatus employed in England at the present time is a decided improvement on the device which has so long been in use in this country for that purpose. Raising a hammer and having its weight drive the pile into the earth as the hammer falls, notwithstanding its accomplishment of the work, involves an amount of time out of all proportion to what should be required for such a result. In the improved device the driver is made in the form of a heavy steam cylinder, the lower end of which forms a hammer-head and acts upon the pile. The piston-rod is extended sufficiently to form an eye, a rope being attached to this, and by means of which the whole device may be raised and lowered by a hoisting engine in the customary manner. In driving the pile, steam is admitted to the cylinder, which is raised to a hight only limited by its length, and the simple operation of opening a large exhaust valve causes the cylinder to fall upon the pile and drive it a certain distance. The effective blows thus given can be repeated very rapidly.

A NEW AND VALUABLE IRON PRODUCT.—The want of a material intermediate in strength between steel and cold-blast iron has long been felt by customers, says the *Tradesman*. It occurs in cases of hydraulic cylinders, mill gearing, trammer blocks, etc., that the best iron fails to make articles of sufficient strength without increasing the dimensions to an unreasonable extent. On the other hand, the high price of steel castings and their liability to contain blow-holes offer serious objections to their adoption in such cases. A consideration of these facts led Williams, Arnold & Colley, Spanish Steel Works, Sheffield, Eng., to try and produce a metal which, though not quite equal to steel in strength, would, nevertheless, be far stronger than the best cold-blast irons made in this country, and also be capable of producing an absolutely sound casting. After some years of experimenting, they have succeeded in making a material which they call "steel pig," possessing some very remarkable properties. As regards mechanical strength, a bar 2x1 inches, bearings three feet apart, sustains a weight of about two tons. The strain supported by the "gray steel," when in tension, is upward of 15 tons per square inch, that of the best cold-blast iron being 11 tons. Castings made from the new material are soft, tough and quite free from blow-holes, and can be made from the raw pigs in any cupola with a good blast pressure. The purity of the metal, as regards phosphorus and sulphur, together with its comparatively low carbon and silicon, to a great extent accounts for its remarkable strength. The process adopted to produce these results is to purify the best hematite iron obtainable by removing nearly half the carbon and almost two-thirds the silicon, thus leaving in the finished product only sufficient quantity of these metalloids to render metal gray when cast.

RAILWAY WINDOW CATCHES.—Some of the highest developments of mechanical ingenuity are to be found in connection with details of railway construction and equipment, but it must be confessed that some things show a woeful lack of common sense. The catches which hold modern car windows, and the handles by which they are supposed to be lifted, are examples in point. The handle is generally a small recess or projection, only deep enough to receive the tips of the fingers of one hand, while the catch is on the right-hand side of the window, out of reach of the handle, and requiring the entire use of the right hand to release it, while the left hand is struggling to raise the sash. As the window generally sticks throughout the season when it is required to be frequently moved, this senseless arrangement is the cause of much irritation, profanity and broken finger-nails. There is no good reason why the windows should not be made to work freely, and in any case the handles should be so arranged as to permit a man to exercise some moderate portion of his strength upon them, and not have to struggle in the vain effort to lift a sticking window-sash with the extreme tips of the fingers of his left hand, while the right is occupied in holding a small catch out of gear. There are numerous ways in which this detail of car-fitting might be made reasonably serviceable, and it is to be hoped that some day the engineering ability of our railroad companies may be induced to solve the problem. *Mechanics.*

ANOTHER REVOLUTIONARY LOCOMOTIVE has been devised. It is to have two boilers, one above the other, and engine and tender are to be incased in a shell of thin iron tapering off to a point in front, the whole machine being 75 feet long and weighing in working order 91½ tons. Thus it will be 22 feet longer and 12 tons heavier than the largest European locomotive yet turned out. It is to have two pairs of cylinders 15¾x19½ inches, and four coupled driving wheels 9 feet 9½ inches in diameter, or more than twice the size of our large passenger-engine drivers. Great power and great speed are both claimed for this novel combination of parts and proportions, the ordinary gait being modestly placed at 75 miles an hour, but this being capable of increase to 92 miles per hour.

AN IMPROVED ANVIL has been introduced by O'Brien & Carew, 59 Swett street, Boston, so constructed that the face, which is liable to wear out, is readily replaced, thus avoiding the expense of purchasing a new anvil, as the defaced or worn part can be taken out and dressed by a blacksmith in a short time, or a new die be put in at a comparatively trifling expense. The dies are solid forgings from the best cast-steel, and the face of the anvil is chilled ½ inch in depth to correspond with the hardness of the steel dies. The body of the anvil is two-thirds steel, one-third iron being referred to as necessary in its formation to toughen it.

NEW METHOD OF MAKING MALLEABLE IRON CASTINGS.—Mr. C. C. Townshend of Madras has taken out a new patent for the making of malleable iron castings. Wrought-iron scrap is melted down in crucibles with the addition of small quantities of phosphorus and silicon, and when cast gives a malleable material which is also capable of being chilled. The best mixture is: 22 pounds of scrap, 7 ounces of fine river sand, and 5 ounces of bone ash, with a small quantity of glass as flux.

FURNACE PRODUCT.—According to London *Iron*, Mr. Alexander Pourcel has succeeded at the new basic open-hearth steel works of Bell Brothers in producing from Middlesbrough pig carrying 1.7 per cent of silicon and as much phosphorus, steel with as low as 0.03 per cent of phosphorus. The lining of the furnace is chrome ore.

A HEAVY PATTERN CASTING.—In the machine hall of the Paris Exhibition is a casting weighing ten tons. This piece de founderie is not intended to serve any useful purpose, but merely intended to show what can be accomplished by pattern-makers, molder and founder. As regards intricacy of detail it has never been surpassed.

SCIENTIFIC PROGRESS.

Combustion.

The source and origin of fire has ever been a subject of much discussion and abstract speculation from the time of Plato and Zeno to Newton and Faraday. For the benefit of those readers who have not traced the history of this phenomenon, we will go back a few years in its past history, back to the time when Stahl stood in the full meridian of his glory dictating to the world the Stahlian doctrine of the phlogistic hypothesis.

According to Stahl, all combustible bodies contain a certain principle which he called phlogiston, to the presence of which he ascribed their combustibility. He supposed that when a body burns phlogiston escapes from it, and that when a body has lost its phlogiston it ceases to be combustible and is then a dephlogisticated or incombustible substance. The heat and light which accompany combustion were attributed to the rapidity with which phlogiston is evolved during the process.

The discovery of oxygen, made by Priestly in 1774, proved fatal to the Stahlian doctrine. Lavoisier had the honor of overthrowing it and of substituting in its place the antiphlogistic theory, namely, that combustion and oxidation in general consist in the combination of combustible matter with oxygen, which is a constituent part of atmospheric air. To account for the evolution of heat and light during combustion, Lavoisier had recourse to Black's theory of latent heat, *i. e.*, heat is always evolved when a substance, without change of form, passes from a rarer into a denser state, and also when a gas becomes a liquid or solid, or when a liquid solidifies, because a quantity of heat previously combined, or latent, within it is then set free. This is precisely what happened in some instances of combination; thus water is formed by the combination of two equivalents of hydrogen and one of oxygen (H_2O) in which case two gases give rise to a liquid; or in the oxidation of metals, oxygen is then condensed to a solid. But the evolution of heat and light is now known to depend upon peculiar modes of motion of portions of matter.

Thus abstract and hypothetical ideas and explanations have been ardently advocated by scientists, who rose in one generation, and like their philosophy, died in the next. But in reviewing the past we should become oblivious to its imperfections, for it is obvious that in the rise and fall of each, science made one slip toward truth and beauty. And so to-day, we look upon those bygone doctrines, as upon the metamorphosis of the ancients, as being something of the imperfect past.

It is commonly believed that causes underlie and influence all material phenomena. The final cause of phenomena we term force, accepting for the various kinds of phenomena a variety of forces. The strange phenomenon combustion is simply a physical manifestation of chemical alterations in the constitution of bodies. As heat and light are peculiar modes of motion, therefore, in the aggregation of simple substances to form compound bodies, or in the disaggregation of compounds into simple substances there occurs a change of position of the atoms of which matter is composed; this change of position or motion becomes manifest in the phenomena heat, light and electricity.

As all chemical compounds are formed according to the affinity of their component parts, it is evident that those substances which have the greatest affinity for each other will unite with the greatest rapidity; thus, the affinity existing between hydrogen and oxygen is so great that when a match is brought into contact with a mixture of two equivalents of hydrogen and one of oxygen, a violent detonation ensues, with the production of water. The heat evolved by the burning match overcomes to a certain extent their cohesive attraction, thus causing an increase in fluidity, which facilitates the combination of the part of the gases which are in favorable contact; the heat produced by the union of the atoms passes from one to the other, causing a flash resembling lightning to pass through the mixture, rendering the union to the eye instantaneous.

This explanation is also true when applied to account for the production of heat and light in the combination of other substances. When pulverulent antimony or arsenic is thrown into an atmosphere of dry chlorine gas, the combination is so energetic that each minute piece of the metals glimmers like little stars, and before the particles reach the bottom of the bottle they have been reduced to an oily fluid, which is the chloride of antimony or arsenic, as the case may be ($SbCl_5$) ($AsCl_3$).

When speaking of the air as being a supporter of combustion, it is only so to those substances for which its oxygen has chemical affinity; thus, the spermaceti or ordinary stearine candle burns in the air because by the aid of heat the gases (or properly some of their component parts) which they evolve have a strong affinity for the oxygen of the air, therefore the heat and light which they produce is caused by the disaggregation of those hydrocarbon compounds, and in the production of other gases and vapors which disperse themselves throughout the atmosphere.

Every chemical union which occurs in a gaseous medium, and is accompanied by the evolution of light, chemists designate combustion. But we observe some bodies, such as sulphur and phosphorus, yield a flame when burned in the air or other gas; such substances are converted into gases or vapors at the temperature of combustion. Carbon burns in the air without a flame, becomes incandescent because it is non-volatile. The carbon compounds, wood and bituminous coal, are indeed non-volatile, but burn with a flame, because under the influence of heat they develop combustible gases. Flame is, therefore, nothing more than a combustible gas heated to incandescence.

We have before shown that combustibility is only a relative phenomenon; for if hydrogen will burn in oxygen by chemical affinity, so conversely will oxygen burn in an atmosphere of hydrogen by the same attraction. Illuminating gas, which is a compound of methane, ethylene, and a slight quantity of acetylene, together with hydrogen and carbonous oxide, burns in the air; so, conversely, will air, or properly its oxygen, burn in an atmosphere of illuminating gas.

This may be demonstrated in a very conclusive manner at a very trifling cost.

Take an ordinary lamp chimney and fit to the lower end a cork perforated so as to admit three glass tubes; one, a gas tube, should have an orifice of about 1-16 of an inch in diameter, and the air tubes should have an orifice of about 1-16 of an inch, left open for communication with the air. The gas issuing from the gas tube is ignited and the chimney is then dropped over the not too large flame; it continues to burn quietly, as sufficient air enters through the air tubes to support its combustion. Upon increasing the supply of gas, the flame becomes larger, filling the globe with illuminating gas, while the air is crowded back because under less pressure. As there is an atmosphere of illuminating gas in the chimney, and the air which enters is not sufficient for its combustion, the gas flame is suddenly seen to leap from the gas tube and ignite the air which enters, and burns with a faint light accompanied by a strange hissing sound. The excess of illuminating gas escaping from the upper part of the globe may be ignited; we then have a gas flame above and two air flames within the globe. On lessening the flow of the gas the air comes in in a quantity sufficient for its combustion, which is ignited at the end of the gas tube, while the air flames are extinguished. In this manner we may repeat the return process of the flames at will.

The gas consumed by an ordinary gas jet is sufficient for the combustion of ten jets of air, producing a temperature of about 1700° Fahr. At a very small cost a lamp could be made with which to burn the oxygen of the air. Its high temperature could be utilized in many ways.—*Theodore Douglass in Modern Light and Heat.*

HOW MIND MAY RULE MATTER.—Much has been said and written of late in regard to hypnotism—the power which any one possessing this quality may exercise over another person who is susceptible to its influence, and especially in regard to hypnotic promptings to the commission of crimes. In this latter regard M. Liegeosis, professor of law at Nancy, has made a special study of hypnotic suggestion in the relation to civil and criminal law, and has published his results in a recent memoir, says the Chicago *Tribune*. He has made a large number of experiments to establish the possibility of suggesting crimes, which the subject of such suggestions may carry out while ignorant of the motive-power that guides their hands. The following was one of his experiments: Arming himself with a revolver, he took a subject at random from among the five or six somnambulists with him at M. Liebault's. To remove any possible idea of play, he loaded the revolver and fired one shot in the garden. Then he went into the house and showed to one of the subjects a card just pierced by the ball. "In less than a quarter of a minute," he said, "I suggested to Mme. G—— the idea of killing M. P. by a pistol shot. Absolutely unconscious and perfectly docile, Mme. G—— approached M. P. and fired the pistol. The commissary questioned her immediately. She confessed her crime with complete indifference; she killed M. P. because she did not like him. They could arrest her. She knew well what awaited her. She was asked if I had not suggested the idea of the murder she had just committed. She assured us that this was not so; that she was led to it spontaneously, and that she alone was to blame."

A STATISTICAL AUTOMATON has just been put on trial in the office of the Board of Health, New York. With the aid of an electric battery this automaton is expected to tabulate, with unprecedented rapidity and correctness, all the statistical information which it has heretofore required some 10 or 12 clerks to handle. The machine was devised originally for the purpose of tabulating returns of the eleventh census of the United States. It records, on small square cards, all sorts of statistical data concerning sex, age, race, marriage, death, disease, occupation and dwelling-place.

ELECTRICAL EXECUTIONS.—Mr. Edison, on being interviewed by the New York authorities in regard to the possibility of failures in electrical executions, gives it as his opinion that they are both sure and painless when properly performed. It appears that France is likely to follow the example of America in the manner of inflicting capital punishment, for a proposal is now advanced to abolish the guillotine and substitute death by electricity.

GOOD HEALTH.

A Lesson From the Late Slogging Match.

It is a matter of congratulation that amid the mass of evil connected with the late brutal slogging match at least one important question for good has been extracted therefrom by the *Occidental Medical Times* of Sacramento. This lesson is found in the training to which Sullivan was subjected in preparing him for the contest. This great animal-man, with a naturally magnificent physique, had been reduced by dissipation to a mere wreck of his former self. His flesh was flabby; his limbs weak and unsteady; his stomach was rejecting and unable to work up the lightest food, and he looked as if he could hardly live three months. Under these conditions "Dr. Muldoon," as Sullivan pleasantly speaks of him, took his man and really made him over—made a new man of him, as it were; and this is the way, according to the *Times*, in which it was done:

"After a few weeks of really scientific treatment, and without the aid of drugs, his stomach was restored, so that three chickens, half a loaf of bread, besides wine and other things, were taken at a meal. The household butcher's bill amounted to $100 a week. His muscles became as hard as iron; every morsel of superfluous fat was made to disappear. The force of his blow equaled half a ton; a spin of a dozen miles was regarded as a gentle exercise; his volitional nervous power was apparently inexhaustible, and he has proved himself to be, without the possibility of question, the very paragon of strength, activity and endurance, the realization of perfect physical health."

Well may it be said: "After a few weeks of really scientific treatment," for what could be more scientific than a treatment which could take such a physical wreck and produce such wonderful results? Why would it not be well for some medical college to create a Chair of "Physical Training" and make "Dr." Muldoon or some better man the professor?

This, says a cotemporary, has been a splendid demonstration of what pure physical training, with a carefully selected diet, will do for the human animal. It is said that "Dr." Muldoon is already overwhelmed with applications from men of means who offer him large fees to train off their superfluous fat, relieve them from dyspepsia and other kindred ailments. Every health resort should have a department for physical training and some one well qualified to superintend it.

Statistics of Breathing.

In each respiration an adult inhales one pint of air.

A man respires 16 to 20 times a minute, or 20,000 times a day; a child, 25 to 35 times a minute.

While standing, the adult respiration is 22; while lying, 13.

The superficial surface of the lungs, *i. e.*, of their alveolar spaces, is 200 square yards.

The amount of air inspired in 24 hours is 10,000 litres (about 10,000 quarts).

The amount of oxygen absorbed in 24 hours is 500 litres (744 grammes); and the amount of carbonic-acid gas expired in the same time, 400 litres (911.5 grammes).

Two-thirds of the oxygen absorbed in 24 hours is absorbed during the night hours from 6 P. M. to 6 A. M.

Three-fifths of the total carbonic acid is thrown off in the day-time.

The pulmonary surface gives off 150 grammes of water daily in the state of vapor.

An adult must have at least 360 liters of air an hour.

The heart sends through the lungs 800 litres of blood hourly, and 20,000 litres, or 5000 gallons, daily. The duration of inspiration is five-twelfths, of expiration seven-twelfths, of the whole respiratory act; but during sleep inspiration occupies ten-twelfths of the respiratory period.—*Ex.*

POISONS AS STIMULANTS.—Every virulent poison known to botany or chemistry, says Dr. Felix L. Oswald, can be used for purposes of stimulation. The Yakoots of Northern Siberia fuddle with poisonous toadstools, the Syrian mountaineers with arsenic, the miners of the Peruvian Andes with verdigris, the Chinese and Turks with opium, the Syrians with a decoction of hempseed, the Malays with the acrid juice of the betel nut. In a few starving villages of Dalmatia, foxglove leaves (digitalis) are used for intoxication purpose. The great preference for alcohol for centuries—and even since the first dawn of historic tradition—may be explained by the fact that it is by far the most universally accessible of the virulent stimulants, rather than by any attractiveness of its taste, or by hereditary desires. Even the drunkard's children, contrary to common belief, are nauseated by the first taste of fermented or distilled liquors.—*New York Telegram.*

THE NERVOUS PATIENT.—In the old days the nervous patient was one who met with but little forbearance from others. It was universally conceded to be a matter of the patient's own will; she could be different if she would, and only the more charitable called her possessed. But nowadays it is commonly admitted that the nervous patient is irresponsible, that scolding and reproaching are worse than useless, inasmuch as they are cruel and wicked, and that the only cure for the trouble is complete indulgence and rest, for it has at last been recognized as a trouble, a real trouble, and not a voluntary matter within the patient's control—a case not of fidgets, but of tired and sick and naked nerves that must be soothed and cushioned and clothed and made whole again.—*Harper's Bazar.*

CAUSES BALDNESS.—One great cause of baldness is the habit some people have of changing the style of hair-cutting half a dozen times a year, or nearly as often. They insist on the "short pompadour" in the hottest months, a less pronounced crop in the fall, and then wear their hair longer as the weather gets colder, gradually approaching a shave again by the time the thermometer gets up in the nineties. Now all this may be very comfortable, but it is very bad for the hair and scalp. It is best to wear the hair short all the year round, brush it freely and trust to nature for the only really effective substitute for pomade.—*Barber in Globe-Democrat.*

SACCHARINE AS AN ANTISEPTIC.—We lately referred to the importance of having antiseptic mouth washes and tooth powders in general use. Apropos, we see it announced by a French writer quoted in the London *Lancet*, that six per cent of saccharine dissolved in water is perfectly effective for the mouth and teeth. The next thing is the tooth syringe for searching crevices. A strength of only one in 500 is said to prevent the formation of low organisms—*i. e.*, spoiling—in mucilage, etc.

NEURALGIA OF THE HEART.—What do our homeopathic friends say to this? Dr. Richardson, of London, received a prize of 25,000 francs from the Academy of Medicine in Paris for having discovered an almost infallible remedy for angina pectoris by the administration in small doses of 1 100 to 1-25 of a grain of nitro-glycerine! I know a number of persons who always carry tablets of nitro-glycerine with them.—*Belford's Magazine.*

IS IT SO?—If one side of the nose be closed, as by pressing with the finger, the lungs will not expand equally. It is a curious fact and shows the intimate relation existing between the nostrils and the lungs. The importance of unobstructed nasal passages is also apparent.—*People's Health Journal.*

POISONOUS MACKEREL.—A case of poisoning from eating a mackerel has led to the statement from excellent authority that "the gills of a mackerel undergo fermentation, and that no part of the head or near the head should be eaten after 48 hours of the fish being caught."

USEFUL INFORMATION.

AN ELECTRIC WIRE FENCE.—Speaking of the completion of 30 miles of electric wire fence around the L. X. ranch, the Amarillo *Northwest* says: The current was recently turned on for the entire line, and since then, and from this on, she hums on in wonderful shape and stands a system of practical fencing neither surpassed nor equaled by any other. It is simply one of the wonders of science and is a monument to its inventor. A party had a demonstration of its effectiveness. On one side of the fence stood some dozen or fifteen steers; on the other stood one alone. He undertook to break through and go over to the majority. When he struck that smooth wire fence, he jumped like he was hit at once with forty million hornets, and with his tail coiled over his back he wheeled and only struck the ground in high places. Then the fifteen made a dash to join him. One by one they rubbed that electric fence, and as fast as they did they jumped, kicked and wheeled as though they had urgent business at the North Pole and had only a few hours in which to make it. That electric fence is a stunner. Not one of these cattle was hurt, but not one of them will go near the fence again.

NEW COMPOSITION FOR SOFTENING LEATHER. Dr. Alexander Zoroastroff of Bolostok emphatically recommends to people working about water a grease for boots which is said to completely prevent sore feet, and so protects pedestrians from the whole train of familiar affections caused by that minor accident. The ointment is made of four parts of lard, four parts of olive oil, and one part of caoutchouc (raw rubber), melted together on a slow fire. Having moistened the sole of the boot with water, the inventor warms the boot in a stove or before a fire, and then smears it over with the compound. The boot is said to become soft, pliable, shining, waterproof, and even more durable.

USE OF WATER GAS IN THE MANUFACTURE OF LIME.—The use of water gas in the manufacture of lime is likely to revolutionize the industry in the State of Maine. Limekilns at Rockport are run on this plan and the process is quite interesting. Coal is placed in the bottom of the kiln, in the same manner as in former use of wood, and lighted. A spray of water over the burning mass becomes decomposed, the oxygen entering into the combustion of the coal and its products, while the hydrogen or "water gas" passes into the heated limestone, in the barrel of the kiln, where it is consumed with intense heat, the result being that lime is formed much more rapidly and economically than by the old process and those of wood fuel. An air blast is furnished from a blower driven by a water motor or horse-power. The system is being rapidly introduced, the patentee having manufactured since August, 1888, over 37,000 casks of lime by the new process, at a saving of over six per cent. By the use of "culm" coal a further large gain can be made.—*American Engineer.*

CHINESE PAPER MONEY.—The Chinese made, printed and issued paper money—"greenbacks"—more than 2000 years before the Christian Era. Their earliest issues of this character were known as "flying money," or "convenient money," first issued in China 2697 B. C. Originally these notes were issued by the treasury, but experience dictated a change to the banks under Government inspection and control. The early Chinese "greenbacks" were in all essentials similar to the modern banknotes, bearing the name of the bank, date of issue, the number of the note, the signature of the official issuing it, indications of its value in figures, in words and in the pictorial representation in coins or heaps of coins equal in amount to its face value, and a notice of the pains and penalties following counterfeiting. Over and above all was a laconic exhortation of industry and thrift: "Produce all you can; spend with economy." The notes were printed in blue ink on paper made from the fiber of the mulberry tree. One issue, in 1399 B. C., is all carefully preserved in the Asiatic Museum at St. Petersburg.

A QUEER MINE OF VALUABLE WOOD.—Forty miles above New Orleans is the old bed of the Bonnet Carre Crevasse, says the *Times-Democrat*. Fifteen years ago the Father of Waters burst his bonds and swept through there to Lake Pontchartrain. Five years ago the State of Louisiana, with the assistance of the Mississippi Valley railroad, rebuilt the Bonnet Carre levee, but it could not restore altogether the conditions prevailing antecedent to the crevasse. The river in the ten years it passed through the swamp, piled up its sands against the big cypress forests there. It has left behind a buried forest. The piled-up sand has deadened nearly all the trees, and a shingle-mill is now at work there manufacturing them into shingles with all the rapidity with which that machine works. Wood is obtained in a similar manner on the Atlantic Coast of New Jersey.

ROTARY BAG MACHINE.—The combination American clock-bottomed bag machine will make 120 bags a minute. It works from thin or thick paper, and can be adjusted to make different sizes. The machine is simple in construction, and requires very little power to run it. The pasting and folding are completed automatically. There are but few working parts, all of which are of rotary motions. After the bags leave the machine they pass over a drying cylinder of six feet diameter, which can be heated either by steam or gas, and then the bags are picked up in the space between the machine and cylinder by girls. The bags are carried over the cylinder by means of a felt. The paper is obtained from the mills in rolls of the required width.

WILL RATS GNAW HEMLOCK?—A cotemporary says: "We have heard it said recently that a rat will not gnaw a hemlock board, and that a grain-bin in a stable, if made of hemlock, or lined with it, is as safe against rats as if it were lined with galvanized iron. Whether this is so we cannot say, but some one ought to know about the matter, and if that person will come forward with his information he will deserve the thanks of the building community."

BLANKETS IN HOT WEATHER.—Travelers on the hot plains of Siberia keep cool by wrapping themselves in thick blankets. When the temperature there reaches 118 and 120 and over, travelers, it is said, wrap themselves in two heavy blankets and cover their limbs with thick pillows on the side next to the sun to prevent the blistering of the body and from becoming sick and nauseated at the pit of the stomach.

A NEW CEMENT.—A stone has been discovered in Japan which has remarkable qualities as a cement material, and can be worked up for a much less price than the imported article costs. The cement will bear a weight of 400 to 500 pounds per square inch.

LIVE CATTLE FOR EUROPE.—All the outgoing steamers from New York and Boston for the next three months are secured to convey live cattle to Europe. Although export rates are high, the trade is yielding a good profit.

LONG RANGE GUNS.—Ten and three-quarters miles is the range that the French have obtained for the 43-ton gun, 35 feet long, with an 800-weight projectile and 425 pounds of powder.

THE Union Pacific road offers $2000 cash to any passenger on any train that will shoot a train robber, and several parties are making frequent trips in hopes to get a shot.

THE first grindstone ever seen in Madagascar was left by an American vessel a year ago, and the Queen rewards heroes by allowing them to turn it while she sharpens her ax.

ELECTRICITY.

Three Miles a Minute.

The Baltimore *Sun* gives a description of a remarkable invention which will be known as the Weems Railway System, and which, if it proves successful, is destined to revolutionize the method of carrying letters and light freight between the principal cities. A company has been formed and incorporated in Baltimore, with an abundance of capital, which has secured 143 patents to cover all its various devices, and which proposes to operate an electro-automatic transit device for the rapid transmission of letters, newspapers and small parcels. The device consists of an electric-motor car and any desired number of other cars to form a train.

The motor car is 18 feet long and 2½ feet square at each end. It is pointed in front, the wedge or point being below the longitudinal center, adjusting it to the air pressure, thus keeping the car down to the track. To reduce atmospheric friction to a minimum, all wheels and electrical appliances are placed within the walls of the cars. The road is to be built with a track of 24 inches gauge, and will cost about $5000 per mile. It may be constructed either above or on the ground. It can be built with greatly varying grades and curves. The entire train will be built in telescope form, so as to leave no projections or uneven surfaces to impede swift passage through the air. The rear end of the rear car is pointed in a similar manner to the front of the motor car, thus preventing any suction as the train rushes on its way. The motor may pull one car or a train of cars.

All trains will be controlled from a generating station, where will be placed an electrical generating plant. Electrical brakes are to be used, and trains are started, stopped, speed lessened and backed at will from the station. Special electrical appliances will inform the operator in charge of the generating station of the exact location of the train from the time it leaves or passes any given point until it reaches its destination. It has not yet been determined how far apart the generating stations shall be placed. Possibly 100 miles may not be out of range, as the current can be run for 50 miles each way from the station as a center without much loss of electricity.

A series of experiments have been made at Laurel, Md., to show what the Weems railway system will do. This experimental line is a circuit of exactly two miles. Over this route there are 29 changes of grade, some of them very heavy, even to the extent of 108 feet to the mile. The generating plant there contains all the electrical appliances necessary to the attainment of high speed by a railroad train. There is also special machinery for experimentation, and the perfecting of all mechanical and electrical inventions, tending to advance and improve the system. All tests of speed have been made upon heavy grades and curves combined, too great ever to be required in the construction of a commercial line, therefore the experiments demonstrate the high rate of speed which may be obtained upon lines built for business purposes. At this experiment station two miles per minute are made around a heavy curve, or the equivalent of 180 miles an hour, or three miles a minute, on a level track. Prior to the inauguration of this system, 20 miles per hour was the fastest time ever made by any kind of electrical railroad travel.

The cigar-shaped car, painted a bright red and moving sharp end foremost, at first sight does not seem a wonderful thing as it goes quietly along the track, but later, when the engineer at the dynamo puts on more power, or as a steam-car man would say, more steam, and the creeping thing hastens its movement until it fairly flies and becomes a moving streak of red, spectators feel the progress being made in applied science and talk of the wonders of electricity and the great things it will accomplish in the active affairs of life in the near future. All who have witnessed the successful trials at Laurel are impressed with the great stride made in the matter of rapid transit by electricity. Edison, who has been a witness to the experiments, pronounces it the greatest electrical conception since the telegraph. Wherever it passes along the surface of the ground, the road will be fenced in with barbed wire to keep off cattle, and, being insulated, the wires will be used for telephoning and signaling along the line. It will soon be able to handle perishable freight in comparatively large quantities. The mails may be carried from New York to San Francisco in 24 hours, with plenty of time for necessary turnouts and other delays.

The advantages of this system are not alone in its speed, but in the economy and frequency with which trains can be dispatched. In addition to all these things, it will save interest on remittances at long distances, will bring the people closer together, and will create new enterprises. Its developments will create new fields of usefulness not now thought of. Such, in brief, are what the persons interested in this invention claim for it.

Arrangements are already being made for the building of an extended road between distant cities, and Baltimore will be one of the stopping-points on the line.

A NOVELTY in the application of electricity to musical instruments has lately appeared in Germany, by which a movement of electro-magnets changes the timbre of the tone.

MINING AND SCIENTIFIC PRESS

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Our latest forms go to press on Thursday evening.

SAN FRANCISCO:

Saturday, August 17, 1889.

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See Advertising Columns.

Passing Events.

The mining associations of Utah and Colorado are passing resolutions asking that the importation of lead ores be stopped, and the Southwestern Mining Association, at El Paso, "resolve" just the opposite. The latter say they want fluxing ores to mix with the dry and refractory ores of Texas, New Mexico and Arizona, and that their smelting interests will be destroyed if the Mexican ore is kept out or made to pay duty.

The powder manufacturing companies of this State have made an agreement which advances prices in their products.

They are having a water famine in Montana, and a number of mills have closed down in consequence. The loss on herds will be great also. The whole world seems to have a surplus of water except up and down the region between the Rocky and Sierra Nevada mountains.

Connecticut capital has organized the Nevada Copper Co. to mine the copper at Luning and commenced work.

Every one is discussing the shooting of the notorious David S. Terry by a deputy U. S. Marshal who had been detailed to protect Judge Field from anticipated assault. Terry struck Field in the face in the eating-house at Lathrop, and was immediately shot dead by the marshal. As has often been predicted, David S. Terry died with his boots on. Thus another event worthy in its sensational features of the old California days has been consummated. Such things are no credit to the age.

The International Geodetic Association.

By an Act of the last Congress, the United States became a supporter of the International Geodetic Association by appropriating the sum of $450, which will be repeated annually for the next nine years. This membership entitles the Government to one delegate to attend the meetings of the association in Europe, and one of the last acts of President Cleveland was to appoint Prof. Geo. Davidson of the U. S. Coast and Geodetic Survey as the representative for the country.

The Geodetic Association was organized many years since in order that the few eminent geodesists might interchange their views and experiences, and influence the different Governments of Europe to adopt the best modern methods and the finest instruments of precision in covering the older work of the European States with a larger and controlling network of triangulation and of telegraphic longitudes. Within a few years the association has reached a higher organization and is now maintained by subscriptions from each Government.

The commission meets in different cities of Europe, just as the American Association for the Advancement of Science meets in different cities of the United States.

This year the commission meets in Paris on the 2d of October at one of the departments of the Government. The members of the permanent commission will exhibit the fruit of their labors since the last meeting in the astronomical determinations of longitude, latitude and azimuth; in the levelings of precision through Europe and the results obtained from self-registering tide gauges, in determinations of gravity from pendulum experiments and local deflections of the plumb line occasioned by the proximity to mountain masses, or by denser masses below but near the surface of the earth. On these points the United States Coast and Geodetic Survey will be able to report a main triangulation nearly finished across the continent from the Pacific Coast to the Atlantic, on the parallel of 39 degrees, a network containing larger triangles than those of any other country, with sides reaching as much as 192 miles in length. In this triangulation special observations have been made by Prof. Davidson that have been pronounced "unique in the history of geodesy."

The work of telegraphic differences of longitude has been carried on with all the refinements of the best methods and instruments and with the experience of the best observers. In the recent determination of the longitude of the telegraphic longitude station near Verdi (for the establishment of the 120th meridian) the result differs only two-thousandths of a second of time from that determined by Prof. Davidson in 1872. Work of this character cannot be surpassed.

In the measurement of base lines, the practice of the Coast and Geodetic Survey is broadly and largely different from that of Europe. Where the practice is to measure short bases in this country, and especially on this coast, the two principal base lines are each ten and four-fifths miles long; that in Yolo county was measured twice, and that in Los Angeles county, three times. From some preliminary calculations it is believed that the probable error on the Los Angeles base will be about a quarter of an inch, which means that there is a probable error of one foot in the measure of 2,700,000 feet.

From these long bases, there are few steps in developing the geometrical figures to the largest dimensions practicable through few triangles. This is a very important consideration, because the increase of error is largely found in the measures of the horizontal angles of the different triangles.

Prof. Davidson will probably make a communication to the commission upon the status of the work upon this coast, and its prospective extension in a series of great figures along the chains of the Coast and Sierra Nevada and Cascade mountains; upon the methods of work in the mountains; the economy of the Coast Survey organization; and the direct and practical value of the results to the States in their respective surveys, and to commerce and navigation in the execution of the topography and hydrography of the seaboard.

The publication of the charts of the Survey show that nothing can be superior to such as we have for San Francisco. The publication of the "Coast Pilots" for the benefit of the navigator is a feature not undertaken in the geodetic operations of Europe. To this may be added the study of the ocean currents and the fauna and flora of the Atlantic and Gulf of Mexico, as exemplified by Alexander Agassiz in his "Three Cruises of the Blake," a Coast Survey steamer.

With a practice of more than 44 years in the field, from Newfoundland to the Gulf of Mexico and from Panama to Alaska, we may expect that Professor Davidson will represent the progress, efficiency and usefulness of the U. S. Coast and Geodetic Survey. He has orders to leave for Washington on the 25th of the present month for conference with the superintendent, and he expects to visit the observatories of Greenwich, Paris and other cities. He will take with him some of Watkins' large photographs of the stations of the Survey in the high Sierras to illustrate some of the difficulties that have to be overcome by the triangulation parties. Unless detained in Washington on his return, he will be in San Francisco by November 1st.

Milling Gold Ore.

The Suffolk Gold Quartz Company operates the Smyth mine, in Angels district, Calaveras county. The ore is run over a tramway from the mine to the mill by use of a car and carman, and the expense of transportation is 20 cents per ton. The ore is free milling, with a very large percentage of sulphurets of various kinds, including copper pyrites. Considerable gangue on the footwall is gold-bearing and carries sulphurets. One character of ore seems to be a gold-bearing talc, another a mixture of diorite (greenstone) carrying free gold, and highly charged with sulphurets. The ore is sometimes amalgamated in the battery, and sometimes not, according to the nature of the rock. In either case the amalgamation is on outside electroplates and afterward in a shaking table of peculiar construction, and illustrated in the drawings on page 121, which are taken from the report of the State Mineralogist. Sometimes some of the ore is worked in a kind of arastra, but usually amalgamation is completed on the shaking table, which has a silvered plate on the discharge side, on which a spray of water strikes.

The mill contains five stamps, of 600 pounds each, which are given a drop of from four to six inches, 80 times per minute. The mill has a capacity of crushing 10 tons in 24 hours. The shoes and dies are white iron. Three hundred tons of ore wear out about 400 pounds of iron, representing a weight of 1⅓ pounds of iron to the ton of ore crushed. At 4½ cents per pound for iron the wear of shoes and dies is six cents per ton of ore crushed, the lightness of wear indicating a soft rock. The battery requires about one miner's inch of water. Nos. 9 and 10 angle-slot screens, 6x44 inches inside the frame, are set vertically. The discharge is four inches above the die, and increases to seven. The apron is 48x54 inches; the sluice 8 inches in width and 20 feet long, inclined 1½ inches to one foot, and silver plated.

Two plates are used inside of the battery, one on each side, 44 by 3 inches and 44 by 6 inches respectively. The Stanford self-feeder is used. When the ore is amalgamated in the battery, 60 per cent of the value recovered is saved inside, about 25 per cent on outside plates, and 15 per cent on shaking table, though for one month one-third of the gold was saved in each place. The percentage of sulphurets varies from one to ten, principally iron and copper pyrites associated with arsenic. They have a value of about $50 to $100 in gold and $1 50 silver by assay, and are saved in riffle sluices. They are worked at chlorination works, where 90 per cent of the assay value is allowed and $20 is charged for treatment. Cost of milling per ton: Labor, 55 cents; water, 20 cents; shoes and dies, 6 cents; incidentals, 29 cents; total, $1.10.

IT is reported that the 12,000 acres of land owned by the California Steel & Iron Company about Clipper Gap will soon be placed upon the market and sold off in small farms.

A Piece of Nature's Sculpturing.

In the outlines of a rock, a crag or a mountain, there are often seen resemblances to the human face or form, or the shape of some animal or familiar object "graven by art and man's device." Such instances of nature's sculpturing are the subject of an entertaining illustrated article by Dan De Quille in the August *Overland*, from which, by courtesy of the publishers, we borrow the accompanying picture, (see page 121,) and description of

The Stone Elephant of Inyo.

No one will ever be in doubt as to whether Nature intended it to represent an elephant, a buffalo, a rhinoceros, or a hippopotamus. In most cases it is necessary to take a particular stand at some distant point when viewing such freaks—distance lending illusion quite as readily as "enchantment;" but the elephant rock of Inyo is still an elephant, whether we are a mile away or stand directly by its side.

The stone elephant is situated four miles west of the village of Lone Pine, Inyo county, California, on the road to Mount Whitney. It stands at the mouth of a large dry canyon, amid low, broken, and rocky hills, destitute of all vegetation except sagebrush. It is about ten miles east of Mount Whitney, which is hidden by the mountain range seen in the distance.

The rock that has taken the elephantine form is a dark gray granite that is almost the color of the skin of an elephant. The stone elephant is about 25 feet in length by 15 feet in hight. Those who see it for the first time mistake it for a petrifaction, until they find on drawing near that it is composed of granite. The first discoverers thought, on catching sight of it, that they had found a petrified mastodon.

An old Piute Indian, on being asked about the freak, said: "Yash, me see him many year 'go. Long time Injun no sabe him; now see him all same in big show up Virginny City."

Small Pelton Water-Motors.

The well-known Pelton wheel is made in a variety of sizes, but it is only within a short time that a very small one has been manufactured. The Pelton Water-Wheel Company of this city now, however, makes a 12-inch motor, weighing 75 pounds, and costing $50; and a six-inch one, weighing 25 pounds, and costing $25. These prices include a stop valve, driving pulley, and three interchangeable tips of different sizes to give such variation of power as may be desired.

The little six-inch motor will give with the pressure from the San Francisco mains within a fraction of a horse-power, and more power with increased head. The cut on page 121 shows the form in which the motor is arranged ready for use. The bed plate is bolted down and the top casing put on, covering the wheel in; the whole is then ready for pipe connection. These small wheels are of the same general design as the large ones and are carefully made.

For small power this is a very convenient appliance. There are many places where a spring or small stream could be utilized (sufficient head being secured) to run various kinds of light machinery by day and a dynamo at night, furnishing light for the house and outbuildings at nominal cost.

In cities and towns where water can be had from street mains, the motors are found most useful in running printing presses, lathes, and a variety of other machinery. But a small amount of water is needed for a very considerable power with a good head or pressure. These small motors are destined to come largely into use, being very inexpensive and efficient.

HON. A. F. PARKER informs the Boise *Statesman* that the alleged discovery of new placer diggings beyond Warrens, in Idaho county, "is a barefaced fraud and an 18-carat bilk," and that the excitement was only gotten up in order to enable the promoters to sell whisky. The location of the alleged discovery was on Lost creek, a tributary of the middle fork of Salmon river, in the vicinage of Yellow Pine Basin.

"THE mining knowledge of the superintendent is often found in the head that fills the foreman's hat."

The coal mines at Timberline, M. T., are being operated by C. W. Hoffman under a lease.

Classification of Imported Ores.

The delay of the Treasury Department in ruling on the classification of imported ores is doing great injury to the lead-mining interests of this country. This industry is a very large one, and to protect it Congress levied a duty of 1½ cents per pound on lead ore. This provision of the law is nullified by a ruling of the Treasury Department under which such ores come in free of duty when their silver contents exceed their lead contents in value, and under this ruling some 50,000 tons of lead were imported free of duty in 1888. The ruling was resisted by the lead miners in that year, but without effect. In May last delegates from the lead-producing States and Territories were given a hearing before the Treasury Department, at which time all the facts were elicited, so that the Department is not in ignorance of the injury being done to the industry. Action is still delayed, however. Lead ores are being largely imported from Mexico and Canada, and a surplus of lead and lead ores is being accumulated, which will depress prices for a long time. American mines are closing down with great loss and thousands of American miners are being thrown out of work.

The Utah Ore-Producers' Association held a meeting the other day, made a statement of these facts and adopted the following resolutions:

Be it Resolved, That we urge upon the Treasury Department that if it intends to give relief to this great industry, such action should be taken at once as will assure protection against the ores mined by peon labor; and, further,

Be it Resolved, That we hereby appeal to the President of the United States and the Honorable Secretary of the Treasury to hasten such measures as will give to American mines and miners the protection accorded them by law, and we impress upon them the fact, that continued delay will be nearly as fatal to American mining as a ruling which would give free trade in ores with Mexico and British Columbia.

The great difficulty is on the Mexican border, where most of the ore comes in. It is well known, however, that several of the great smelting plants depend largely on this imported ore, and are thriving at the expense of the lead miners. The owners of these works evidently have more influence than the miners, or the custom would have been stopped long since. The longer they can put off a reversal of the ruling, the more ore will they get to work. The Idaho miners are suffering also from the importation of ores from British Columbia under the same ruling.

Comstock Ore and Bullion.

The mines on the Comstock produced during the last quarter $1,250,000 as against $1,300,000 the previous quarter. The following figures for the last quarter are taken from the sworn statements of superintendents, now on file in the assessor's office:

Con. Cal. and Virginia produced 36,286 tons of ore yielding a total of $725,529.03 in bullion; average yield per ton, $20; actual cost of extraction, transportation and reduction, $497,202.32; net yield above cost of production and subject to bullion tax, $228,326.71; total bullion tax on net proceeds, $6849.80.

Confidence produced 1602 tons of ore yielding bullion valued at $27,111.89; yield per ton, $17; actual cost of extraction, reduction and transportation, $35,526.47; cost of production above yield, $8414.58.

Yellow Jacket produced 8434 tons of ore yielding bullion valued at $175,386.74; average yield per ton, $20; cost of extraction, reduction and transportation, $155,517.12; yield above production, $19,869.62; tax, $596.08.

Challenge produced 413 tons of ore yielding bullion valued at $7636.13; average yield per ton, $18.50; total cost of extraction, reduction and transportation, $14,954.18; cost of production above yield, $7318 05; no tax.

Alta produced 1817 tons of ore and 40 tons of concentrates yielding bullion valued at $34,967.29; average yield per ton, $19; cost of production above yield, $5892.15; no tax.

Chollar produced 4271 tons of ore yielding bullion valued at $68,626.85; average yield per ton, $14.40; actual cost of extraction, reduction and transportation, $108,593 03; cost of production above yield, $39,966.18; no tax.

Six-Mile Canyon—Ore worked at Hully's stamp-mills in Six-Mile Canyon produced bullion valued at $3200; total cost of reduction, $3070; yield above cost, $130; tax, $2.60.

Recapitulation—The total number of tons of ore extracted during the above quarter, according to the above statement, was 53.363, producing bullion valued at $1,042,327 94. The total product of the Savage, Hale & Norcross, Justice, Overman and Crown Point, not included in the above list, will swell the total to $1,250,000. The bullion product of the lode during the quarter ended March 31, 1889, was $1,300,000.

Occurrence of Nickel.

EDITORS PRESS:—Will you be so kind as to let me know what the matrix is of nickel, or what formation it is found in?—R.

The ores of nickel occur, in moderate quantity, in close association with chrome ores, in the serpentine rocks, from Canada to Maryland, and equally so with the chrome ores of the Pacific Coast, notably in Oregon. Dr. T. Sterry Hunt long ago pointed out the general diffusion of nickel throughout the magnesian rocks of the Quebec group. The serpentines of many regions contain chromium and nickel. The most abundant ore of nickel, according to Prof. W. P. Blake, is in the form of a mixture with pyrrhotite or magnetite iron pyrites, which is found more abundantly in the older crystalline rocks than in those of later formation. This form of nickel ore occurs in many places in this country, but seldom averages over two per cent. The presence of nickel in the serpentine rocks of Pennsylvania, associated with chrome ore, is well known by the beautiful green crusts on the massive chromite quarried there. These green crusts, known as "Emerald nickel," are derived from infiltration from small granular nodules of nickel sulphide. Similar coatings of emerald nickel occur upon the chrome ores of Southern Oregon. This ore of nickel, though rich in the metal and very desirable, is not abundant enough to work, and has not been utilized except for cabinet specimens.

The most available ore of nickel, and the only ore worked to any extent in the United States, is the sulphide, occurring in connection with magnetic pyrites. This is an ore which occurs at many places along the lines of the older Archæan rocks.

The ore at Douglass county, Oregon, is found in bunches and pocket-like accumulations in serpentine with chromite.

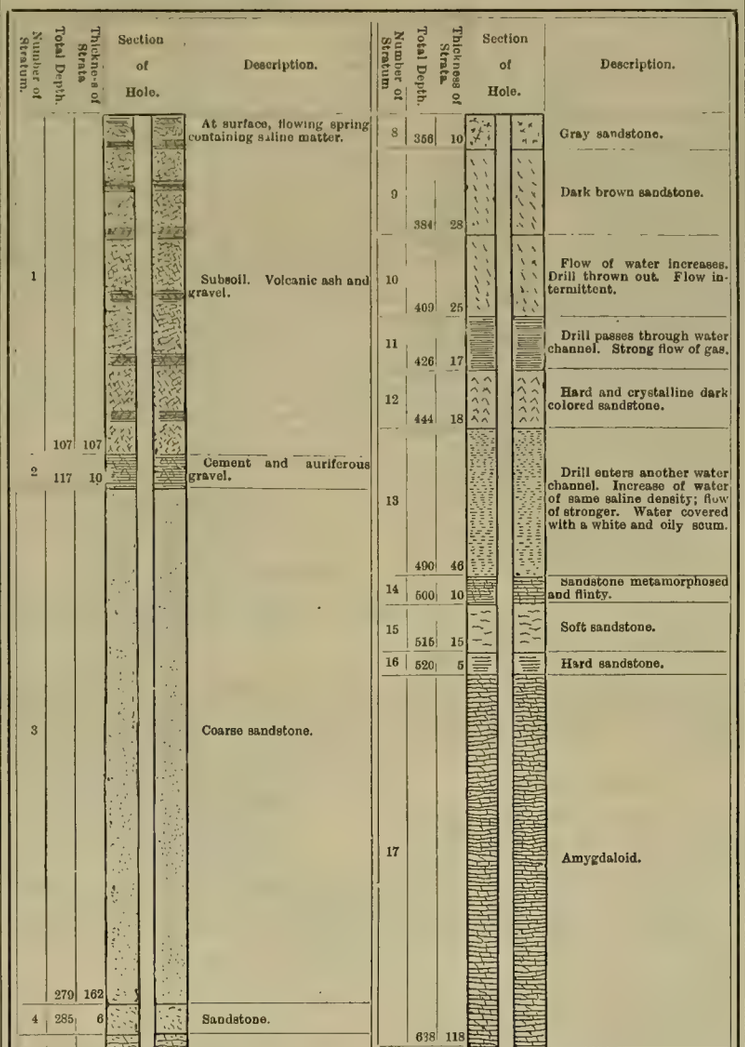
At New Caledonia the ore known as garnierite is a hydrosilicate of nickel and magnesia. The island is made up of more or less decomposed eruptive rocks, among which the serpentine plays the most important part. The nickel ore is always found in the lodes of serpentine.

At Webster, Jackson county, North Carolina, a silicate of nickel is mined. Its occurrence is thus described by H. J. Biddle, after a careful examination at the instance of the U. S. Geological Survey: "Near Webster is an area of olivine rock (dunite or sherzolite). The rock contains grains of chromite scattered through it nearly everywhere. Throughout most of the area the olivine rock near Webster has been changed to a light-green serpentine, in which are veins or pockets of chromite and veins of talc, and other minerals usually found in serpentine. There are at many points streaks of deweylite and a nickeliferous mineral, which is genthite or some allied species. This occurs in thin streaks. In places it fills all the joints and fissures, but is usually but a thin film." In addition to the above, it appears that nickel is also frequently found in North Carolina in the auriferous sulphides, somewhat in the same manner as in the nickeliferous pyrrhotite of Lancaster Gap, Penn.

According to Mr. W. Q. Brown, nickel occurs on Upper Dads creek, Douglass county, and near Rock Point, Jackson county, Oregon, in veins of pyrrhotite, associated with copper pyrites, and the ore contains a small amount of cobalt. The mines at Nickel mountain, three miles west of Riddle station, on the California & Oregon railroad, show beds of ore. The ores are invariably found either in boulders disseminated through a highly ferruginous earth, or in a stratified bed underlaid by an altered serpentine. Nothing like vein formation has been encountered. Occurring with the nickel ores is chrome iron or chalcedonic silica. A specimen of the unaltered country rock from Nickel mountain was determined by George P. Merrill of the National Museum at Washington, as chiefly olivine, with a mineral of the pyroxene group, probably cronzite. The nickel silicates found near Webster, Jackson county, N. C., are the result of the decomposition of an olivine rock, and the occurrence in Southern Oregon can be similarly explained. The association with chrome ores adds to the analogy between the two occurrences.

Prof. F. W. Clarke has further substantiated the view advanced by Mr. Biddle as to the genesis of these silicates of nickel, and has extended the comparison to the silicates from New Caledonia.

In Saline county, Arkansas, near Benton, 23 miles south of Little Rock, the nickel ore millerite is found in commercial quantities. It runs 54½ pounds nickel to the ton of rock. The vein which bears the nickel is white quartz, running through slate. The deposit is reported as a fissure vein. Besides the nickel there are cobalt, silver, gold (only a trace), iron pyrites and galena. In two of the shafts no galena was found, but only millerite, but assays gave nearly always silver from a trace up to 6½ ounces. In the third shaft galena was struck with the millerite and assays 30 ounces of silver. The mine is on a silver-bearing belt which stretches from the Kellogg mine, north of Little Rock, in a southwesterly direction through the State. The granite crops out in places in Saline county.



SECTION OF ARTESIAN BORING IN SHASTA VALLEY BASIN.—See page 123.

CRUSHING.—Messrs. James Leffel & Co., Springfield, O., report a brisk demand for their improved Leffel turbine water-wheels. They are not only valuable motors for furnishing power for mining plants, but also find a vast field of usefulness in the other great industries. We notice the company have recently shipped to the Marquette Electric Company, located at Marquette, Mich., a pair of 40-inch twin Leffel water-wheels which will be used to develop 350-horse power.

THE PELTON WATER-WHEEL.—The Pelton Water-Wheel Company report great demand for their wheels from all parts of the country. Five have recently been furnished to the Giant Powder Company for their new works at Clipper Gap; four have gone to Colorado, three to Idaho, three to Montana, and various orders are in hand from Alaska, China, Japan, Central America and other distant parts.

AN ASTEROID.—The director of the Lick Observatory is notified by telegraph of the discovery of an asteroid by Charlois, at Nice, on Aug. 3d, at 11 hours, 48 minutes, Greenwich time. Its position was R. A. 21 hours, 23 minutes, 24 seconds; and December, 13 degrees, 4 minutes, 22 seconds. Its motions were west and north 41. Its magnitude was 13.

AT the new Occidental mill, on the Comstock, the pulp from the batteries all flows over the Frue concentrators. The concentrates drop from the tables into a receptacle and the residue of the pulp flows into the tanks and is then transferred to the amalgamating pans. By this double process the ore is worked up to within 15 per cent of its assay value.

"WALLS doubtless influence the pay that is found between them, but the poorest pay a miner finds is within the four walls of a saloon."

Assaying Notes.

[NUMBER 2.]

Testing Silver Ores.

To learn, in a simple way, whether the ore you find contains silver, grind a few ounces of the ore to powder between two rocks; add to it about one-tenth as much salt and about half the quantity of sulphate of iron, often called copperas; mix all together and put it into an old shovel or frying-pan which should have been previously smeared with clay or mud and dried; then roast it over a fire, being careful to stir it often with a piece of stout iron wire. Let the roasting proceed quite gently so long as a smell of burning sulphur can be perceived, not allowing the heat to exceed a dark-red, as seen at night. When the fumes of sulphur cease, let the heat increase to a rather light red, but not so as to melt the ore, stirring it still with the wire.

The smell will now be that of chlorides, rather pungent, often sweet as of new hay, but very easily distinguished from that of sulphur. The ore will swell and appear woolly and somewhat sticky, and a few minutes of this hotter roasting will finish it well enough for your purpose. Now transfer the roasted ore to a flat rock and let it cool; add a little more salt and enough water to make it like mortar; imbed in the mass a strip of clean sheet copper, and let it remain ten minutes; take the copper out, and without touching the part that has been in the pulp, wash the mud off it with clean water. If the ore contains silver, it will invariably show as a white coating on the copper, and as no other metal will so coat the copper under these conditions, the appearance of such a coating is proof positive of the presence of silver. The white coating will be heavier or lighter, according to the richness of the ore. If very heavy, it will appear gray and rough.

In making the above test you will require salt, sulphate of iron, an old shovel or frying-pan, a piece of stout iron wire and a strip of sheet copper about six inches long.

By making a few tests in this way with ore which is known to contain silver, confidence will be acquired. The sulphate of iron is not required if the ore contains sulphurets, but as you may possibly be deceived on this point by substances resembling sulphurets, it is best to make sure by using it in every case.

Many, in fact, most silver ores, will indicate the presence of silver by simply mixing about an ounce with boiling water, salt and a little bluestone in a teacup, and placing the strip of copper in it for a few minutes, while keeping it at a boiling heat; and as this is simpler than the roasting, it is well to try it first. If the copper becomes whitened you may be sure you have silver, unless indeed it should be quicksilver, which, however, you will hardly meet with in the silver regions, and which is easily known by slightly heating the copper in the fire, when quicksilver will be driven off, but silver will not. Most miners will find no difficulty in distinguishing between the two by simply rubbing with the finger. For this test you will require salt, bluestone, a strip of copper and a teacup, or a basin which can be set on the top of an empty oyster can, in which a little water is kept boiling so that the basin with its contents is kept hot. This test has been tried with many samples of silver ore and it has never failed. Yet the first one is still more certain.

Some prospectors test ore by heating a small piece red hot and then plunging it into water, when the more fusible metals it may contain appear on the surface in the form of globules. This method is not reliable, because other metals besides silver show themselves and either be mistaken for silver when it does not exist, or disguise it where it does.

The most generally known method of testing for silver is by acting upon a little ore powder in a test tube with nitric acid, and adding salt to the clear solution thus formed. If the silver is present, it appears as a more or less dense cloud, or if in a very small quantity, as a slight milkiness in the acid. This method is open to two objections. In the first place, some of the richest ores of silver are not acted on by nitric acid, and would, therefore, show no sign on addition of salt; and in the second place, lead gives the same appearance as silver, as does also quicksilver, and though an expert would easily distinguish one from the other by further tests, yet these defects render the method unsuitable for the common prospector, besides which, nitric acid is not a very nice thing to pack with provisions and blankets, nor to handle in the desert.

These tests we take from C. H. Aaron's "Testing and Working Silver Ores," published by Dewey & Co. As will be seen from these brief extracts, the little book is a very practical one, written so as to be understood by common miners and prospectors. The methods of testing for a process are described, and also the various methods of working silver ores.

Pliocene Deposits of Siskiyou County.

The following is a letter to Jas. H. Crossman, the author of the articles on the "Northern Counties of California," now being published in the PRESS:

COTTAGE GROVE, Siskiyou Co.

Friend Crossman: I received by last mail the receipt for subscription and back numbers of the MINING AND SCIENTIFIC PRESS. I have read your articles with interest and pleasure, and if you go on and write up fully there should be certainly material enough for a special edition of some kind, which ought to sell well among people living in the section described.

The Pliocene deposits of this county ought to be thoroughly prospected. Only the outskirts have so far been seen. It will probably be some years yet before they will be opened by miners. The State ought to take a hand.

I have been thinking over the subject since reading your articles in the PRESS, and have arrived at the conclusion that not one, but several, cataclysms occurred before it subsided. First, the mastodon bones in the clay formation; second, the immense gravel-beds lying on the clay. The action that caused the deposit of clay could not have been the same as that which deposited the gravel. How often has the topography, grade, etc., been changed?

The more I study on the subject, the more I am confirmed in my crude theory of upheavals. No other theory affords an explanation. Look at the bedrock on the slope toward the streams. It is always rough. I never saw any signs of a wash, while that on the slope the other way (into the channel) is invariably polished. And the rim rock that defines the channel in every instance—if a gradual subsidence was the order, how does that always remain in place? Whether caused by upheaval or otherwise, the change was sudden.

The volume of water in the river is about as small as it gets to be, and is falling every day. If the bed was not filled or raised by detritus, there would be some good pickings, but the water is on a higher level than it was some years ago. Yours, E. C. GOODWIN.

Local Jealousies.

A stranger will often see and learn more of a locality in a week's visit than a man who has always lived there. This may seem untrue, but think a moment: when we know we can visit a noted spot we are apt to neglect it until such delay becomes chronic, whereas, if we are tourists and never expect to return, we are determined to see all during our short stay. One thing that visitors to California notice is our lamentable local jealousies. Instead of working for our State and being content if we attract good settlers here, we seem only to care for our own burgh and in decrying our neighbor's faults we merely draw attention to our own disadvantages, and finally the intending immigrant leaves us in disgust for his old home. Our State is large, its attractions varied; let us not divide it, but let the California of '99 be the same, except for the progress which we could not check if we would, as that which greeted the gold prospector of '49. San Diego has a fine harbor; San Francisco should rejoice that the endangered mariner has a safe retreat. Mexicans may lack the enterprise of Yankees, yet the day will come when our border city will be populous. This, however, should not make Los Angeles lose that temper which the "Queen of the Angels" should always have. If her Southern sister have the advantage of a natural harbor she is a railroad city, and after the last "boomer" has disappeared from her streets she can calculate on a healthy growth. Oakland need not be jealous of the Bay City; instead of deterring would-be residents she should encourage them. Whatever helps one city helps the other; united they stand but divided they fall. Why should Napa and Santa Rosa be enemies? They are in different counties, and although the vineyards of each are celebrated we fail to see how either can be benefited by underhand slander. If the Eastern man intending to settle in Napa county be driven away for fear of phylloxera, it does not follow that he will be attracted to Sonoma; on the contrary he will probably determine to have nothing to do with grapes. Let us turn over a new leaf, although it be a long way from New Year's Day, and work for our whole State. We need population; this will give us better home markets and we shall not be at the mercy of Chicago. Anything that helps one part of the State benefits all, just as the arm gets strength from the food which pleases the taste of our palate.

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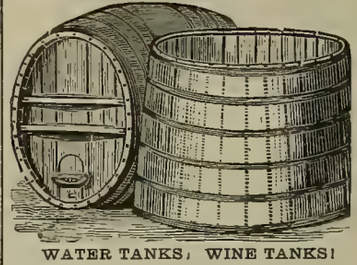
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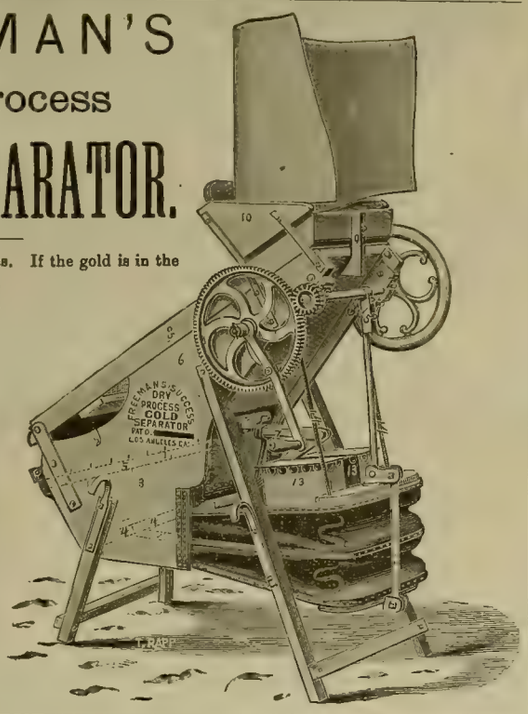
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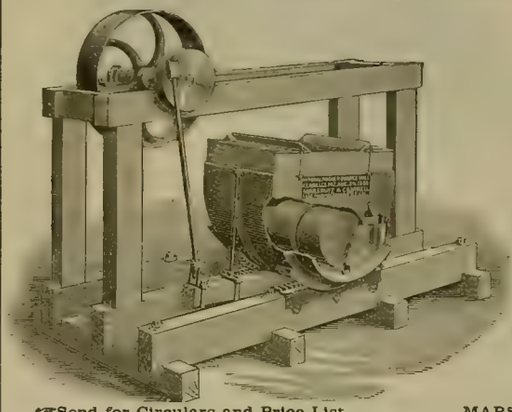
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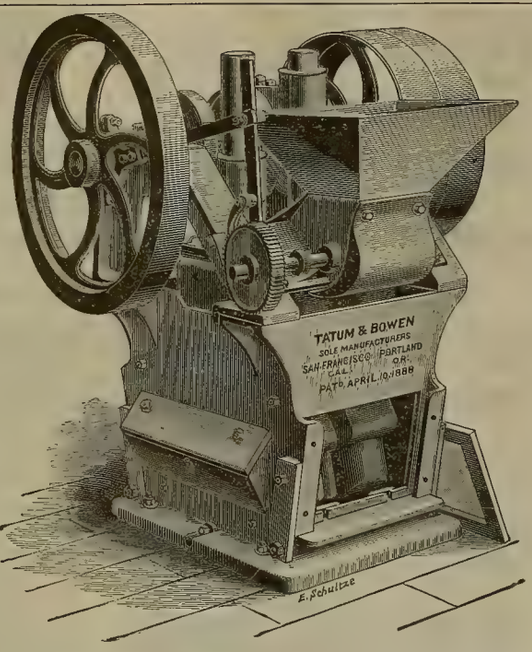
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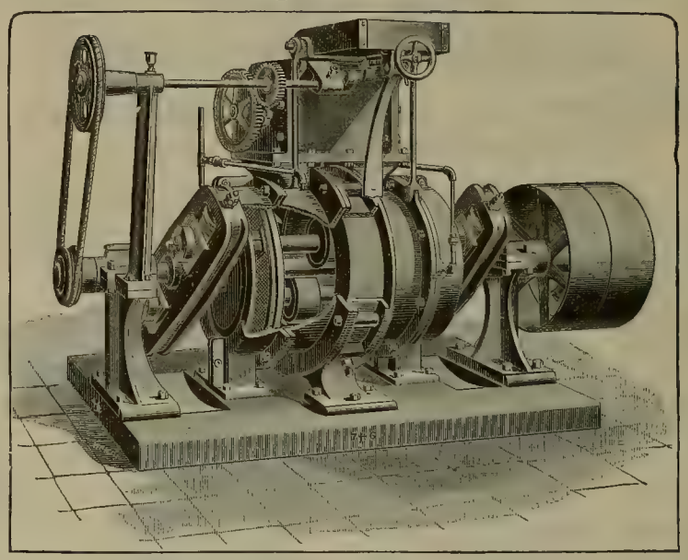
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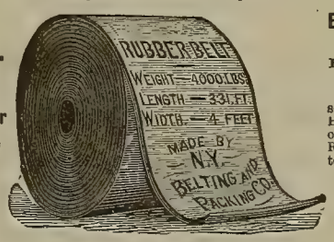
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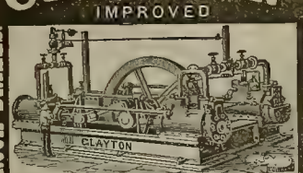
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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

From the official report of U. S. Patents to DEWEY & Co.'s Patent Office Library, 220 Market St., S. F.

FOR WEEK ENDING AUG. 6, 1889.

408,398.—HARVESTING MACHINE—James H. Adamson, North Melbourne, Victoria.

408,400.—STEAM MOTOR FOR PUMPS—H. O. Beatty, Sacramento, Cal.

408,406.—WATER ELEVATOR—A. H. Elfers, Phœnix, Ariz. Ter.

408,407.—PACKING FOR STUFFING-BOXES—Ensign & Wright, Berkeley, Cal.

408,608. REMOVING VERMIN FROM PLANTS—E. P. Fowler, National City, Cal.

408,409.—HOSE COUPLING—W. W. Hanscom (deceased), S. F.

408,617.—SUPPLY AND WASTE COCK—Clark Hay, Portland, Or.

408,237.—ROLLER BEARING—R. W. Hent, S. F.

408,482.—OAR—H. F. Hicks, Ashland, Or.

408,412.—HEADER AND THRASHER—Benj. Holt, Stockton, Cal.

408,413. — TRAVELING THRASHER — Holt & Draper, Stockton, Cal.

408,623.—MOLD FOR ARTIFICIAL STONE FENCES—J. & H. Jessen, Santa Ana, Cal.

408,417. — COUNTER-SHAFT, ETC. — P. H. Kroncke, Santa Rosa, Cal.

408,246.—CARTRIDGE SHELL—W. R. Lindsey, Arcata, Cal.

408,351.—GATE—L. W. Loughary, Monmouth, Oregon.

408,421.—VEHICLE BRAKE—Jno. Mani, French Gulch, Cal.

408,434.—HOSE COUPLING—Jas. Pringle, Silver King, Ariz. Ter.

408,356.—GAS ENGINE—D. S. Regan, S. F.

408,525. — TIDE-POWER — J. Ringen, Coronado, Cal.

408,440.—AUTOMATIC BELL-RINGER—W. W. Slater, Oakland, Cal.

408,360.—WATER-PROOF LEATHER—A. Sommer, Berkeley, Cal.

408,443.—CABLE R. R. TURNTABLE—J. C. H. Stut, S. F.

408,445.—VEIL FASTENER—P. N. Tryon, S. F.

408 279.—ZINC ELECTRODE—J. B. Williams, Oakland, Cal.

The following brief list by telegraph, for Aug. 14, will appear more complete on receipt of mail advices:

California—John M. Adams, San Francisco, two patents for ore-concentrator belt; Hans C. Behr, assignor of half to B. T. Lacy of San Francisco, adjustable gear for crushing rolls; Ernest H. Chesterton, Los Angeles, finger guard; Byron Jennings, San Jose, conduit for electric railway; Alva L. Reynolds, Elsinore, solar water-lifting apparatus; Oscar W. Schmidt, assignor of half to J. S. Cohen, San Francisco, driving or stop mechanism; Chester William M Smith, San Francisco, railway car.

Oregon Jacob C Welcome, Burns, reversible safety stirrup; Giles W. Weller, Baker City, ore-crusher; Samuel Rothchild Pendleton, harrow.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

GAS ENGINE.—Daniel S. Regan, S. F. No. 408,356. Dated Aug. 6, 1889. The improvements consist in making the piston a part of the electric circuit and fitting one of the electrodes to it, while the other electrode, properly insulated, is so arranged within the cylinder as to be touched by the piston electrode at each stroke so that the circuit is closed and broken at each stroke of the piston. The object of the invention is to provide an explosive gas engine with an igniter, the operation of which shall be dependent upon the movements of the engine piston, and to close and open the electric circuit by the stroke of the piston.

CABLE RAILWAY TURNTABLE.—John Ch. H. Stut, S. F. No. 408,443. Dated Aug. 6, 1889. This turntable is so constructed that it may be introduced into the track at any point in the line and may be turned around so as to reverse the car by the direct action of the traveling cable, and without the necessity of depressing the cable in any way in order to clear the table or in any way interfering with the action thereof, or using any supplemental connections to turn the table.

HOSE COUPLING.—James Pringle, Silver King, Arizona, assignor of one-half to Rob't Bowen of same place. No. 408,434. Dated Aug. 6, 1889. The claim in this patent is: "In a hose coupling, the opposing coupling heads, one of which is provided with the grooves or bolt-seats in combination with the bolts, pivoted in the opposing head, the cam-faced disks in the ends of the bolts, the levers having the cam-faced heads bearing against the disks, the sleeves of said heads and the springs acting against the sleeves to hold the lever-heads in place."

AUTOMATIC BELL-RINGER.—Wm. W. Slater, Oakland. No. 408,440. Dated Aug. 6, 1889. This is a device for automatically ringing a bell. It is specially adapted for ringing cautionary or alarm bells such as are employed at railroad crossings and for other similar purposes. It consists in a bell fixed in a suitable supporting frame, and having a swinging tongue or clapper with a mechanism for actuating the same which is operated by the pressure of air upon a piston within a cylinder, and in connection therewith of an electro-magnet device, whereby the valve is opened to admit air to the operating cylinder, the circuit being alternately made and broken by the movement of the piston.

WATER ELEVATOR.—August H. Elfers, Phœnix, Arizona. No. 408,406. Dated Aug. 6, 1889. This relates to that class of water elevators in which buckets are attached to and carried by endless chains, whereby said buckets are successively carried down into the water so as to fill them and raised therefrom and adapted to discharge their water at the top. The object is to provide a practical and effective elevator for raising water from wells and streams or other source of supply for irrigating land, and for all other purposes for which large quantities of water are required.

HEADER AND THRASHER.—Benjamin Holt, Stockton. No. 408,412. Dated Aug. 6, 1889. The improvements in combined headers and thrasher covered by this patent are especially applicable to the header portion of the apparatus, and consist in certain constructions and combinations of devices whereby the power may be transmitted from the thrashing machine portion of the apparatus to the header portion of the apparatus, and certain changes of direction made in transmitting this power so as to accommodate the intermediate machinery to the relative positions of the header and thrasher, the front of the header not standing at right angles with the thrashing machine.

TRAVELING THRASHER.—Benjamin Holt and Jabez Draper, Stockton. No. 408,413. Dated Aug. 6, 1889. This patent covers certain construction and combination of mechanism, and the especial features of the invention are in the use of a system of chain driving which supersedes the use of gears and belts, whereby the machine is made to run lighter than it would with gears, and with no annoyance from slipping, such as will occur when belts alone are used. It also covers the relative arrangement of the chain-driving system, so that the portion which includes the thrashing and feeding mechanism and parts intimately connected with these are driven from one portion of the system, while those parts which belong properly to the separating and cleaning mechanism are driven from another portion of the system.

PACKING FOR STUFFING-BOXES.—Chas. H. Ensign, Temescal, and Phin B. Wright, Berkeley. No. 408,407. Dated Aug. 6, 1889. The invention relates to the class of stuffing-boxes of piston-rods, valve-rods, pump-rods or any reciprocating part about which a tight joint is required to be formed; and the invention consists in certain combinations and constructions. There is little wear on the packing, and it can always be kept well set up. It can be easily applied and as easily removed, and is very durable.

STEAM MOTOR FOR PUMPS.—Henry O. Beatty, Sacramento. No. 408,400. Dated Aug. 6, 1889. The object of this invention is to provide a steam motor or engine specially adapted for the operation of pumps in which the whole expansive power of the steam is employed to move water (or any other heavy substance it may be desirable to raise for a limited distance) in a vertical line without the use of any crank or circular motion, the power being used only in the ascending line, the return movement being wholly by gravity.

COUNTER-SHAFT AND BELT-TIGHTENER.—Peter H. Kroncke, Santa Rosa. No. 408,417. Dated Aug. 6, 1889. The invention relates to a counter-shaft and driving pulleys and a movable or tilting frame upon which said shaft is journaled, with a means whereby the frame and shaft may be moved so as to tighten or slacken a belt from a continuously running driving shaft, whereby power may be transmitted through the counter-shaft and said shaft started and stopped at pleasure. Various arrangements of this mechanism may be made.

HOSE COUPLING.—Abbie P. Hanscom, S. F., executrix of W. W. Hanscom, deceased, assignor to H. D. Bacon. No. 408,409. Dated Aug. 6, 1889. This invention relates to an improved construction of hose couplings and is especially applicable in making the couplings of pipes which are to convey air or other elastic medium, as in the cases of pipes for air-brakes. It consists of flexible coupling pipes with collars fitted upon the meeting ends of the pipes to be coupled, and having thin flexible flanges projecting a short distance from the periphery toward the center of these ends, so that when the ends are brought together and retained in this position the pressure from within the pipe will force these flanges together and prevent leakage. The exteriors of the pipes are encircled by metal collars having lugs upon opposite sides and hook levers fulcrumed between these lugs, so that the hooks of the levers fulcrumed upon the collar of one pipe will engage with the flange of the opposite pipe and hold them together. The opposite ends of the levers are bent so as to rest upon the elastic surface of the flexible pipe, and the pressure within the pipe acts upon these levers so as to retain the hooks in engagement with the opposite flanges.

Mining Personals.

Joseph G. Hoar is pumpman at the Parrott mine, Montana.

W. E. Sharon, superintendent of the Yellow Jacket, is in the city.

H. W. Sparks is superintendent of the Red Lion, Georgetown, M. T.

Thos. Brown has charge of the Bonanza mine, Harqua Hala, Arizona.

George L. Brown, a mining man of West Point, Calaveras county, is in the city.

Ben Thayer of Butte is successor to Walter Banks as foreman at the Bi-Metallic mine.

W. C. Price has been re-elected superintendent of the Navajo mine, Tuscarora, Nev.

Clarence King, the well-known geologist, is in business at El Paso, but is now visiting New York.

W. A. Cowles of Battle Creek, Michigan, is now extensively interested in mines at Sparta, Oregon.

Charles Derby has been appointed superintendent of the Lady Washington mine, on the Comstock, vice E. D. Boyle.

E. C. Scoville and J. F. Hawes, two Idaho mining men, are on the way to South Africa to examine the gold-fields there.

L. N. Smith is in charge of the mine workings of the Wasatch group in Blue Ledge district, Utah, east of the Ontario.

Dwight Crittenden, formerly superintendent of the Bodie mine, is in Norway examining some mining properties for English capitalists.

S. W. Harney has just sold his interest in the Baltimore group of mines, near the Woodside and Mayflower, at Park City, to Denver parties.

G. M. Sprague of Central City, Colorado, and J. Leonard of Denver are in Park City, Utah, examining mining properties with a view of investing.

H. W. Sparks is superintendent of the Diamond Mining Co., owning a group of claims across the gulch from the Red Lion, Georgetown, Montana.

Mr. A. Breece of Bath, Placer county, is in this city. His mine is paying splendidly, averaging $30 a car for several days prior to Mr. Breece's departure.

Mr. Moore, who has been superintendent of the Buchanan mine, Tuolumne county, has resigned on account of ill health. He has been succeeded by James Hamilton.

C. W. Goodale, superintendent of the Gagnon and other mining properties of the Colorado Company, has returned to Butte, M. T., after a six weeks' vacation spent in the East.

Wm. J. Jameson, the youngest of the engineers at Butte, has given up his position as engineer of the Parrott, and gone back to Pennsylvania. Joseph Corby has been appointed to the vacancy.

Thos. Benny and W. B. Hocking have purchased a controlling interest in the Bluejay mine, Washington township, Nevada county, and contemplate making developments on an extensive scale.

Robert Taite, a millwright, who constructed the Mountain View hoisting works and many others in Butte, M. T., has returned from the Cœur d'Alene country, where he has just finished constructing a concentrator for Messrs. Huzzy & Co.

James Stahl, former owner of the Hawkeye mine in Spring gulch, after being out several months prospecting, has struck another bonanza. He relocated the old White Cloud property, about 25 miles from Missoula, M. T., and has been quietly developing it for several weeks.

L. B. Hopkins was down at Keeler, Inyo county, the other day looking after some mining interests. He was a superintendent on the Comstock in early days, and one of the pioneers of Aurora and Bodie. He was also at the Julian mines, San Diego county, for a year after the mines were first discovered.

Hoop-Clamp for Large Tanks.

(*Continued from page 121.*)

Practically considered, this device has proved a great success. By its use, Wells, Russell & Co. of the Mechanics' Mills have set up some tanks as large as 36 feet in diameter, and these have been made perfectly water-tight without any difficulty.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, term of subscription, and give it their own patronage, and as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

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OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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DR. W. F. DRAKE—Sonora, Cal.
A. F. JEWETT—Tulare Co.
ROBERT M. MAPPES—Fresno Co.
E. L. RICHARDS—San Diego Co.
WM. WILKINSON—San Joaquin Co.
JULES BAUMANN—Arizona.
FRANK S. CHAPIN—Nevada.
CHAS. F. BLACKBURN—Idaho.
L. H. WILSON—Oregon.

Assessment Notices.

ASSESSMENT NOTICE.

California & Nevada Railroad Company.—Location of principal place of business, San Francisco, California. Location of Railroad, Alameda County, California.

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 3d day of August, 1889, an assessment, No. 1, of Fifty Cents per share was levied upon the Capital Stock of the corporation, payable immediately in United States Gold Coin to the Secretary at the office of the Company, Room 12, No. 320 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 20th day of September, 1889, will be delinquent and advertised of sale at public auction, and unless payment is made before, will be sold on Monday, October 14th, 1889, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

E. A. PHELPS, Secretary.

Office, Room 12, No. 320 California Street, San Francisco, California.

ASSESSMENT NOTICE.

Gray Eagle Mining Company.—Location of Principal place of Business, San Francisco, California. Location of Works, Placer County, California.

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 13th day of August, 1889, an assessment, No. 14, of Four Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin, to the Secretary, at the office of the Company, 327 Pine Street, Room 9, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 16th day of September, 1889, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 8th day of October, 1889, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

O. H. BOGART, Secretary.

Office, 327 Pine Street, Room 9, San Francisco, Cal.

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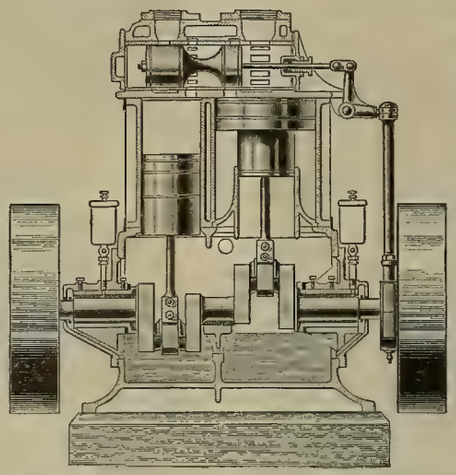
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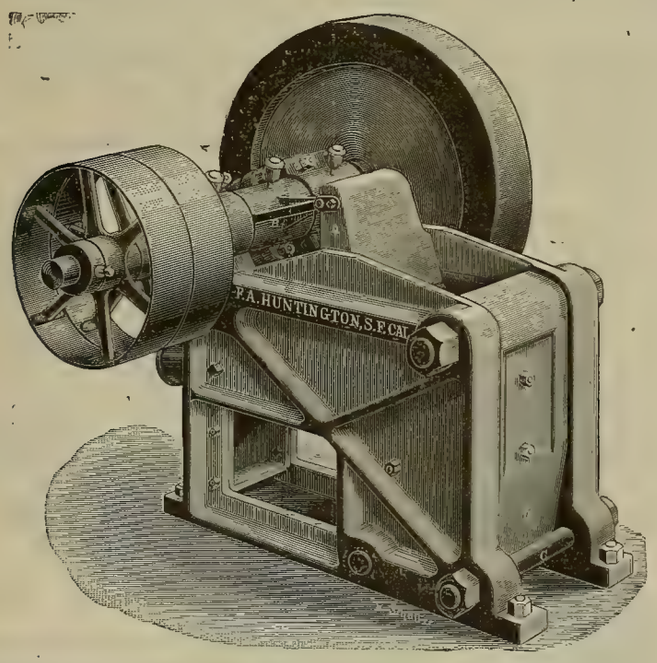
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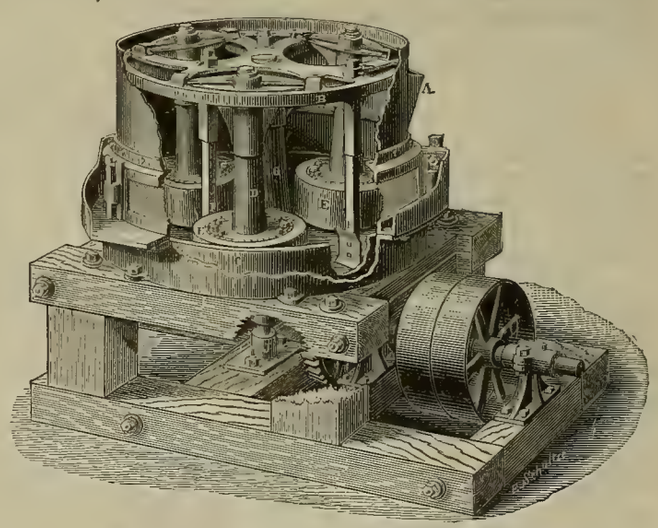
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Huntington's Improved Rock-Breaker.

The main features of this machine are strength, ease of adjustment and simplicity of construction.

The movable jaw *A* is worked by the eccentric *B* and is pivoted at the bottom. The stationary jaw *D* is secured at the top by a bolt running through it, and at the bottom bears against the heavy bolt *C*. The main wear is, of course, at the bottom of a breaker of this form, and the wear is easily taken up by inserting a plate between the bolt *C* and the jaw *D*. The jaw is thus swung in at the bottom, and the opening where the ore passes through is made correspondingly smaller. As will be seen by the cut, this machine is of very simple construction and is strong and durable.



F. A. HUNTINGTON'S Centrifugal Roller Quartz Mill.

The following will explain the above cut:

The ore and water being fed into the mill at the hopper *A*, the rotating rollers and scrapers throw the ore against the ring die, where it is crushed to any desired fineness by the centrifugal force of the rollers as they roll over it.

The water and pulverized ore are thrown against and through the screens when fine enough. The discharge is so perfect that it makes little or no slimes, and leaves the pulp in good condition for concentration. The rollers are suspended, leaving a space of one inch between them and the bottom of the mill, thus allowing them to pass freely over the quicksilver and amalgam without grinding it or throwing it from the mill, while it agitates it sufficiently to make amalgamation perfect. For wet crushing and gold saving it has no equal.

I claim especial merit in that feature of this system *which prevents* ALL FLOURING of gold and quicksilver, and the consequent loss of gold that attends stamp milling.

For the economical working of ore that contains sulphurets, I particularly claim the adaption of this mill. The rotary method of crushing the ore so granulates the pulp (which is discharged the moment it is crushed) that a complete concentration of sulphurets is rendered most easy.

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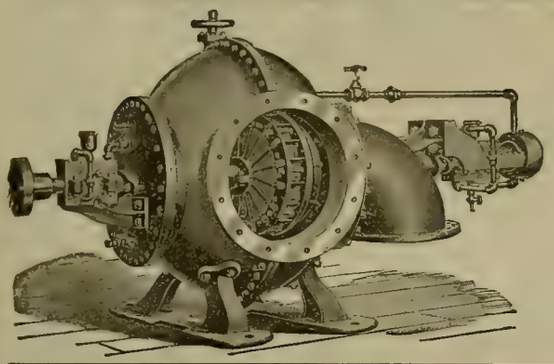
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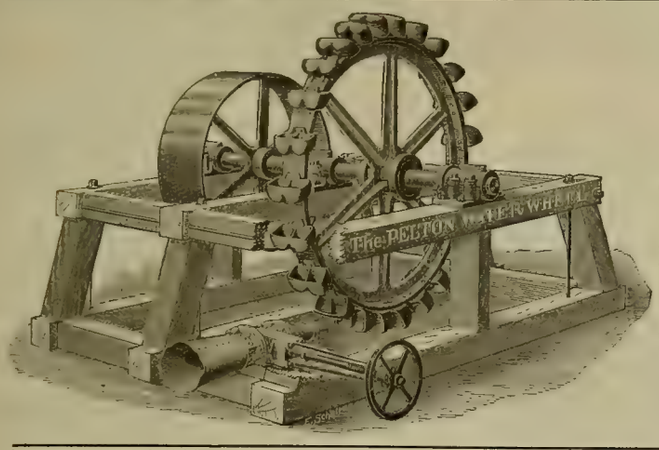
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Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

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JOHN W. QUICK, Proprietor.

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Aug. 15, 1889.

General trade shows a steady increase in all branches, with the buying, as a rule, still of an assortment character. It is claimed that taken as a whole interior merchants are lightly stocked, and when fall buying sets in business will be more active than for several years past. It is also claimed that this fall interior merchants will be in good shape financially, owing to the good crops, fair prices, and farmers not having speculated much, if any. The land boom of two years ago caused many to speculate beyond their means, which has "run them close to windward." Manufacturers and ironworkers report a steady improvement in their special branches of trade.

The local money market is reported easy. The call for accommodation on wheat stored in warehouses is, as yet, light from city banks It is reported by operators that warehousing in the interior is quite general and that farmers are getting loans, so far, from local sources. It is generally conceded that when harvesting is well over and heavy deliveries of grain set in, quite an active demand will rule for accommodations on warehouse receipts. It now looks as if the wheat crop will go all of 1,800,000 tons, but the barley crop will not be as large as that of last year. Canned fruits and dried fruits are beginning to move and at fairly remunerative prices.

Exchanges on New York are offering more freely, and as the inquiry is only fair the rates are against sellers.

The treasure shipments hence in last month compare as follows with the like month in 1888:

	1888.	1889.
Silver bars	$959,600	$470,160
Mexican dollars	280,641	777,872
Peruvian dollars	4,627	.....
Silver coin	.....	5,000
Gold coin	838,705	229,431
Gold dust	470	410
Currency	204,000	18,892
Totals	$2,288,043	$1,521,766

The amounts and descriptions of specie shipped from San Francisco in the first seven months of the year compare as follows:

	1888.	1889.
Silver bars	$5,834,250	$5,207,560
Gold bars	1,400	.....
Mexican dollars	1,861,415	5,261,801
South American dollars	10,235	41,131
Gold coin	3,994,333	3,827,104
Silver coin	30,344	92,000
Gold dust	2,796	2,545
Currency	809,230	707,993
Totals	$12,544,008	$15,140,134

The steamer City of Peking, hence Aug. 13th for China, took out the following treasure: To Hong Kong, Mexican dollars, $203,190; gold coin, $4041; gold-dust, $70; silver bullion, $39,300. To Shanghai, silver bullion, $66,000; to Japan, silver bullion, $44,000; Mexican dollars, $149,000; to Higo, silver bullion, $89,000.

MEXICAN DOLLARS—There was fair inquiry for shipment by the last outward steamer for China. The price remained steady at last week's quotations, closing at 73¾ for old and 74¼ for new.

SILVER—The market is quiet but firm. As high as 93 cents is reported to have been paid for bullion for shipment by the last steamer that sailed for China. The market opened the week under review at 92½ to 92¾, and gradually strengthened until 93 cents was reached. At the close 92½ cts. is given as the quotations, with very little, if any, inquiry. Receipts are reported to be light.

QUICKSILVER—Receipts the past week were very light, aggregating only 60 flasks. The demand is reported to be only fair, but with light receipts and high markets abroad, ours rules very strong.

ANTIMONY—The market is strong and quotable higher in sympathy with the East, where a scarcity is reported.

BORAX—Receipts the past week aggregate 1486 centals, and the exports as follows: Victoria, B. C., 222 pounds; Boston, 20,937; New York, 20,270. The market is reported firm at unchanged quotations.

LIME—Receipts the past week aggregate 4001 barrels, while the shipments by sea were only 40 barrels to Honolulu. The home demand is good, with quotations unchanged.

LEAD—The market is without change. At the East the market is irregularly dull.

COPPER—The market has shown a fair degree of strength in sympathy with a steady and fairly firm market at the East and abroad. The consumption, the world over, is reported to be increasing, while the output, except in America, is decreasing.

TIN—The imports the past week were 206 boxes plate, overland. Notwithstanding the higher markets abroad and better outward freights, our market does not show any advance for spot, although for shipment a slight advance is obtainable. At the advance our advices indicate that the output abroad will be increased.

The shipments by sea from this port the past week aggregate as follows: Santa Rosalia, 206,800 pounds; Victoria, B. C., 281,922 pounds plate and 8535 pounds pig.

IRON—Imports the past week aggregate 200 tons from Newcastle, England. The market both for spot and to arrive is heavy. Holders to sell have to shade prices, but consumers to buy have to pay full prices. The stock here is still heavy, although it is reported to be gradually decreasing. Foreign and Eastern advices report strong and fairly active markets.

The following are the latest comparative quotations f. o. b. at Glasgow:

F. o. b. Glasgow.	Aug. 1, '89.	Aug. 7, '89.
No 1 Coltness	57s 6d	57s 6d
" Langloan	56s 6d	56s 6d
" Summerlee	57s 6d	57s 6d
" Gartsherrie	55s 6d	55s 6d
At Ardrossa.		
No. 1 Eglinton	46s	46s 6d
" Glengarnock	53s	54s
" Dalmellington	47s 6d	48s

COKE—Imports the past week aggregate 984 tons from Newcastle, England. Quotations are difficult to get correctly. While some claim that 25 to 50 ton parcels on spot can be had at $14.50 to $15, yet large dealers claim that our quotations are correct.

COAL—Imports the past week were as follows: Australia, 8350 tons; Coos Bay, 750; Tacoma, 5100; Seattle, 1890; Cardiff, 1461; Departure Bay, 5550. Total, 22,301 tons. Australian has been advanced with one sale of a cargo to arrive at $7.25 a ton. The advance is due to a scarcity of ships at the supply ports and in consequence higher charters asked. For coast coals there are no changes in prices to report. The spot market is reported strong with a good demand.

Eastern Metal Markets.

By Telegraph.

NEW YORK, Aug. 14, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	42½	92½	$11 85	$3 87½	$19 90
Friday	42½	92½	11 90	3 85	19 95
Saturday	42 5-16	92½	11 90	3 85	19 90
Monday	42 5-16	92¼	11 95	3 85	20 20
Tuesday	42⅝	92⅝	12 00	3 87½	20 40
Wednesday	42 5-16	92½	11 95	3 87½	20 40

NEW YORK, Aug. 13.—Refined Borax scarce. All grades from old prices. Quicksilver firm at 68c @70c. No material variation in the copper situation, with no open quotation for lake, though 12c is still named; other kinds range 10c to 10⅝c for futures. Pig lead weaker, $3.87½@3.90. Business fair.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, August 15, 1889.

ANTIMONY	17 @	—
BORAX—Refined	7½@	7⅝
Powdered	7½@	—
Concentrated	— @	6½
COPPER—		
Bolt	21 @	22
Sheathing	22 @	24
Ingot, jobbing	15 @	16
do, wholesale	13 @	14
Fire Box Sheets	22 @	24
LEAD—Pig	4½@	4⅝
Bar	5 @	—
Sheet	7 @	—
Pipe	6 @	—
Shot, discount 10% on 500 bags Drop, ₱ bag.	1 45 @	—
Buck, ₱ bag	1 65 @	—
Chilled, do	1 85 @	—
STEEL—English, lb	16 @	20
Canton tool	9 @	9½
Black Diamond tool	9 @	9½
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4½@	—
TINPLATE—B. V., steel grade, 14x20, P. S.	4 65 @	4 70
B. V., steel grade, 14x20, spot	4 80 @	4 90
Charcoal, 14x20	6 25 @	6 75
do roofing, 14x20	5 12½@	5 25
Pig tin, spot, ₱ lb	21 @	21½
do, do, prompt shipment	— @	—
QUICKSILVER—By the flask	47 50 @	50 00
Flasks, new	@	—
Flasks, old	37½@	—

IRON—Glengarnock ton	Spot. 27 00 @	To Load. —
Eglinton, ton	26 00 @	—
American Soft, No, 1, ton	— @	31 00
Oregon Pig, ton	— @	30 00
Clay Lane White	@	24 50
Shotts, No. 1	28 50 @	29 00
Bar Iron (base price) ₱ lb	2½@	3
Chrome iron ore, ₱ ton	— @	10 00

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$19 00	$16 00
41 to 50 ft	20 00	17 00
51 to 60 ft	22 00	19 00
61 to 70 ft	26 00	22 00
1x3, fencing	21 00	18 00
1x4, "	20 00	17 00
1x3, 1x4 and 1x6, odd lengths	18 00	16 00
Second quality	16 00	14 00
Selected	23 00	21 00
Clear, except for flooring	30 00	27 00
Clear for flooring	1 00	.....
Clear V. G. No. 1 flooring	5 00	.....
Firewood	13 00	9 00
Dressed Pine, flooring, No. 1, 1x6	31 00	28 00
No. 1, 1x4	33 00	29 00
No. 1, 1¼x4, 1¼x6, and odd sizes	36 00	32 00
All sizes, No. 2	26 00	23 00
Stepping, No. 1	43 00	34 00
Stepping, No. 2	33 00	24 00
Ship timber and plank, rough	26 00	17 00
Selected, planed 1 side, av'ge 40 ft	28 00	23 00
" " 2 " " "	30 00	25 00
" " 3 " " "	32 00	27 00
" " 4 " " "	34 00	29 00
Deck plank, rough, average 35 ft	34 00	31 00
Dressed, average 35 feet	39 00	34 50
Pickets, rough, B. M	19 00	15 00
½x1½, 4 ft long, ₱ M	5 50	4 00

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	$7 00 @ 7½	Cardiff	9 50@10 00
Liverpool St'm	7 50 @ 7 75	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	8 00 @ 8 50	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Gilman	6 00
Scotch Splint	9 00	Seattle	6 00
West Hartley	11 00	Coos Bay	5 00
Greta	8 00	Cannel	10 00
Westminster Brymbo	9 00	Egg, hard	17 50
Nanaimo	9 00	Cumberland, in sacks	19 00
Sydney	8 00	do, bulk	18 00
Jackson	6 00		
COKE—Eng., ton, spot, in blk & sks, respt'vly			17 00 @20 00
Do, do, to load			13 00 @13 25

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Blue Bird, Aug. 5, $18,336; Lexington, 5, $24,720; Alice, 6, $29,856; Hanauer, 8, $2220; Commonwealth, 10, $21,000; Hanauer, 10, $3100; Cons. California and Virginia, 10, $93,929; Commonwealth, 13, $42,505; Blue Bird, 10, $1876; Lexington, 10, $10,592. Last week's mineral exports from Salt Lake City were 14 cars bullion, 379,699 lbs.; 2 cars lead, 55,215 lbs.; 63 cars silver and lead ores, 2,132,174 lbs.; 7 cars copper ore, 232,500 lbs.; total, 86 cars, 2,799,588 lbs.

THE scarcity of water in portions of Montana is causing mills to shut down.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Argenta M Co	Nevada	13	10	July 20	Aug 21	Sept 16	E M Hall	314 Montgomery St
Alpha Con M Co	Nevada	3	25	July 15	Aug 22	Sept 15	C E Elliott	309 Montgomery St
Baltimore M Co	Nevada	5	25	July 2	Aug 5	Aug 24	A R Grim	401 Montgomery St
Baker Divide M Co	California	17	25	July 8	Aug 10	Aug 28	D M Kent	330 Pine St
Bulwer Con M Co	California	6	25	Aug 6	Sept 12	Oct 10	L Osborn	309 Montgomery St
Cadmus M Co	Nevada		20	June 3	July 18	Aug 19	J Craig	204 California St
Calaveras Blue Gravel M Co	Cal	3	3	Aug 3	Sept 16	Oct 2	B Burris	240 Montgomery St
Challenge Con M Co	Nevada	5	50	Aug 6	Sept 9	Sept 30	C L McCoy	329 Pine St
Chollar M Co	Nevada	27	50	July 15	Aug 20	Sept 10	C E Elliott	309 Montgomery St
Crown Point M Co	Nevada	51	50	July 9	Aug 12	Sept 2	J Newlands	329 Pine St
East Mt Diablo M Co	California	5	10	July 18	Aug 22	Sept 16	R W Heath	318 Pine St
East Sierra Nevada M Co	Nevada	1	10	Aug 3	Sept 13	Oct 7	G R Spinney	310 Pine St
Gray Eagle M Co	California	14	4	Aug 13	Sept 16	Oct 3	O H Bogart	317 Pine St
Golden Fleece G'v'l M Co	California	14,17	00	May 21	July 20	Sept 16	W J Gleason	806 Market St
Grand Prize M Co	Nevada	21	30	July 27	Aug 30	Sept 20	R R Grayson	327 Pine St
Kentuck M Co	Nevada	19	30	July 30	Sept 2	Sept 20	J W Pew	310 Pine St
Mexican M Co	Nevada	38	25	July 9	Aug 13	Sept 3	C E Elliott	309 Montgomery St
Mono M Co	California	28	50	July 24	Aug 23	Oct 1	B L Burling	309 Montgomery St
North Belle Isle M Co	Nevada	15	30	June 17	Aug 1	Aug 22	J W Pew	310 Pine St
Overman S M Co	Nevada	60	25	July 27	Aug 30	Sept 20	G D Edwards	414 California St
Palesade S M Co	Nevada	1	10	Aug 6	Sept 16	Oct 2	D Buck	309 Montgomery St
Savage M Co	Nevada	73	50	July 19	Aug 21	Sept 10	E B Holmes	309 Montgomery St
Scorpion M Co	Nevada	1	10	Aug 8	Sept 13	Oct 7	G R Spinney	310 Pine St
Utah Con M Co	Nevada	7	25	July 9	Aug 13	Aug 30	A H Fish	309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING	DATE
Con Pacific M Co		F E Luty	330 Pine St	Annual	Aug 17
Gover M Co		Gray Drew	13 & 15 Fremont St	Special	Sept 9
Independence M Co	Nevada	J W Pew	310 Pine St	Annual	Aug 19
Live Oak Drift Gravel M Co	California	J Morizio	328 Montgomery St	Annual	Aug 20
Union Con M Co	California	L H Barnard	402 Front St	Special	Aug 21

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Caledonia M C	Nevada	A S Cheminant	328 Montgomery St	08	Aug 5
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	July 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	July 25
Idaho M Co	California		Grass Valley	7 50	May 5
Navajo M Co	California	J W Pew	310 Pine St	10	Apr 1
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Aug 10

Mining Share Market.

The past week witnessed more general activity in mining stocks than for some time past, and as the general tendency of prices for the Comstock was upward, there was not only a more cheerful feeling, but a more general gathering of outside dealers ready to be fleeced. When the market was dragging at low prices, everything was pictured the darkest, and no one, only those who have seen dark days before, cared to buy; but now with big bull points afloat, and rumors of ore strikes being circulated, there appears to be more of a scramble to "get in" before prices jump out of their reach. While the writer is neither a prophet nor the son of a prophet, or professes to see further than any other outsider into the mysterious ways that insiders have of manipulating the market, yet he would advise caution in buying, for the conditions, unless there are a large number of moneyed short-sellers on the market, are against much of a bull movement at the present time. Money will soon begin to go out to aid in moving the wheat crops, while merchants will not, for about two months yet, begin to receive free remittances from the interior, and last, but not least, there are too many persons who operate at times in stocks at work on the farms and railroads, besides which the work in the mines does not indicate anything of importance being developed for some time to come. In outside stocks, trading the past week was light. The Quijotoas made a slight move up; the Bodies barely held their own, while the Tuscaroras set back, with Commonwealth making quite a break, owing to the managers shutting down the mill, and, so reported, doing other things to depress the stock. When the price was over $5 a share, nothing was too good to be said of the prospects, but now with the stock down, nothing is too bad to be said. It looks as if the manipulators are getting ready for a deal in the stocks by inviting short-selling.

The market opened this (Thursday) morning, barely steady at last night's lower prices. The general tone points to a small up, before going much, if any, lower.

The news from the Comstock mines indicates that preparatory work of more importance is to be inaugurated soon along the entire lines, but more particularly in the Middle and Gold Hill groups. The work of extending the 500-foot and 1300-foot north lateral drift from the Yellow Jacket shaft is being vigorously pushed, and soon they will be in position to start a series of crosscuts from these two levels in all the mines extending from Yellow Jacket to Bullion. The Ward shaft is being repaired preparatory to extensive explorative work on the various levels down to the 1500-foot level. Good results are expected to follow the work from this shaft. In Alpha, on the 500-foot west crosscut, a very promising 9-foot ledge was cut. While the ore assays low, yet the indications are of the most flattering character for something still better when they prospect the find. A silence of death is the order regarding the work going on in the Yellow Jacket, and for that reason old and experienced miners are expecting something from that direction before 60 or 90 days roll by. It is claimed that very important work is going on toward the west in the Crown Point and Belcher. Very little of interest can be had from the North End mines, where very important work is or ought to be under way. From the Quijotoas, Bodies and Tuscaroras the same old stale reports come in an official way, but nothing so far from trustworthy private sources.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, department 10, San Francisco:

VULCAN PILE ARMOR CO., Aug. 10. Object, to treat piles and protect them from the ravages of the teredo worm and to do a general lumber business. Directors—John H. Wise, John T. Davis, Wm. E. Brown, M. Connell and John H. Miller. Capital stock, $150,000.

BRUNSWICK BILLIARD-TABLE CO., Aug. 10. Capital stock, $200,000. Directors—E. Brunswick, Geo. W. Shell, J. J. Scrivner, Joseph Figel and Sol J. Levy.

GOLDEN GATE LUMBER CO., Aug. 13. Capital stock, $100,000. Directors—O. H. Greenwald, D. H. Bibb, A. Heilbrunner, L. H. Greenhood and J. Newbauer.

BURNHAM-STANDEFORD CO., Aug. 15. Capital stock, $120,000. Directors—O. H. Burnham, D. W. Standeford, A. T. Buswell, E. R. Hundley, J. C. Martin. This company succeeds to the planing-mill business of Burnham, Standeford and L. G. Cole, in Oakland.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 24.		WEEK ENDING July 31.		WEEK ENDING Aug. 7.		WEEK ENDING Aug. 14.	
Alpha	1.00	1.15	.95	1.10	1.75	1.00	.75	1.15
Alta	1.30	1.45	1.25	1.30	1.30	1.30	1.30	1.40
Andes	.60	.65	.60	.65	.50	.60	.55	.70
Argenta	.....	.....	.....	.....	.....	.....	.....	.....
Belcher	2.80	2.95	2.35	2.85	2.15	2.55	2.20	3.05
Best & Belcher	3.45	3.80	3.10	3.60	2.70	3.15	3.00	4.00
Bullion	.65	.....	.60	.65	.40	.60	.50	.75
Baltimore	.....	.....	.05	.....	.....	.....	.....	.....
Belle Isle	.25	.....	.25	.....	.15	.20	.....	.....
Bodie Con	1.20	1.40	1.05	1.15	.70	1.00	.80	.90
Benton	4.00	.....	4.50	.....	.....	.....	.....	.....
Bodie Tunnel	.....	.....	.....	.....	.....	.....	.....	.....
Bulwer	.30	.....	.30	.....	.15	.20	.10	.15
Commonwealth	3.95	4.30	3.95	4.10	3.05	4.00	2.45	3.20
Con. Va. & Cal	.7	71	63	71	63	71	7⅛	7⅛
Challenge	1.90	2.10	1.75	2.05	1.50	1.85	1.45	2.20
Chollar	1.45	1.50	1.35	1.50	.10	1.35	1.30	1.50
Confidence	5½	6	5.50	.....	5½	5½	6½	6
Con. Imperial	.40	.50	.40	.50	.35	.45	.35	.55
Caledonia	.20	.25	.20	.....	.15	.....	.15	.20
Con. Pacific	.....	.....	.....	.....	.....	.....	.....	.....
Crown Point	2 10	2.15	2.00	2.20	1.70	2.10	1.75	2.55
Crocker	.35	.40	.35	.....	.30	.35	.35	.40
Central	.....	.....	.....	.....	.....	.....	.....	.....
Dudley	.....	.....	.....	.....	.....	.....	.....	.....
East B. & B	.....	.....	.....	.....	.....	.....	.....	.....
Eureka Con	.....	.....	1.35	.....	.....	1.50	.....	.....
Exchequer	.60	.70	.60	.65	.50	.60	.50	.70
Grand Prize	.75	.80	.50	.....	.35	.45	.40	.....
Gould & Curry	2.00	2.10	1.80	2.10	1.60	1.90	1.70	2.25
Hale & Norcross	2.90	3.00	2.75	3.00	.....	.....	2.70	3.10
Holmes	.....	.....	.....	.....	.....	.....	.....	.....
Independence	.....	.....	.....	.....	.....	.....	.....	.....
Iowa	.....	.....	.....	.....	.....	.....	.....	.....
Julia	.30	.35	.30	.....	.20	.30	.20	.25
Justice	1.70	2.15	1.55	1.80	1.30	1.55	1.40	1.60
Kentuck	1.05	1.15	.....	.....	.....	.....	.70	1.00
Lady Wash	.40	.....	.40	.....	.....	.....	.....	.....
Locomotive	.....	.....	.....	.....	.....	.....	.....	.....
Martin White	.....	.....	.....	.....	.....	.....	.....	.....
Mono	.90	1.00	.60	.70	.50	.....	.50	.55
Mexican	2.85	3.00	2.50	2.95	2.15	2 60	2.30	2.45
Mt. Diablo	.....	.....	.....	.....	.....	.....	.....	.....
Navajo	.....	.....	.....	.....	.40	.....	.....	.....
North Belle Isle	.95	1.15	.95	1.30	1.00	1.25	.90	1.10
Niagara	.....	.....	.....	.....	.....	.....	.....	.....
Nev. Queen	1.35	1.50	1.25	1.30	1.00	1.30	.85	1.00
North G. & C	.....	.....	.....	.....	.....	.....	.....	.....
Occidental	1.90	2.3	2.00	2.20	1.85	2.10	1.90	1.95
Ophir	4.55	4.85	4.25	4.65	3.75	4.20	4.10	5.25
Overman	.85	1.00	.75	.80	.65	.75	.60	.90
Potosi	1.45	1.60	1.40	1.55	1.20	1.40	1.25	1.65
Peerless	.35	.40	.30	.35	.25	.30	.25	.40
Pecr	.....	.....	.....	.....	.10	.15	.10	.20
P. Sheridan	.....	.....	.....	.....	.....	.....	.....	.....
Silver Star	.....	.....	.....	.....	.....	.....	.....	.....
Savage	1.65	1.80	1.35	1.65	1.15	1.40	1.25	1.75
S. B. & M	1.85	2 00	1.60	1.85	1.40	1 65	1 40	1 75
Sierra Nevada	2.25	2.35	2.00	2.30	1.95	2.15	2.00	2.70
Silver Hill	.50	.65	.40	.55	.35	.40	.40	.45
Silver King	.....	.....	.85	.....	.....	.....	.....	.....
Scorpion	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis	.....	.....	.....	.....	.....	.....	.....	.....
Syndicate	.....	.....	.....	.....	.....	.....	.....	.....
Union Con	2.85	3.00	2.60	2.95	2.20	2.60	2.45	3.15
Utah	.75	.....	.65	.75	.55	.70	.50	1 10
Yellow Jacket	2.80	3.00	2.60	2.90	2.30	2.65	2.35	3.30
.....	.....	.....	.....	.....	.....	.....	.....	.....

Sales at San Francisco Stock Exchange.

THURSDAY, Aug. 15, 9:30 A. M.

200	Kentuck		.85c
500	Locom		.10c
460	Alta	1.40	
250	Mexican		3.20
200	Alpha	1.30	
100	Mono		.55c
200	Baltimore	.30c	
300	Nev. Queen		.80c.
220	Belcher	2.75	
50	New York		.40c
100	Caledonia	.20c	
500	Ophir		4.90
100	Commonwealth	3.00	
100	Occident		1.95
350	Chollar	1.90	
450	Overman		.85c
300	Challenge	1.80	
100	Peerless		.35c
500	Crown Point	3.20	
100	Potosi		1.55
700	Con. Imperial	.50c	
150	Savage		1.55
150	Con Va & Cal	7.50	
200	Sierra Nevada		2.50
100	Eureka Con	1.50	
200	Utah		1.05
200	Exchequer	.65c	
100	Union		3.05
220	Gould & Curry	2.10	
300	W Comstock		.45c
350	Justice	1.50	
100	Weldon		.25c
100	Julia	.25c	
100	Yellow Jacket		3.10

DIAMOND DISCOVERIES.—We are told that it is reported that fabulous discoveries of diamonds have been made in the Sierra de la Coronilla, State of Guerrero, Mexico. The information is said to have been derived from Government sources, and more particulars are promised.

A DECISION has been given by a justice of the peace that the copper mines near Valley Springs, Calaveras county, have not poisoned the waters of the Mokelumne river. The Fish Commissioners are to bring another suit at Lodi, San Joaquin Co.

WHEN the winter rains set in there will be more stamps available in the vicinity of the Comstock than before in several years, some new mills having been built and additional stamps having been put into others.

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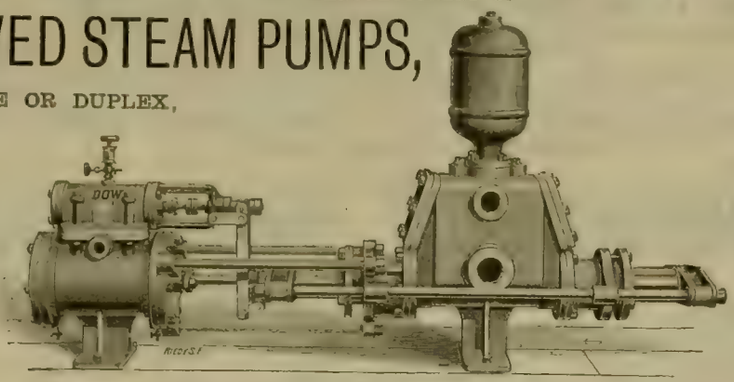
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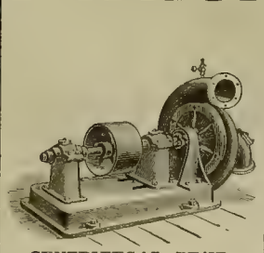
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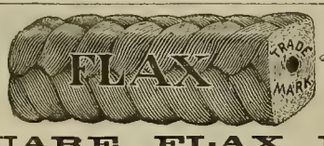
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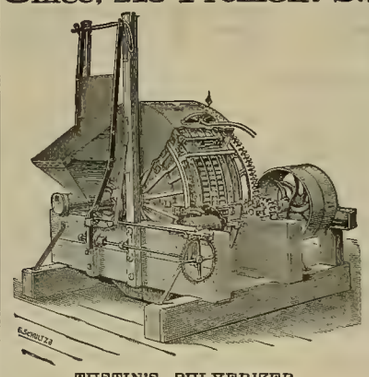
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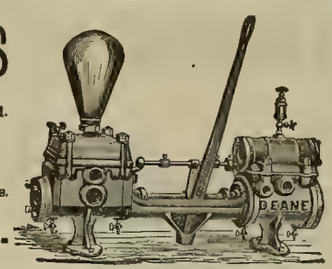
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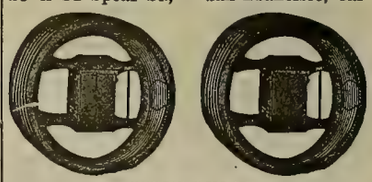

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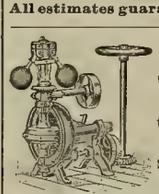

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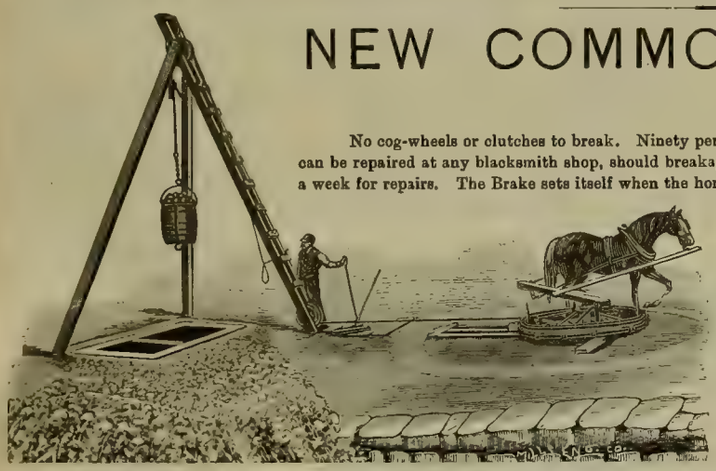
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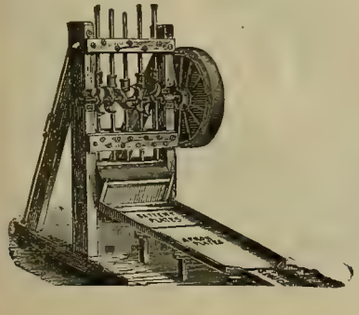
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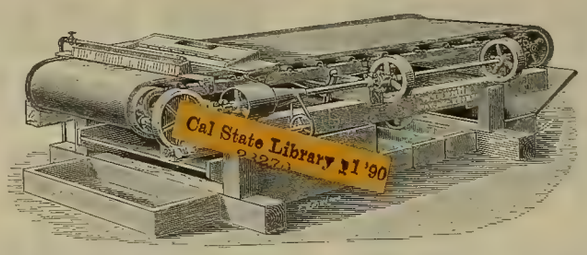
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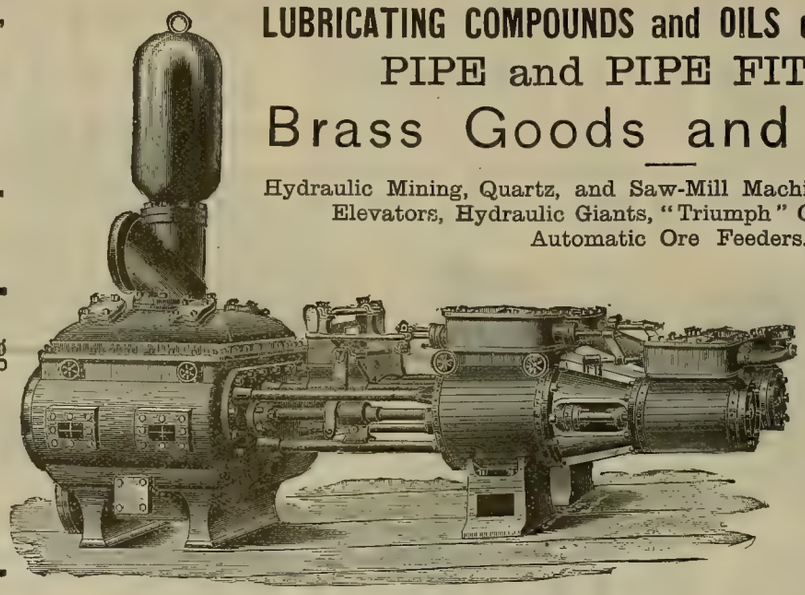
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VOL. LIX—Number 8.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, AUGUST 24, 1889.

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Artesian Wells.

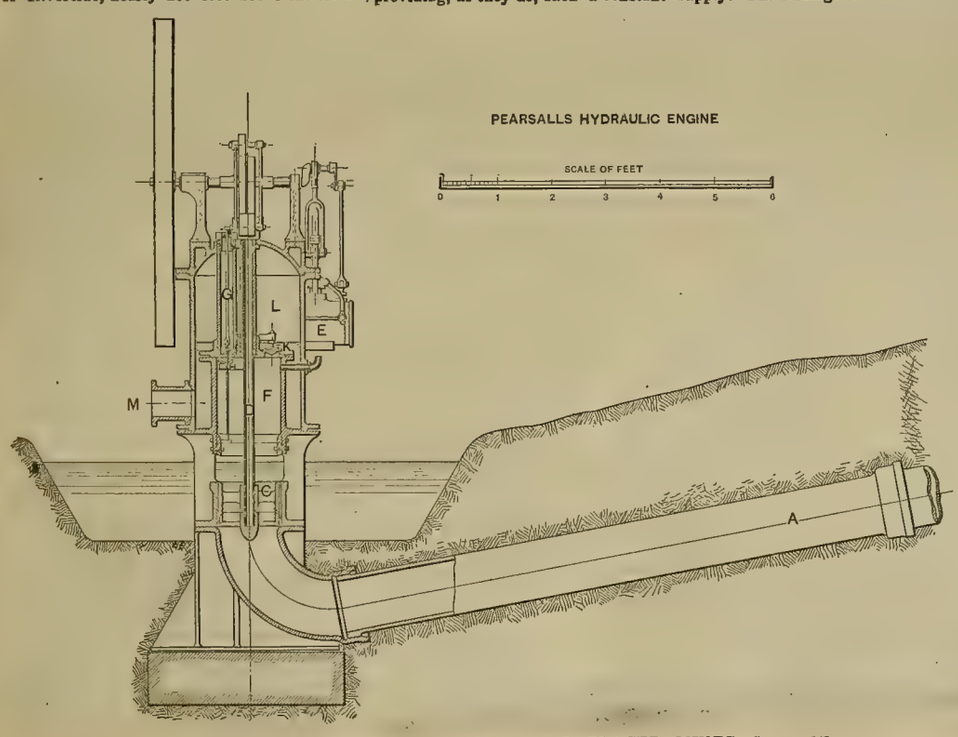
One of the most extensive systems of canals in Southern California is that organized and constructed by Matthew Gage of Riverside. The supply of water from the main canal is taken from artesian wells and the Santa Ana river. Two miles southeast of San Bernardino, and on both sides of the Santa Ana river, is a tract of land owned by Mr. Gage, which is nearly all within the boundaries of the artesian basin of the San Bernardino valley. Upon this he has put down 38 artesian wells to different strata, at depths varying from 150 to 500 feet, and has secured an abundant supply of water for the irrigation of the 12,000 acres under his canal.

The accompanying cut shows a group of six artesian wells at the head of the Gage canal. Several other groups of wells are located near these, and the water from all flows into the Santa Ana river, and at a short distance below, where it unites with the stream, is taken with the water from the river into the canal, by means of a dam. The canal runs southwesterly through the 2400-acre tract above referred to, and for a distance of five miles along its banks other wells can be bored, so that their waters will discharge directly into the canal. The course is still southwesterly along the bluff bordering the river valley, crossing several large arroyos with flumes, and piercing the projecting points of the bluff with some 16 tunnels, until it enters upon the plains of Riverside, nearly 200 feet above the elevation of the canals of the Riverside Water Company. These flowing artesian wells are of the greatest importance to the section in question, providing, as they do, such a constant supply.

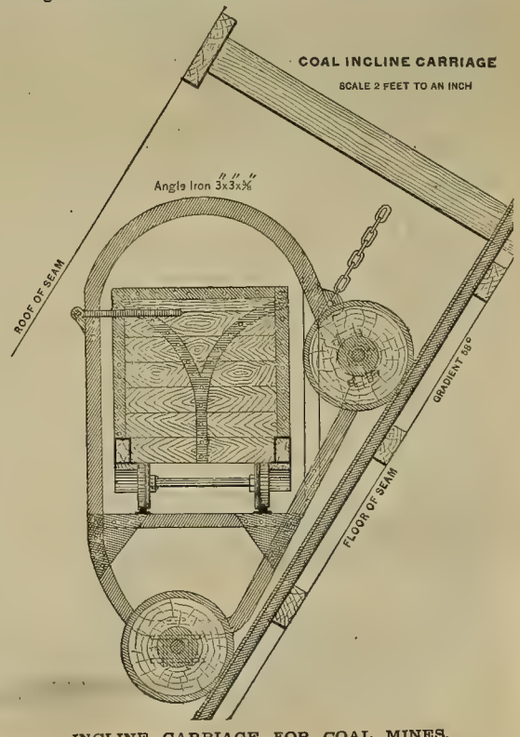


FLOWING ARTESIAN WELLS IN SAN BERNARDINO COUNTY.

A Coal Incline Carriage.—We give herewith a cut of a coal incline carriage such as is used at the Kaiping coal mine, North China. The carriage is run on a self-acting incline and the car is run in upon that and hoisted or lowered. The cut shows the construction plainly, and will prove of interest to coal-mine owners.



THE PEARSALL HYDRAULIC ENGINE FOR PLACER MINES.—See page 148.



INCLINE CARRIAGE FOR COAL MINES.

The Properties of Mercury.

Physical Properties.

[Copyright 1889 by HENRY G. HANKS.]

Mercury, as we know it, is a metal in a state of fusion, and the only one yet discovered which is fluid at ordinary temperatures. It is to this property that it owes its great importance in the arts, and especially its value in amalgamation.

It boils at 680 degrees Fah. and becomes solid at a very low temperature, in which state it has no properties in which it differs materially from other metals, or which would render it specially useful if it could be maintained in that condition. The atomic weight of this most remarkable metal is 100 04 by the old system of notation, which is doubled in the new. The symbol by which it is distinguished in chemical language is "Hg.," from *hydrargyrum*, the Latin name for the metal.

Pure mercury is silver white and very lustrous. At 40 degrees above zero Fah., its specific gravity is 15 012. At 40 below it is 13.545, for which reason it sinks when solid in the fluid portion, as stated elsewhere. At the latter-named temperature the weight of a cubic foot is 846.56 pounds avoirdupois.

The specific gravity of mercury being so great, most other metals float on its surface. A mass of cast iron will swim like a cork in a basin of quicksilver. This was strikingly shown in the California department of the New Orleans Exposition of 1884–5. One hundred and fifty-six pounds of California quicksilver placed in a capacious vessel attracted much attention. In all probability not one person in a thousand who visited the Exposition had ever seen one pound of mercury before, while very few had been granted the privilege of plunging their arms to the elbow in this wonderful liquid metal, an invitation they were not slow to accept.

Many ladies sunk their gloved hands beneath the surface, and, eager to enjoy a new sensation, removed their gloves, and, dipping up the quicksilver, actually shivered with excitement as the cold metallic streams flowed through their fingers to the detriment of their gold rings, which whitened to their great surprise, although they had been warned that such would be the case.

A cannon-ball of iron, from the New Orleans battlefield of 1815, floated on the surface, and was regarded with much curiosity by those who did not understand the reason.

Did it ever occur to the reader what a beautiful object a globule of pure mercury is? Pour some into the palm of your hand and hold it exposed to the bright sunlight. Observe how it reflects the glowing rays like a diamond. Let it fall on some flat, hard surface and see it scatter into flying particles, which flash like little meteors. If you wish to continue your investigations, pour out another globule and lay near it a small piece of metal, such as lead, tin, silver or gold, and see with what avidity it will seize on it and never let go. This property is, of all others, the most interesting to us on the Pacific Coast, for so we collect our gold and silver.

Most people know what quicksilver looks like, and probably some of its physical properties; but can any one say why it is liquid at a temperature at which all other metals are solid? Can the reason be given why platinum can only be melted by the high degree of heat generated by electricity, or by the compound blowpipe, while lead melts at 612 degrees, tin at 442 degrees above, and mercury at 39 degrees below zero? Ask the chemist or physicist concerning it, and he will talk learnedly of its specific gravity, its low specific heat, what acids act upon it, what uses may be made of it, and many facts concerning it; but ask him to answer the question propounded above, and he will acknowledge his inability to do so.

The chemist's lore is simply his knowledge of certain physical facts, most of which he obtained from other observers, who have gone before him, with a few discovered by himself and others of his generation, the result in fact of centuries of experimental research.

If our bodies were so constituted that we could endure a temperature of 50 degrees below zero, we might roll our mercury into thin sheets, and wrap our tobacco and soap in them as we do now with tin-foil; and shoot game or conduct warfare with mercury bullets, or eat with mercury spoons and forks. If, on the other hand, we could live at a temperature of 2016 degrees Fahr., which is less supposable, liquid gold might be carried in iron bottles and poured into suitable vessels to be put to some such uses as mercury is now; but mercury, lead, antimony, and some other metals would be in a state of vapor, while platinum would still be a solid metal.

At a temperature at which platinum would remain fluid, gold, silver, and, in fact, nearly all other metals would be in a state of vapor, much as hydrogenium is supposed to be now.

It is not specially difficult to oxidize mercury. Boerhave, the celebrated Dutch physician and philosopher, who died in 1738, made many experiments with this metal. He put a small quantity into a bottle, which he tightly corked and fastened to the sails of a windmill in such a manner that it was constantly agitated. After a time it became wholly changed to a black oxide by motion alone, in contact with the small quantity of air in the bottle. He distilled a portion of metallic mercury 500 times without change.

Mercury is so volatile that it begins to vaporize at a low temperature, even when exposed to the rays of the sun in summer. These vapors are, when strongly heated, highly expansive, and when confined are explosive, as Geoffroy found to his surprise when at the instigation of an alchemist he placed in the fire an iron globe containing mercury, which exploded, and the metal was dissipated in invisible fumes.

If frozen mercury be thrown into warm water, the metal becomes fluid and the water solid at the same instant.

When it was discovered in 1759 that mercury was really a metal, it also became known that it deserved to be classed with the noble metals, gold, silver and platinum, because like them, it does not in melting oxidize. It is malleable when solid, and when by any means it is oxidized, it returns to the metallic state by simple heating alone.

The physical properties of mercury were but little known a few centuries ago. The following is a quaint description of mercury and its properties, quoted from "Pammineralogicon," or "An Universal History of Minerals," by Robert Lovell, Oxford, 1661.

"Place in Spain, Hungary (so the best) and in other places.

"Matter—of much earthy matter and water. Name—Arab—'zaibar'—Barb—'azock.'

"The best is that that lieth in mines neere gold or silver and has the least of arsenical, antimonial, saturnine or cadmiose commixture, and leaves no excrement in the retort, or leaves a yellow or white spot and not dimme or black, being evaporated in a silver spoon.

"It is very cold and moist. It is to be kept in glazen vessels. It consumeth all other matter except glazed vessels. All things swimme therein except gold, which it attracts and purifieth. It serveth to guild with, being mixed with gold, so laid on and put to the fire which disperses the quicksilver, and it may after be separated with aqua fortis."

Cronstedt, one of the earliest writers on modern mineralogy, "System of Mineralogy, 1772," thus gives the views held at that period in relation to the physical properties of mercury:

"The divisibility of quicksilver in the cold might occasion some doubt, whether it really deserved to be called a metal if it had not a right to it from the earliest times, being then recorded among the metals when even they were named after the planets, the number of both being thought equal.

"The opinion that has long time prevailed that the quicksilver is a necessary ingredient and constituent part of all metals is not so generally received now as heretofore, since those processes which have been advanced as proofs of it, and which have, however, but seldom been repeated, do by no means succeed, at least not in all places.

"It is rather supposed that by the mercurial earth the ancients have understood an earth which may by addition of phlogiston be reduced in the fire to a metallic state, and this appears to be so much the more reasonable as quicksilver only attracts the metals in their substances and not in their burnt calces."

Robert Boyle, "Physiological Essays," 1666, Fol. 193:

"And though Quick-silver be, excepting Gold, the heaviest known body in the world, yet when it is reduc'd into vapour it seems to be carried to and fro like other terrestrial particles that swim up and down in our air, for I remember that an expert Gilder not long since complained to me that if, when he evaporated Quick-silver, he forgot to take off Rings from his hand, though they touch'd not the Quick-silver whilst it was in a body, the roving fumes would oftentimes fasten upon the Gold in such plenty as would put him to much trouble to get them off from his Rings, one of which he showed me that he had lately thus whitened, and as it were silvered over with Mercurial fumes and was then to restore to its native Yellow."

Cramer, 1764, "Quick-silver *Mercurious*, though it has no other metallick Quality but its Ponderousness, yet is almost universally reckoned as a seventh Metal. It loses 1-14 Part of its Weight in Water. When pure it is ever fluid, even in the coldest Weather, and of course not malleable. It has the brightness of Silver and it is of the utmost Opacity; being resolved into Fumes by a middling Fire, it evaporates entirely, a few reddish Grains like Sand excepted. These Vapours, however, being collected return into the same Mercury as before."

"Museum Calceolarianum Veronense," by Andrea Chiocco, Verona, 1622 (translation). "The nature of quicksilver appears clearly wonderful, for all other metals placed upon it float, gold excepted. Its nature is light, for by Aristotle, Book IV, it is classed among those that have 'the most lightness,' for it easily flies away in smoke, from this property of exhaling readily. Therefore they enumerate it among the spirits of chemistry.

"Only gold destroys this poison, for when it has first touched it, it permeates it within, breaks it and turns it into dust, emerging itself at last with no character of gold; yet this rises more beautiful from the fire than it was before.

"Scaliger teaches that the substance of quicksilver may be easily understood by the example of water, which when it falls upon dust forms into little globules with the dry material, for it encourages companionship because it gives it the firmness which it has itself. Therefore quicksilver has the same relation in nature that water has in collected dust for it is earthy water, or watery earth, not without much air. Hence it plainly confutes Cardanus who wished quicksilver to form globules with dry dust, because, escaping the contact of the dry earth, it tries to concrete by permeating it, and since it forms into globules in water and in lead filings, which it does not avoid, leaving it unwillingly and taking from it as much as it can.

"Gabriel Fallopius, skilled in many experiments and of most acute talent, teaches in many ways that quicksilver is hot and dry; that there are two things in it—air indeed, but in small quantity, yet as much as will eliminate the earthy substance; the other is earth in great amount, so that out of 100 parts 80 are earth and the rest air.

"On that account if hydrargyrum is touched, it does not leave the hand moist, nor the place which it touched. Although affected by the air, it is not destroyed by it. On account of the large proportion of earth they thought, indeed, this would happen, which Fallopius disproved, since it is easily dissolved by the sun and by fire, which is small proof of the mixture. It is therefore on account of the small quantity of air that it does not moisten things. Neither is the earth which dominates in quicksilver pure and crude, but sooty, baked and exceedingly attenuated, so that enduring heat with difficulty it flies away in smoke, which would not happen to crude earth. On account of this sooty earth, also, it easily rises, not by reason of the air, which this author plainly shows."

Congelation of Mercury.

The discovery of the fact that mercury, like other metals, can be brought to a solid state by subjecting it to a sufficiently low temperature, was accidental.

A brief history of this remarkable discovery and of a series of experiments made at various times and at sundry localities, compiled in part from a very full paper on this subject by Dr. Charles Blagden, and published in the Philosophical Transactions for the year 1783, Folio 73, may be given as follows:

Prof. J. G. Gmelin was sent with a party of scientists, by the Russian Government, to explore the territory of that nation in Europe and Asia. The expedition left St. Petersburg in the summer of 1733 and remained absent for ten years. During the winter of 1734–5, while stationed at Yeniseisk in Siberia, on the great river Yenesei, in Latitude 58 30 and Longitude 92 east, the weather became exceedingly cold. Mercury actually froze and sank out of sight in his thermometer. When the metal refused to move in the tubes, although he recorded the fact, he attributed the phenomenon to the vinegar and salt with which the mercury had been cleaned, and never suspected it was congealed. When the thermometer fell to –120 he did not know that below –40 the excess was due to the contraction of the frozen metal.

In the winter of 1736–7 while at Yakutsk on the river Lena, in Siberia, Lat. 62 N., Long. 130 E., De Lisle, a member of the Scientific Corps, informed Prof. Gmelin that the mercury in his barometer was frozen. De Lisle was probably the first man who ever looked on mercury in a solid state. The phenomenon was attributed to the same cause. Prof. Gmelin entered the fact in his record and mentioned that he tried to force the obstruction down with a wire.

In 1759, J. A. Braun was Professor of Philosophy at the Imperial Academy of St. Petersburg. Dr. Zeiher, also a professor in the same institution, who, in another country, had experimented with freezing mixtures and knowing the excessive cold of the Russian capital would greatly facilitate such experiments, proposed to Prof. Braun to continue the work; he being an invalid, but neither had any idea of congealing mercury, but only of ascertaining how low a temperature could be obtained by artificial means.

On the 14th day of December, 1759, the thermometer standing in the open air at –34 degrees Fah., Prof. Braun prepared a mixture of nitric acid and pounded ice, by which he reduced the temperature to –69. The mercury in his tube was frozen, but he did not notice it at first. In a second experiment he substituted snow for pounded ice, and was astonished to find the instrument to indicate –100, –244, –352, successively. Removing the bulb, he found the mercury immovable, and it remained so for 12 minutes in the cold air. Still not realizing that the metal was solid, he repeated his experiments with other mixtures and obtained the same result. It then dawned upon his mind that the metal was frozen. Relating his experience to the Academy, Prof. Aepinus was requested to join him in another trial, with similar results. They broke the bulb of the thermometer and obtained a ball of solid, lustrous mercury, a sight never before beheld by man. It was slightly harder than lead, and so malleable that it was considerably flattened by blows from a pestle in a common mortar.

Prof. Aepinus at the same time experimented with glass vessels like modern test tubes, in which he easily froze mercury which cooled with a concave surface, and the ingots obtained sank in fluid mercury. It will be seen that this discovery was purely accidental, for had Prof. Braun used spirit thermometers in his experiment, the world might long have remained in ignorance of this singular fact.

During the winter following, Prof. Braun repeated his experiments, but did not discover his error in supposing that so low a temperature was required. He published the results of his experiments in 1767 and died in the following year.

In 1772, at Krasnoiarsk, a Siberian town on the river Yenesei, Lat. 56.30 N., Long. 93 E., Dr. P. S. Pallas, a celebrated Prussian naturalist, who, by his discoveries in Siberia laid the foundation for modern geology, then in the employ of the Russian Government, caused mercury to freeze by exposing it to the natural winter cold of that rigorous climate. On the 6th and 7th of December, the weather being extremely cold, mercury froze in his thermometer. He exposed three-fourths of a pound of mercury in a bowl in the open air; in an hour the edges were congealed. Soon after the surface froze over and the metal became a solid mass, more flexible than lead, and when hammered out thin seemed somewhat granular. If the hammer was not perfectly cooled a portion of the mercury separated in drops. In a warm room it gradually melted like wax on a fire. When broken to pieces while granular the fragments adhered to each other and to the bowl. When touched, the metal melted but the fingers were benumbed. This seems to have been the first instance where a considerable mass of solid mercury was handled and closely examined.

In 1774 Mr. Blumenbach, a student in Gottengen, placed mercury in a frigorific mixture on a cold night, the temperature being –10 Fah. He obtained solid metal in irregular fragments, of a bluish-white lusterless color like zinc. Scientific men of that period thought it was crystalline or only partly congealed.

In 1775, at Albany Fort, on the shores of Hudson's bay, Lat. 52.14 N., Long. 82 W., Thos. Hutchins, Governor of the fort, made a series of experiments with mercury at a low temperature. On the 19th of January, the temperature being –37, he repeated the experiments of Prof. Braun, using nitric acid and snow. The quicksilver in the thermometer was frozen, the glass broken, and the mercury bullet flattened under the hammer with a dull sound like lead. When the bullet fell six inches it was visibly flattened. It was lustrous and finely polished on the surface. An account of these experiments may be found in Volume 66, Philosophical Transactions, 1776, Fol. 174. This work is in the Mechanics' Library in San Francisco.

In the year 1780, January 4th, the cold at Vytegra, a town in Russia lying in Lat. 61 N. and Long. 36 E., being 34 degrees Fahr., M. Von Elterlein exposed during the night three ounces of mercury in a china cup, covered with paper pierced with holes. The next morning the metal was solid and looked like a piece of cast lead with a considerable depression in the middle. In attempting to remove it from the cup, the knife raised shavings as if it had been lead. He succeeded in removing the mass, and took it in his hands to try if it could be bent or broken. It was like stiff glue and broke into granular fragments. His fingers lost all feeling and it required an hour and a half rubbing with snow to restore circulation. At eight o'clock, the thermometer standing at –40 degrees, the fragments resembled amalgam. When the temperature became –39, the metal was fluid.

In the winter of 1781–82, at Albany Fort, Hudson's Bay, Governor Hutchins, by request of the Royal Society of England, repeated his experiments of 1775 with great care. The result he sought and obtained was the determination of the temperature at which mercury became solid. He selected the coldest nights, and keeping the thermometers, apparatus and chemicals at the low natural temperature, mixed snow and nitric acid, already very cold, and immersed the bulbs. The result showed that 40 degrees below zero of Fahrenheit was the point at which the metal congealed, and it could be cooled down several degrees below while at rest, but if disturbed it froze and immediately rose to –40 degrees. In one experiment the temperature fell to –79 degrees, the metal still remaining liquid. Mercury contracts very much when in a solid state, calculated to be one twenty-third part of its volume, and this shrinkage was in earlier experiments mistaken for a much lower temperature.

No mercurial thermometer can therefore correctly indicate a temperature below –40 degrees. The solid metal obtained was bright and lustrous as when liquid. It was hammered out roughly and found to be quite malleable.

January 26, 1782, the thermometer standing at –40, he succeeded in obtaining solid metal in the open air without artificial aid. In a two-ounce vial tightly corked, he put ½ mercury and exposed it to the natural cold; although it froze, the metal was granular or crypto-crystalline. When hammered, it crumbled like a badly melted ingot of any other metal. Before these experiments were made it was generally believed by scientists that mercury could only be crystallized at a temperature below that actually required. Some set the figure at from 500 to 600 below zero; but few thought it possible below –100. A full account of these experiments may be found in Vol. 73, Philosophical Transactions for the year 1783, Fol. 303.

Mr. William Coxe, an English historian, traveler and author, in 1784–5 witnessed in St. Petersburg experiments made by Dr. Guthrie, physician to the Imperial Corps of Cadets; the results did not differ materially from those obtained by Professor Braun and Governor Hutchins.

December 22, 1784, during a cold, clear evening, the thermometer (Reaumur's) indicating 17 degrees below zero, he exposed pure mercury and an amalgam of tin, and proved the freezing point to be 32 degrees below zero.

January 9 and 10, 1785, Dr. Guthrie experimented in the presence of Mr. Coxe, Prof. Pallas and others. Mr. Coxe quotes Prof. Laxman to the effect that in Siberia, in 1702, mercury remained solid in the open air for two

months together. An account of these interesting experiments may be found in "Coxe's Travels in Northern Europe," London, 1802, reprinted in Pinkerton's Voyages and Travels, 1812, Vol. 6, Fol. 690.

Mr. Walker, an apothecary at Oxford, England, on the 2d day of April, 1787, congealed mercury by the use of frigorific mixtures. The apparatus consisted of four pans diminishing in size, one within another. The mixtures were placed in each in such a manner that the outer cooled the inner. The materials used were nitric acid, sulphate of soda and nitrate of ammonium.

In Vol. 3, Fol. 76 of the Philosophical Magazine, published in London in February, 1799, a copy of which is in the Mercantile library of this city, may be found a communication from W. H. Pepys, an English chemist and philosopher, describing his success in congealing 56 pounds of mercury at one operation. The apparatus used is also figured. On the 30th day of January, 1799, the temperature of the laboratory being 40 degrees F., he obtained snow for the experiment. He placed in an earthen pan equal parts of muriate of lime having a temperature of 40 degrees, and snow at 32 degrees; they became liquid, but acquired a temperature of 32 degrees below zero. In this mixture he immersed other vessels of snow and muriate of lime, the temperature of which was reduced by this means five degrees. These, mixed, produced cold indicated by 50 degrees below zero; a small retort containing four ounces of mercury was introduced into the latter mixture and the metal became solid in 15 minutes. It congealed from the outer edges inwardly like cooling wax. He broke the retort and struck the metal repeated blows with the hammer; the first indented it somewhat, but it yielded to the last and broke like zinc. He thoughtlessly picked up one of the fragments, and immediately experienced a sensation as if wounded by a sharp instrument; his hand was bloodless and dead to all appearance. The mercury in the meantime became fluid. The experiment was repeated, but the metal was introduced in a small glass tube. It became fixed in two minutes. The tube was broken and the metal bent at an acute angle with a pair of pincers. An attempt was made to straighten it, but the mercury liquefied.

Feb. 28th of the same year 56 pounds of mercury were put into a strong bladder, placed in portions of the freezing mixtures successively, by which the temperature of the mass was gradually lowered. In an hour and 40 minutes it became solid, and the temperature was found to be 46 degrees below zero. The mass was granular like hard amalgam, more than a solid metal. In lifting it from the frigorific mixture it broke into several pieces. A number of persons in the room took pieces in their hands and suffered much in consequence.

Dr. Henry, in his "Elements of Experimental Chemistry," 1814, describes and figures an apparatus in which mercury can be frozen by muriate of lime and snow. The metal is first reduced to a low temperature by another freezing mixture.

In 1875, January 8th, in Montana, the spirit thermometer fell to 35 degrees below zero. Mercury was placed in a tumbler and exposed; at 9·40 P. M., the same thermometer falling to –41 degrees, the metal was frozen. It was carried in this condition into a store and examined by a number of persons.

In 1876, at the Eureka Mill on the Carson river in Nevada, the weather became very cold, and it was found that the mercury pumps did not work. On examining the tanks it was found that the quicksilver was solid. It was cut into cakes with a shovel and carried up to the pans above, at least it is so stated in the MINING AND SCIENTIFIC PRESS, Vol. 32, Fol. 98; but it is the opinion of the writer that there must be some misstatement.

Chemical Properties.

Mercury is insoluble in hydrochloric acid, but yields to nitric acid and forms salts which are those of the suboxide if the acid be cold and dilute, and of the oxide if applied concentrated and boiling. All the salts of mercury and the metal are volatile; some unchanged, others being decomposed.

The salts of the suboxide in solution behave as follows with reagents:

Hydrosulphuric acid or sulphide of ammonium throw down black sulphide of mercury insoluble in dilute acid, sulphide of ammonium or cyanide of potassium.

Soda or potassa cause black precipitates of suboxide of mercury, insoluble in an excess of the reagent.

Hydrochloric acid or solution of soluble chlorides precipitate white subchloride of mercury.

Protochloride of tin precipitates metallic mercury as a gray powder; by boiling and careful manipulation the metal may be collected into one globule.

A bright surface of copper precipitates metallic mercury from a neutral or slightly acid solution of a suboxide salt. The best way to obtain this reaction is to place a drop of the solution on the horizontal surface of the copper, and after a time rubbing it with a piece of rag or filtering paper.

In solutions containing salts of the oxide, hydro sulphuric acid or sulphide of ammonium (in small quantity) throw down a perfectly white precipitate, while an excess of the reagent yields a black precipitate of the sulphide which is soluble in sulphide of potassium. These reactions are characteristic of mercury.

The sulphate and nitrate are decomposed by water in large quantity.

Mercury as a Medicine and as a Poison.

It is a curious fact that no matter how poisonous a substance may be, or how deleterious its effects, physicians begin to experiment with it, and prescribe it as a medicine as soon as known. Even the Woorari, the most deadly of poisons, is not an exception. If the Upas has not been so tried, it must be owing to the difficulty of procuring it.

The Romans, well acquainted with the toxic properties of mercury, considered it the base or cause of all poisons (*venenum rerum omnium*), but as drugs they used no other mercury compound than cinnabar, with which they prepared liniments for rubbing on the stomach and head.

The Arabian physicians and alchemists were familiar with mercury. Rhazes, about 930, who first studied smallpox, used it medicinally but externally, against vermin and cutaneous diseases. But Paracelsus was first to employ it internally.

Theodoric, an Italian surgeon and friar, who died in 1296, recommended the use of mercury as a medicine in some diseases.

Juan Almenar, a Spanish physician, early in the tenth century, in a medical work of which he was the author, advised the use of mercury in "Lues Venerea."

Metallic mercury taken into the stomach produces no injurious effects; it has, in some cases, been used mechanically to remove some obstruction in the bowels. But it is a question if the introduction of a pound or more of quicksilver for that purpose is judicious or safe.

The salts of mercury are all poisonous, some much more so than others. Yet in a proper form and in suitable doses, it is considered a valuable and in some cases an indispensable medicine.

It is generally used internally in the form of Blue Pill or Calomel, described elsewhere, sometimes externally as mercurial ointment, or in the form of a lotion. Half a century ago it was more extensively employed than now, and with pernicious effects on humanity. It is thought by some that mercurial diseases following its use were far more injurious than the diseases it was employed to cure.

The symptoms of mercury poisoning, hydrargyrosis, salivation or ptyalism are first a metallic taste in the mouth and a soreness of the gums. When the teeth are tightly closed, a sense of looseness is felt. This is soon followed by a swelling of the gums. The breath has a peculiar and very disagreeable odor called the "mercurial fetor." The saliva flows excessively, and in extreme cases the gums, tongue, throat, and face swell. The tongue is covered with a thick white coating; ulcers form; the saliva literally flows from the mouth in streams, and unless relief is obtained, great debility and death follow.

Artificers who use mercury, for example, firegilders, mirror manufacturers, miners and millmen, and especially quicksilver miners, long exposed to mercurial vapors, are frequently afflicted with shaking palsy and other forms of mercurial disease.

It is not necessary to take mercury into the stomach to produce poisoning, but the skin, the mucous membrane, and the lungs absorb by long exposure the vapors of this metal and become diseased, the malady extending to other parts of the body. The bones are affected and begin to decay; the first step is periostitis, followed by caries.

The effect on the skin is to produce perspiration, followed by eruptions and ulceration. The poisonous effects of mercury are sometimes accompanied by other alarming symptoms, as ozena, irilis, neuralgia, rheumatism, gout, loss of the hair, swelling of the glands, swelling and induration of the liver, trembling of the limbs and paralysis.

When the magnitude of quicksilver mining and metallurgical operations in California and the use of mercury in our gold and silver mines are considered, instances of salivation are very rare. This must be attributed to the superior skill and intelligence of those so engaged and to the perfection of mining, the result of evolution which has made the California miner the best the world has ever produced. This is no empty boast.

Quicksilver miners suffered more in California from the effects of mercury in former days than now, if we are to accept the statements of earlier authors. Bartlett, 1855, wrote as follows: "Those who work in the mine (New Almaden) were uninjured, but salivation was too common at the works; the men were relieved every three or four weeks; horses and mules were salivated; 20 or 30 die every year from the effect of the mercury. Seven or eight days were required to fill the furnaces and extract the refuse, the latter being the most dangerous operation, but it was done as much as possible in the open air. The furnaces were covered with a roof, but otherwise were open."

A gentleman, formerly superintendent of the St. John quicksilver mine in Solano county, California, informed the writer that on one occasion, it being required to make an examination of the interior of the furnace and being too considerate to expose his men to danger, he entered himself and in consequence was badly salivated.

Metallic poisoning among miners and workmen in quicksilver was very common a century or more ago. Instances of mercurial poisoning are often met with in the books of that period. Valmont de Bomare, 1775, wrote as follows: "All authors agree that the Indians and those who take the fluid mineral from the mines do not live long, and that they become paralytic and consumptive, which they attribute to the effects of the mercurial vapors on the nervous system. It is said that only condemned criminals work in this sort of mine. The reduction works where they distil the mercury at Idria are some distance from the mines; they give off a very disagreeable smell; animals dislike to graze near them, and the workmen are relieved every month; the turn of each workman comes but once in a year. Those who work underground in extracting virgin mercury are changed every fortnight. They go up and work the mineral in the free air. This prolongs their lives a little. Those who have seen these workmen say that their sweat looks almost like tears of mercury; they relate of Idria that those employed in that mine are willing workmen, and are sick but little; they are relieved every few days."

A singular case is cited by an old writer who visited the quicksilver mines of Friula (Idria) in 1664. Description of the Idria Mines by Walter Pope, Phil. Trans. Vol. 1, 1665.

"The laborers work for a julio per day, which is not above six or seven pence, and endure not long, for although none stay underground above six hours, all of them in time (some later, some sooner) become paralitick and die hectick. We saw there a man who had not been in the mines above half a year, so full of mercury that putting a piece of brass in his mouth and rubbing it with his fingers it immediately became white like silver; I mean he did the same effect as if he had rubbed mercury on it, and so paralitick that he could not with both hands carry a glass half-full of wine to his mouth without spilling it, though he loved it too well to throw it away. I have been since informed that here in Venice those that work on the back side of looking-glasses are also very subject to palsey. I did not observe that they had black teeth; it may be, therefore, that we accuse mercury unjustly for spoiling the teeth when given in venerial diseases. I confess I did not think of it upon the place, but black teeth being very rare in this country, I think I could not but have remarked it had all theirs been so."

This account reads as if there were some deception practiced, or that facts are misstated.

When the amalgamation of silver ores was introduced into South America, mercury was sent out from Spain to supply the miners. In those days there were no iron flasks, the quicksilver was tied up in bags and stowed in the hold of the vessels carrying it. Sometimes during heavy weather the bags got adrift and some of the metal escaped. When passing through the tropics on the long passages, the mercurial vapors sometimes produced disease among the passengers and seamen. With this experience, when, as was frequently the case, the ships were captured by buccaneers, the sailors of the captured ships went below and cut the bags of quicksilver in the cargo, and protecting themselves by remaining on deck until the captors became salivated and broken down in health, conquered them and recaptured the vessels. This fact or fiction has been frequently written in old histories and romances.

The following extracts from Lovell's "Pamineralogicon" show that mercury was largely used as a medicine in his time, and that he was well aware of its poisonous properties:

"It looseneth the teeth. The Water whitens the face. The sublimat in three hours corrodes the body.

"The use of crude mercurie is both inwardly and outwardly, seldom inwardly, and then in pills. Outwardly in unguents in which it showeth not itself; and in plaisters for the itch to be applied to the joints, but it's carefully to be used for being anywhere applied it causeth putrifaction by salivation.

"Being taken in too great a quantity it breaketh the intrails by its weight.

"Waters running by mercurie if drunk, is carried to the head and thence falls to the gummes hurting them, and the limbes as appears by the ointment of quicksilver.

"The common mercurius dulcis doth gently purge forth all noxious humors without trouble insomuch that it may be given to infants.

"Mercurie precipitate per se, doth strongly cause sweating, and given 6 or 7 times doth eradicate the French disease" (syphilis).

"Fixed mercurie panacea doth dry up all noxious humors and as a diaphoretical, expelleth the same. The solar precipitate doth mightily cleans the bloud and the whole body from the French disease."

In an article on mercury and its application to medicine, on 7 octavo page, this author makes mention of the following mercurial medicinal preparations:

1. Aqua Aluminis Fallop. 2. Aquila alba. 3. Aquala caelestis. 4. Arcanum corallinum. 5. Aurum vitaea. 6. Common precipitate. 7. Compound coralline arcanum. 8. Crude mercury. 9. Draco mitigatus. 10. Fixed mercury panacaea. 11. Incarnate precipitate. 12. Jovial bezoardick. 13. Jovial liquor. 14. Liquor gummosus. 15. Liquor of mercure. 16. Lunar bezoardick. 17. Manna mercurii. 18. Mercurius corallatus. 19. Mercurius dulcis. 20. Mercurial laxative. 21. Mercurie of life, corrected. 22. Mercurial oil of Antimonie. 23. Mercurie precipitate per filices. 24. Mercurie per se. 25. Mercury precipitate per se. 26. Mercurie precipitated by oile of sulphur. 27. Mercurie precipitated by tincture of smiris. 28. Mercurie precipitated by water of egges. 29 Mercurius vitaea. 30. Minerall bezoardick. 31. Minerala laxitive. 32. Oyle of mercurie antimoniate. 33. Pulvis angelicus. 34. Purging panacaea of mercurie. 35. Solar precipitate.

The Plumas Eureka Mine.

EDITORS PRESS:—By courtesy of Sup't Hoskins we were shown through the works by Mr. Johns, who is acting assayer, amalgamator and silverplater for this great mine.

They are now running 60 stamps in a mill whose heavy timbers, thorough bracing, substantial machinery, labor-saving devices, as well as elaborate plant for saving gold, convey the impression of thorough practical knowledge backed by plenty of capital. Besides a good water-power they have fine large boilers, supplying steam to a heavy engine and a large air-compressor. The engine alone runs 40 stamps when needed.

Knight's Water-Wheel

Has been in use many years with great satisfaction in places where water has heavy pressure. The design is much like the Pelton wheel, advertised in the PRESS. Mr. Johns said that a wheel that had been in use eight years, when broken by carelessness and removed, showed no signs of wear. They also use Knight's water engines for pumping in the mines. Mr. Johns speaks highly of Hendy's ore-feeder, and also of the Blake crusher, which greatly amused us by the apparent ease with which it crushed the hardest quartz. At one side of the mill were piled cords and cords of cast-steel shoes and dies. It looked as though they must have imported them by the shipload.

Comfort of the Men.

The devices for drying miners' clothes and toilet conveniences, also the rooms for the brass band, as well as school and church facilities, carry the idea that big-hearted men are at the helm here. This was confirmed by the complaints of the saloon-keepers that the town was no good at all. One of them said that instead of miners coming in to have a good time every Sunday and give business-men a chance, as they did at other places where he had been, you would see the superintendents starting off for church every Sunday morning and a long string of men following them. He did not understand how high a compliment he was paying. Farmers don't know what they should do without the Johnsville market. Saloon-men say they will have to move away. The Plumas *National* will soon have an elaborate article from data furnished by the management of the mine, and for that reason we dismiss the subject with a much less extended notice than its importance would warrant.

We were surprised to see seven or eight arastras running away down below the mill, and to learn that Italians were paying some royalty and still making a living from the tailings of this mill, where all modern gold-saving devices seem to be used to best advantage.

F. S. C.

A POWDER COMPACT.—The California Powder Co., Giant Powder Co., Vigorit Powder Co. and Safety Nitro Powder Co. have formed a compact to last five years, and the percentages are as follows: California Powder Co., 37½; Giant Powder Co., 37; Safety Nitro, 16; and the California Vigorit, 9½. The price of powder to the trade has been established by the combination as follows: Forty per cent powder, 18 cents per pound net in carload lots and 20 cents per pound for less than carload lots; 50 per cent powder, 23 cents for carloads and 25 cents for less; 70 per cent powder, 28 cents for carloads and 30 cents for less; 30 per cent powder, 15½ cents for carloads, 17½ cents for less. This is an average advance of about five cents per pound over the previous rates. The local combine is also associated with all the Eastern and Western companies in the United States, and also with all the dynamite-manufacturing companies in Europe, regulating the prices of all foreign trade.

THE steamship City of New York was laid up about two weeks ago, and is now at the Union Iron Works undergoing repairs which are to be so extensive as to detain her in port fully three months. Her boilers are to be taken out and new ones put in. She will be thoroughly overhauled and refitted throughout. The saloons and staterooms are to be refurnished and newly upholstered. She will be cleaned and painted within and without, and lighted up above and below with incandescent electric lights.

HEREAFTER any one so desiring can deposit gold coin at the Sub-Treasury in $5000 or $10,000 sums and receive therefor a gold certificate drawn to his order. These certificates will be payable on demand when presented at the office with the indorsement of the person to whom they were issued originally.

THE attorneys for the Bulwer Con. Company of Bodie have made application for a new trial, the management being dissatisfied with the damages of $3000 awarded in the suit with the Standard.

A PROSPECTOR named Long left Elko, Nev., some weeks ago to search for the famous Lost mine. Last week his dead body was found on the Honey Lake road, two miles from Granite Station.

NINETEEN live sea-lions have been taken to Chicago from this coast.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

BUNKER HILL.—*Ledger*, Aug. 17: The Bunker Hill has again started full blast, a sufficient quantity of water flowing in the ditch. The Keystone is dropping her 40 stamps again, 20 of which were closed down for lack of water. The South Spring Hill on the arrival of the water put on their full force and the mill worked to its full capacity.

SUTTER CREEK.—The extra 10 stamps of the Wildman mill were started last Monday. It required an hour or so to adjust the feeders, etc., after which everything moved along like clockwork. The entire mill is lighted with electricity, even the amalgamating room. It presents a very striking and attractive appearance after nightfall. The new Triumph concentrators are running all right, but the test referred to will not be tried for about a month, as it will require that time to fill all crevices in the batteries and even to get the concentrators in good working shape. The compressor is not put in the mine yet on account of the rush of work at Knight's foundry, but it is expected to be at work by the first of next month. The superintendent, Mr. Tregloan, has given everything his closest personal attention and it is easily to be seen that economy is made one of the principal features of the management. The mill has been painted red on the outside and is having a thorough coating of white on the inside, which will save at least half an hour's lighting every day.

Butte.

MINING THE FEATHER'S CHANNEL.—Oroville *Mercury*, Aug. 15: Water was turned into the flume of the Golden Gate mine Thursday, and they are rapidly preparing to mine the channel. It will require some days to get the entire stream into the flume, and put in the elevators, sluices, etc., for mining, but the great work is progressing with all possible speed and in the most thorough manner. The big dam and flume and the mining operations will afford a sight to people who are not familiar with such gigantic mining enterprises.

Calaveras.

WHISKY SLIDE.—Calaveras *Prospect*, Aug. 10: Deffenbach and Madona are opening up their quartz mine at Whisky Slide at present, and the lode prospects uniformly throughout. The owners have just completed cleaning out their old shaft, and find that the vein in the bottom is six feet wide and of a decomposed quality that will insure an easy working by the arastra process. Several other veins are being opened up in that vicinity, and our informant says the settlers of that region have great faith in the future of their neighborhood.

WATER SUPPLY SHORT.—Angels *Echo*, Aug. 17: The sudden failure of the water supply in the mountains is a great disappointment to the people of this town. It will throw nearly 200 men out of employment, and dull times may be expected as a natural consequence. The mills will all be compelled to shut down, and it is a matter of doubt whether or not there will be a sufficient quantity of water to keep the mines pumped out.

CLOSED DOWN.—The Brunner mine at Albany Flat has been closed down for the present. Operations will probably again be resumed in the near future.

El Dorado.

FREE GOLD.—Georgetown *Gazette*, Aug. 15: The Ben Franklin is now some 60 feet prospected by shaft and is making a good showing in free gold.

Inyo.

RAILROAD.—Cor. Inyo *Index*, Aug. 14: The projected railroad through Townsend Pass and Panamint Valley will open the richest mineral country in the United States. Telescope Range of mountains, dividing Death and Panamint Valleys, has a mineral belt of some 40 miles in length, rich in ledges carrying high-grade ores of gold, silver, lead, copper, antimony, iron and other metals, while the valleys on either side have practically inexhaustible deposits of salt, soda and borax. Argus Range, on the west side of Panamint Valley, is traversed by innumerable ledges carrying precious and base metals, which are unworked from want of economical methods of treatment. Deeming an abridged description would be interesting, we will commence at the northeast corner of the Argus Range where Lee mining district is situated. The ledges are in the silurian formation, carrying horn silver, galena, sulphuret of silver, black metal and carbonate ores, rich in precious metals. Passing south through the range on the Eastern slope, a short distance from the valley, the water has cut a wide and deep gorge. The hills on either side of the canyon, which is named Darwin Wash, are bold and rugged and of a lime formation, containing enormous bodies of carbonate and sulphuret silver-bearing lead deposits, and rich veins of quartz, carrying gold and silver, have been exposed and worked sufficiently to demonstrate their value. Lookout district, some 14 miles south, has a group of rich argentiferous lead-bearing mines, from which several hundred tons have been extracted and shipped this year. On account of the great expense, none but the choicest ores can be handled.

REVENUE DISTRICT.—Again southerly in the foothills, about six miles, lying in black lime, porphyry and granite formation, we come to Revenue District, discovered by Robert Mitchell, who was also the discoverer of Reveille District, Nevada. A large amount of work has been done, the veins being rich in sulphurets, antimonial and horn silver. Ledges of copper and argentiferous lead have been exposed but now lie idle, as no practical means for successful treatment of the ores after extraction retards progress in this quarter. In the near vicinity, and of easy access from the valley, enormous veins of copper and lead crop out, upon which scarcely any work has been performed.

SHERMAN DISTRICT.—Passing Knight and Wetherill canyons, both rich in mineral-bearing ledges, Sherman District is reached, being about 16 miles south of Revenue. The rock formation here is porphyry, granite and lime, the ledges being in some cases contact veins bearing free gold and silver. Between this point and Lee District, a distance of nearly 50 miles, the mineral belt follows the mountain range, rising and dipping, forming a net-work of mineralized veins the most prominent of which have been mentioned. Thousands of undiscovered ledges exist that in the future will become metal-producing sources.

SNOW'S CANYON, six or seven miles farther south, is in lime and granite porphyry formation. A great deal of work has been done, developing numerous ledges of gold, silver and platinum. Croppings of copper and lead ores protrude above the surface but are untouched, being considered worthless at present. Many of the veins contain free milling quartz, nothing being done with them beyond assessment work, in consequence of their isolation.

SEARLES' BORAX WORKS.—Leaving Sherman District, traveling about 20 miles southerly and over a plateau a few hundred feet above Panamint valley, Searles' Borax Works and Marsh are reached. Here we find a large force of men engaged in collecting the crude material, which, after being treated in the refinery, is shipped by mule-teams to Mojave, some eighty miles south, whence the Southern Pacific Railroad conveys it to San Francisco and other markets. The marsh and works are about three miles south of the Inyo boundary and in San Bernardino county. Easterly, over the marsh and through drifting sands as white as that gathered along the sea-shore, we toil up New York canyon to the summit. A short distance from the mouth, numerous ledges of ferruginous gold-bearing quartz crop out, some of which have been developed to sufficient depth to demonstrate their merits and obtain patents from the U. S. Government. Some four or five miles farther up the canyon, in a slate formation, the Alta Consolidated Mining Company have their patented mines, owned and controlled by J. B. Haggin of San Francisco. The ores, being mostly free, are easily worked. Two hundred tons of second quality ore from this mine was worked last year at the mill in Sherman district.

Los Angeles.

ORO GRANDE.—Cor. *Miner and Artisan*, Aug. 17: One of the most promising mining camps in Los Angeles county is Oro Grande. The discoveries and developments of the past few months have been quite unexpected and almost unprecedented in the mining history of later years. It is true no great parade has been made of the mineral wealth of Oro Grande, but the gold and silver veins are there, and their value, to some extent, has already been proven. The Adams Bros. gold mine has a splendid reputation among all who are familiar with it. The Clinker mine is also said to be a valuable property. A sale is now negotiating for $60,000. The Collins mine, recently discovered in a lime quarry from which lime rock was being taken for burning in kilns at Oro Grande, is also looking well. These are but three of quite a large number of mines about Oro Grande, the united value of which may in time bring a comparatively obscure little district and village into great prominence.

Mariposa.

MALONE.—Mariposa *News*, Aug. 17: Messrs. McCormick and Hay have purchased the engine belonging to the Chinamen at Mormon Bar and are having it put in running order to use as a hoisting power at the Malone mine.

Mono.

BODIE.—*Free Press*, Aug. 19: During the past week south drift from joint winze, 1000 level, was advanced six feet, with a small streak of rich ore. South drift from west joint crosscut from joint upraise was advanced 24 feet. West crosscut from south drift, 1200 level, was advanced 10 feet.

THE BODIE CON.—During the past week north drift from joint winze, 30 feet below 1000 level, was advanced 18 feet. A small streak of rich ore is found in this drift. West crosscut, No. 2, from north drift, 1200 level, was advanced 13 feet. North drift from west crosscut from shaft 1200 level was cleaned out, retimbered, and work was resumed in the face of same yesterday.

Nevada.

IDAHO MINE.—Grass Valley *Union*, Aug. 15: With the aid of the steam pumps the water in the Idaho incline has been lowered to the No. 15 level, that point being reached on Tuesday evening, and the flow of the level was reached yesterday. This will enable operations to be resumed on No. 15, which has been under water ever since the accident which occurred on the 5th of June. The pumping will be continued until the No. 16 level is reached, which is the lowest working level in the mine, and it will take several weeks more to accomplish this. There are now four steam-pumps in use in the mine besides the main pump, which is driven by water-power. The steam-pumps are stationed respectively below No. 14 level, at No. 13, No. 12 and No. 10, each taking water from tanks as it is forced up from below, the last lift being from the No. 10 to No. 8 level, where the main tank is, and from which the water is pumped to surface by the big pumps. The steam-pumps now in use will probably be kept permanently in place after the lower levels are drained, to meet any contingency of being again flooded.

MAKING AN UPRAISE.—The recent strikes of a large vein in the east of a drift of the 180 level of the Crown Point mine has determined Mr. Gauthier to make an upraise to the surface at that point for the more convenient transportation of ore to the mill. The upraise will be about 210 feet, coming to the surface on the hillside east of the works, and from thence a tramway will be laid to the mill. The power to run the hoist at the upraise will be transmitted by rope-cable from the main hoisting works, which are situated over the main shaft.

NEW EUREKA.—*Tidings*, Aug. 15: We are informed by Mr. Weldon that, judging from the outlook, work on the New Eureka will be resumed in a very few days. So mote it be. Mons. Gauthier proposes to make an upraise from the point in the 180-level where the recent strike was made in the Crown Point. This is to enable more economic work. The upraise will come to the surface on the hillside east of the works, from which a tramway will be laid to the mill. Power will be transmitted from the present works, by wire cable, for hoisting from the upraise.

Placer.

HOGSBACK.—Placer *Republican*, Aug. 15: On Tuesday of last week the miners at the Hogsback mine struck 20 inches of water, which flowed so fast that the shaft was soon filled to the top, and they barely had time to get out their pumps. The shaft had been sunk 250 feet lower than the tunnel. As the whole works were soon filled up, the only thing to do was to quit work and await instructions from Paris. It is expected that the company will begin work on a new tunnel which Supt. Ralston hopes to commence about September 1st. It will be located 300 feet lower than the old one, and will be 2250 feet long, or 567 feet longer than the old one. It will require about ten months to run it.

YIELDING WELL.—Placer *Argus*, Aug. 17: The Breece & Wheeler mine at Bath is yielding the richest ore that has been taken out for years. An increased force has been placed on the mine. T. M. Tharpe and White are taking out rich ore at the Old Moore mine on Duncan hill. Over $1000 was pounded out with a hand mortar from decomposed quartz last week.

Shasta.

IGO.—Cor. Shasta *Courier*, Aug. 17: The Red Bluff parties who are interested in the Crystal have also bonded the two Chicago properties and are repairing the mill and taking out ore. P. Gibney is still crosscutting on his ledge, the rock being very hard. Wright's arastra is running on ore from his Greasewood ledge. Shirland's arastra is running on Atlantic ore. E. L. Ballou's arastra is running on Falls and Manzanita ore. Litten has found some good-looking silver ore on one of his ledges. Whit George has struck it very good in his Muletown ledge.

FRENCH GULCH.—Redding *Free Press*, Aug. 17: Mr. A. Reaves, who was in from French Gulch on Tuesday, informs us that Fox, Van Mater and Johnson are working some very fine ore at the Wheeler mill on Kline gulch, which they had taken out of their location east of the Wheeler claim. At Deadwood, the old Willey mine is again coming to the front, and turning out some very rich ore. George Kline has let a contract for 150 feet of tunnel into the Bismarck claim. The syndicate which has purchased W. T. Coleman's mining property promises to make things lively at the Gulch.

OLD DIGGINGS.—Mr. Perham of Redding has obtained the contract for hauling ore from the Mammoth mine to the Central mill. The foundation for Walker Bros.' new mill is finished, and the machinery is being hauled down from Star gulch.

Sierra.

GRAVEL AND QUARTZ.—Sierra *Tribune*, Aug. 15: The Golden Star drift mine near Alleghany is being worked at a profit by W. A. Hanly and son. There is somewhat of a revival in prospecting around Alleghany. Keep your eye on that district. The Scotch company which has been operating on the ridge near Gibsonville for a couple of years past in prospecting for gravel will, it is said, soon begin the sinking of a double-compartment shaft. The shaft is to be put down 500 feet. The northern part of this county is all right. Drift mining is doing the business. The Alaska quartz mine at Pike City, which yielded $227,000 in 11 months, is lying idle. At the Tennessee drift claim near Poker Flat, owned by Thomas Corbett, two men are employed. This is one of the biggest paying little gravel mines in Northern Sierra. Brown, Hill and Jones also have a good-paying drift claim just over the hill northeast of the Tennessee. The Bunker Hill mine, east from Gibsonville, is running in full blast with a force of about 40 men employed. This mine is paying a handsome profit to its owners; superintendent, W. Metcalf; secretary, D. Boland. J. S. Gould, Lewis Ham and other parties have leased the tailings at the mine and are now engaged in working them. Work is still being pushed ahead at the Gibraltar drift mine. The Happy Hollow drift mine at Port Wine employs about 50 men and is paying well. This makes things livelier around Port Wine than it has been for years previous. There is also considerable prospecting going on there. The Riffle drift claim at Grass Flat is working about 30 men, and is returning comfortable dividends to its owners. John Fessler, who has a quartz claim on Kanaka creek, about a mile from Alleghany, is doing fairly well from all accounts. If reports are to be believed, he has, with the aid of one man and a hand mortar, taken out anywhere from $20,000 to $30,000 during the past couple of years. Frank Hauber is still carrying on developments at his quartz mine near Alleghany. T. H. Phillips and Thos. Murty are engaged in running ahead the lower tunnel, which is in a distance of 260 feet. Horace Brown is still prosecuting work at the Kentón quartz mine below Alleghany. He run the mill last winter and made some profitable cleanups. "Doc" Bowers of Alleghany is still engaged in prospecting his drift claim at Kimberlin ravine. Messrs. Moulton, Shaffer, Matherson, Benning, Fuller and Evans are operating the Hard Scrabble drift mine at Forest City. It is located on the o'd Bald Mountain ground. They are running a tunnel and taking out pay. Jas. McGregor and others are also working on the Bald Mountain ground. The owners of the South Fork gravel mine at Forest City are prosecuting developments and taking out pay gravel. H. A. Raymond is preparing for a good winter's work at the Seventy-Six drift mine. M. Harp and J. J. Thompson own the Sierra quartz claim. It is situated on Kanaka creek south of Alleghany. Last year they struck a rich bunch of ore and took out a neat little sum of money. They are now engaged in putting through a raise from the lower tunnel to the upper one in the hopes of striking more rich spots. The Ruby drift mine at Forest City continues to be a steady and reliable bullion-producer. Thirty-five men are employed. At the Wallace Consolidated drift claim the tunnel has been run 535 feet. H. M. Bradbury and Walter Lawry recently completed their contract of running 100 feet. The Arizona drift claim, situated on the ridge above Forest City, is not working at present, but the company expects to put on men soon to run ahead the lower tunnel, which is already in upward of 2000 feet.

A PROMISING MINE.—Sierra *Tribune*, Aug. 16: The South End is the name of a quartz mine located three years ago by W. G. Montgomery. It is about one-quarter of a mile south of the Red Chief claims. The upper tunnel is in 35 feet. In this tunnel the owner struck a rich bunch of ore last year. He pounded it up in a hand mortar and realized therefrom the neat little sum of $500. A lower tunnel has been run into the mountain a distance of 230 feet. The ledge in the adit measures 32 feet in width and shows fine prospects in free gold and sulphurets. The depth acquired on the vein by the lower tunnel is 100 feet.

THE MARIPOSA.—The above quartz mine was known in former years as the Sacramento. It is located south of Alleghany, on Kanaka creek. It is owned by Harrison Appel and Andrew Grant. There are three tunnels run on the vein at a distance of about 40 feet apart. No. 1 tunnel is run 210 feet. At a distance of 200 feet in this adit a rich bunch of ore was encountered a few months ago, which yielded the owners several thousand dollars. No. 2 tunnel is in 115 feet, while No. 3, or the upper tunnel, has been run 142. Mr. Appel is now engaged with one man in pushing ahead the lower and middle tunnels. It is his intention soon, however, to put a raise through between the tunnels. The vein is well defined.

NEW MILL.—*Mountain Messenger*, Aug. 17: The Garibaldi Co., at the lower end of Gold Valley, have their five-stamp mill almost completed. They have yet to build a long tramway.

BALD MOUNTAIN.—The Bald Mountain Ex. Co., Downieville, have levied an assessment of three cents a share. Bedrock is growing softer, and 32 feet was made last week, against 22 during the previous six days. The main tunnel is in near 3200 feet. E. B. Lacrue and Dan Reilly were up to the Horseshoe mine this week. Dan has taken a contract to run 80 feet of a crosscut, and John Erb will be his partner. Wm. Rowe and Chas. Beightol have leased the diggings of John Meyer, at Secret Canyon, and are making money.

GOOD GRAVEL.—Wednesday evening Charles Heintzen telegraphed from Forest City the good news that fine-looking gravel had been found in the Wallis Consolidated drift mine, a few miles above Forest City, a very convincing proof that a channel extends up the ridge through the Bald Mountain Extension and adjacent mining properties.

THE GOLD LAKE M. CO., situated between Gold Valley and Gold Lake, are pushing things ahead as fast as possible. They are putting up a mill and boarding-house, and have a large number of men at work.

Siskiyou.

PLACER AND HYDRAULIC.—Yreka *Journal*, Aug. 21: The miners at Oro Fino and vicinity have been unable to work their placer and hydraulic mines to any extent this season, on account of scarcity of water during the present unusual dry season, but expect to do well next season. Wright & Fletcher will no doubt take out a thousand dollars a day with sufficient water to work their giants, as their ground will pay a dollar to the bedrock foot, and they have a large extent of ground. The Eastlick Bros. also have good placer ground in same vicinity which will pay handsomely with an abundance of water. The quartz miners, however, are able to continue operations, but could do much better with more water. In Quartz valley, Hon. R. H. Campbell will take out an immense quantity of gold, if the coming winter will cover the Salmon mountains with a good supply of snow to feed his ditches next spring. The snowfalls last winter having all been exceedingly light, render a very short run this season. The quartz miners in this valley have sufficient water for their mills and are doing as well as usual. The miners on the Klamath say if the Klamath City dam people will just let the water of the river run steadily, they will cause no trouble, but to hold the water and let it go to raise the river six or eight inches, forces them to keep raising and lowering their water-wheels. When the river is lowered, the wheels stop until let down, and when the river is raised six or eight inches with the wheels lowered, they move too lively. At the Schroeder & Werner quartz mine, on Deadwood creek, new buildings are being constructed for the accommodation of the miners, at a cost of about $4000, and five more stamps are to be added to the mill to keep 60 men employed in getting out quartz and running the mill during the season of next year. This is one of the best-paying quartz mines in the county.

LONE STAR.—Yreka *Union*, Aug. 17: J. F. Boyle feels jubilant over the showing for a big thing for himself and others at the Lone Star mine, Humbug creek. He was in town Sunday and had with him a lump of gold, approximating in value $3000, which was the proceeds of the crushing out of about 40 tons of quartz at the McCook mill. The ledge from which this was taken gives every appearance of being a continuous one, and promises to pay the enterprising workers handsomely. Mr. B. says he has enough quartz out to keep the mill going for some weeks.

San Bernardino.

CALICO.—Cor. Los Angeles *Miner and Artisan*, Aug. 17: The King mine, which has such widespread notoriety, owing to the richness of its ores and the extent of the ore bodies, is almost in the town of Calico, lying on the flanks of a rugged red mountain immediately north of the city. After a period of idleness, pending the necessary repairs of their mill at Daggett, a full force of men was put to work the first of the month, and the heavily laden ore-wagons are hauling the rock to the mill.

THE ORIENTAL, which lies immediately in front of the King, is shipping ore regularly from the big bonanza opened some months ago. It seems to come up to the "great expectations" placed upon it some time since. The Oriental is the property of the Runover Company. They employ 25 men in the mine.

THE OCCIDENTAL, in East Calico, is working 25 men, shipping rich chloride rock from the new bonanza. The Occidental has been in bonanza now for about five years, and is one of the best properties on the coast.

THE WATERLOO.—The great mine of West Calico is booming along in good shape, having increased the force of miners recently, employing now 100 men. The output is about 200 tons every 24 hours.

THE ODESSA, belonging to the same company as the Occidental (the Runover), is shipping regularly. The output of the camp is now about 9000 tons a month.

CHLORIDERS.—Chloriders are at work in various parts of the camp, doing well. Some of them are taking out some very good ore.

San Diego.

HELVETIA.—Julian *Sentinel*, Aug. 15: The shaft at the end of the new tunnel in the Helvetia was commenced this week. It will be sunk to a depth of 200 feet as fast as men and money can do the work.

Trinity.

TRINITY CENTER.—*Journal*, Aug. 17: We visited Bloss & McClary's placer mine and found Mr. Bloss and his crew of men busy at work. They have a good supply of water and prospects are favorable for a good cleanup. The mine is undoubt-

edly among the largest in the county. The company also have splendid water rights, taking water from Swift creek.

NEVADA.

Washoe District.

CONFIDENCE-CHALLENGE.—Virginia *Enterprise*, Aug. 17: The joint Challenge Con. Imperial and Confidence west crosscut from the 500 north drift is in a distance of 27 feet, having been commenced since last report. The face shows a mixture of quartz and porphyry.

HALE & NORCROSS.—On the 500 level the upraise from the east crosscut was advanced 8 feet; total, 30. The top of this raise is still in good ore. Are putting square sets in preparatory to extracting ore when milling is resumed. Are still retimbering the main west drift on this level. Are retimbering the main shaft above the 1300 level, and have men on repairs wherever needed on the different levels.

BELCHER.—The 1300 raise has connected with the 1200 south drift and affords a fine circulation of air, coming up the raise and out of the incline. The connection just made by the Seg. Belcher & Midas Company with the Overman on the 1100 level is of great benefit to the Belcher, and materially augmented the circulation of air on this level.

OVERMAN.—Have extended the north drift from the winze 18 feet. Material, porphyry and quartz. Upraise from west drift is up 24 feet. Material, porphyry and quartz. At a point 63 feet above west crosscut No. 3 have drifted west 20 feet and extended the incline upraise 43 feet.

CHOLLAR.—The north lateral drift on the 750 level is out 400 feet; face in porphyry. The north lateral drift on the 850 level is out 67 feet; face in hard porphyry. The west crosscut 150 feet north of south line, 650 level, is out 65 feet, the last five feet in quartz giving low assays.

SEG. BELCHER.—Have connected the south drift from the 1100 crosscut with the Overman workings and obtained a fine circulation of air. Have started the 1000 south drift from the Belcher raise and are 23 feet in ore ground. The face is in vein material.

SAVAGE.—On the 500 level the west prospecting drift started in the north drift from the upraise was advanced 17 feet, its total length now being 45 feet. This drift passed through two feet of fair-grade ore, and the face is now in quartz and porphyry.

ALPHA.—The west crosscut on the south line, 382 level, is out 160 feet; face in quartz of no value. The west crosscut 60 feet from the shaft is out 500 feet. The west crosscut on the south line, 500 level, is out 217 feet; face in hard porphyry.

CROWN POINT.—Have completed the connection between the 1100 south drift and the Belcher north drift. Are running a southeast drift from the 500 level raise, 17 feet below the 400 level, and are out 45 feet in clay and porphyry.

JUSTICE.—The north and south winze, 60 feet below the 490 level, are yielding the usual amount of good ore. Shipped to the mill during the week 200 tons of ore; average battery samples, $21 29 per ton.

CON. IMPERIAL.—The north drift on the 1300 level is now in a distance of 362 feet from the south line, having been extended 22 feet during the week. The face still continues to show quartz and porphyry.

SILVER HILL.—Southeast drift, 160 level, at a point 630 feet distant, started a crosscut in a northwesterly direction and made a connection on the eighth level, giving a fine circulation of air there.

POTOSI.—Have been engaged the past week in retimbering the south drift on the 850 level. The east crosscut, 550 feet south of Chollar shaft, 950 level, is out 13 feet; face in clay and porphyry.

EXCHEQUER.—On the 350 level the west crosscut 150 feet south of the north line is out 190 feet; face in porphyry. The west crosscut on the north line, 500 level, is out 18 feet; face in porphyry.

BALTIMORE.—The usual progress is making in the drifts and crosscuts on the 338 and 225 levels. At several points on these levels, deposits of good milling ore have been developed.

SCORPION.—On the 500 level the new east drift from the Sierra Nevada shaft is advanced 1045 feet. There is no change to report in the character of the ground.

ANDES.—Are running a drift from the winze 40 feet below the 350 level, and have started a drift from the 350 level to above the 313 level.

YELLOW JACKET.—Are shipping about 50 tons of ore daily to the Brunswick mill and prospecting the upper levels of the mine.

EAST SIERRA NEVADA.—On the 520 level the new east drift from the Sierra Nevada shaft is advanced 1045 feet.

WARD COMBINATION SHAFT.—The shaft has been repaired and is now in good condition down to the 1500 level.

NEW YORK.—The upraise in the west crosscut on the 800 level is up four feet, the roof yielding fair assays.

ALTA.—Mill in full operation and 925 level stopes yielding the same quantity and quality of ore.

Cherry Creek District.

EXCHEQUER.—White Pine *News*, Aug. 17: We learn that Salt Lake men are in Cherry Creek experting on the old Exchequer mine with a view to purchasing. The Exchequer's past record is certainly an inducement to capitalists to go below the water line.

Comet District.

BONDED.—*Silver State*, Aug. 17: E. A. Shear has bonded the Old Comet mine, and will make an effort to interest Salt Lake or other parties in the property. There is an excellent showing of low-grade ore in the mine, which the building of the proposed railroad will make it profitable from the start to extract. So far it has possessed no value on account of the expense attached to marketing it.

Seligman District.

INACTIVE.—White Pine *News*, Aug. 17: Eugene Howell, who has just returned from Seligman district, thinks nothing will be done there until all matters pertaining to the estate of the late Mr. Robinson are wound up.

Flowery District.

PROSPECTING.—Virginia *Chronicle*, Aug. 20: This morning two miners left for Flowery district to prospect in the vicinity of the Golden Prize location. They were equipped with a three months' supply of commissary stores. There are numerous small veins of gold-bearing quartz in the district that have added above a million to the wealth of the State, and as that district is fertile in mineral the prospectors are confident that they can make fair wages. A pocket struck in the Golden Prize in 1866 yielded $40,000 in gold bullion, and the space from which it was taken did not exceed 20 cubic feet.

Jumbo District.

NOT HIGH GRADE.—Virginia *Chronicle*, Aug. 20: The reports from Jumbo district are not so rose-colored as heretofore. The Dunlop five-stamp mill is not yet completed—in fact, the work of construction is suspended, for the reason that the ore now on the Wild Goose mine dump is not high enough in grade to warrant the expenditure necessary to get a supply of water for amalgamating purposes. There is water in the shaft at the mine, but it will require an expensive pumping plant to lift it to the surface, and to tap it by an adit tunnel would require cutting a length of above 3000 feet.

Tuscarora District.

BELLE ISLE.—*Times-Review*, Aug. 17: West crosscut from the end of north drift, 250-foot level, extended 16 feet.

COMMONWEALTH.—The mine is showing well at every point. One hundred and sixteen tons of ore sent to the mill; average battery assay, $198.97. As a test, 500 tons concentrating ore have been sent to Grand Prize plant; the results obtained give satisfaction, showing that the low-grade ore can be concentrated to a high percentage. Bullion shipped during the week, $21,292.76. Crude bullion on hand, $12,000. Under instructions from the board of directors, the work of extracting ore has been suspended.

DEL MONTE.—North drift, 225-foot level, extended 15 feet. Joint crosscut, 225-foot level, extended 14 feet, the face having entered the vein, which is looking remarkably well and shows the ore to be of high grade; face still in ore. East crosscut No. 1 north, 100-foot level, extended 13 feet. The face is in very high-grade ore.

NORTH COMMONWEALTH.—Joint crosscut, 225-foot level, just entering the vein, having thus far cut into a foot of good ore, much of it being high grade. Face still in ore. East crosscut No. 1 south, on the 100-foot level, extended 15 feet; total length, 202 feet. The face is still in low-grade ore.

NEVADA QUEEN.—South drift from Commonwealth, 150-foot level, has been advanced 9 feet with but little change. All work has been suspended, pending the sinking of the North Belle Isle shaft, which will open up the 550 and 650-foot levels.

GRAND PRIZE.—400-foot level: West drift, old vein, extended 23 feet. West drift from north crosscut extended 20 feet, and west crosscut from south drift extended 11 feet. Pump is running steadily and doing good work.

NAVAJO.—South drift, west, 350-foot level, extended 12 feet. Crosscut from south drift east, 350-foot level, extended 17 feet. No. 1 upraise south end, same level, extended 6 feet. The ore continues high grade.

NORTH BELLE ISLE.—The shaft has been sunk and timbered 15 feet. The rock is a little harder in the bottom. The flow of water shows a slight increase.

ARIZONA.

NOTES.—*Journal-Miner*, Aug. 15: "Bob" Dougherty has gone out to the Bradshaw mountains to start work on the Eclipse again. Eight new concentrators have been received at the Vulture, and will be used in working over tailings from the mill. Sidney J. Cook came in Friday evening from Maple gulch, where he has been engaged in mining and milling ores, with good success, he says. He has been compelled to close down, on account of lack of water. Jacob Henkle has his tunnel on the Rapid Transit mine in on the ledge for a distance of 300 feet. The ledge is a very strong one and the ore exceptionally rich. C. M. Clark has a number of men engaged in putting the Dixie mill in readiness for a run. A sufficient quantity of ore is now on the dump to start the mill up as soon as a sufficient quantity of water supply is obtained. We understand that Tom Brown, formerly superintendent of the Tip Top mines, is to fill a similar position under the new management at Harqua Hala. A corporation is about to be formed to work a mica mine in this county. The Kansas City M. and M. Co. has let the contract to sink a 100-foot shaft on the Julia mine on Groom creek. This is one of the Rubert group. Assays were made yesterday of a lot of ore from the Occident mine, which showed a value of 15,000 ounces of silver per ton. The ore is from a new strike in the mine, made about a week ago. When the ore was first struck it was very narrow, but in going nine feet has widened out to four inches. The ledge is a parallel vein to the Peck, or by many considered to be a part of the same vein.

ORE SHIPPED.—Mohave *Miner*, Aug. 17: Frank L. Smith shipped four carloads of ore to the Rio Grande smelter this week. N. C. Amer is making a shipment of ore from the Silver King to the Rio Grande smelting works this week. The Flores mill is now running on ore from their mine, and arrangements are being made to put up a hoist, as the working is now so deep as to require one. Dan McKinnon and Barney McCall have commenced work on the Altatta, and expect to make a shipment ere long. The Empire mine in Chloride is reported as taking out some of the finest ore ever taken out in the county. There are a good many tons of the same kind of ore still in sight. At the sampling works the following lots were worked during the week: N. C. Amer, small lot of high-grade ore; W. W. Clack, three tons from C. O. D.; Robinson & Harris and Opie & Martin, lessees on C. O. D.; each had small lots worked, all high grade. The weather has been so warm during the past month that the prospectors and miners are doing only what work they are compelled to do. With the cool weather, which it now seems has set in, work will be again fully resumed.

COLORADO.

CONEJOS CAMP.—Denver *Republican*, Aug. 15: J. D. McCarthy, a well-known mine-owner and promoter, has just returned from what is generally known as Conejos Camp, a few miles up in the mountains from Alamosa. From the reports he brings to the city, this district is destined to play an important part in the total production of the State in precious metals in a few years. He says that the Mammoth mine, a property in which he is interested, has a carload of ore on the way to Denver which, according to samples made, will average close on to $600 per ton, and before the month is over 20 more tons will have been mined and settled for. While at Carson Camp Mr. McCarthy bought the Holy Moses and Lone Hand locations. The Merrimac M. Co. is doing considerable work in this district, the results of which are so far most satisfactory to the management. The Ute mining district, in which all these claims are located, is a region which it will pay intending buyers and promoters to watch with care. The ore found is of an exceedingly high grade, and seems to occur in sufficient quantities to make it highly profitable.

DAKOTA.

IRON HILL.—Black Hills *Pioneer*, Aug. 15: Contractor Damon has finished burning 52,000 of the 100,000 brick he agreed to furnish the Iron Hill Mining Company at Carbonate. The others are in the kiln now, and will be delivered as soon as practicable. The smelter continues running smoothly and satisfactorily.

SOPHY LODE.—Oscar Waller came in from Carbonate yesterday, where he has just completed assessment work on the Sophy, lying east of and close to the Spanish R. The property belongs to Waller and Hann. Work just completed served to disclose a ledge of very good ore.

PLUMA MILL.—The Pluma mill is still pounding away on ore from the Big Missouri mine. Run on this ore will probably continue through the month.

IDAHO.

THE HOPE CLAIM.—Wood River *Times*, Aug. 17: After five months of indefatigable efforts and under very discouraging circumstances, Delius & Thompson have at last struck it rich in their lower tunnel, which is driven to a depth of 475 feet from the surface. They cut into the vein three or four days ago, and have found it to be 17 feet 6 inches from wall to wall and all ore. The ore is of two classes, free and concentrating The concentrations, ten tons in one, assay from $125 to $1000 per ton. The free ore assays from $15 to $30, on an average, but some of it goes $200 and over. Thirty tons of the ore run through at the Deer Creek mill, two months ago, yielded an average of $17 per ton. The Hope claim is located in Croesus gulch about two miles west of Hailey.

IDAHO.—*Statesman*, Aug. 15: The Idaho G. M. & M. Co. has been recently organized in Boston. The object of this company is to develop some gold quartz in the Leesburg district, Lemhi county. Charles F. Blackburn is the superintendent and general manager of the mines. The other officers are prominent business men in Boston. The company is capitalized at $300,000—30,000 shares at a par value of $10 each; stock non-assessable. One-third, or 10,000 shares of the capital stock, is being sold in Boston for working capital to develop the mines. Mr. Blackburn hopes to begin work in the near future, and is confident of making a bonanza out of these gold ledges.

BUFFALO.—Idaho *World*, Aug. 17: Harry Smith has made a piece of road from the old Buffalo mine to connect with the main road to Morrell's mill, in Lewis' gulch. The Buffalo was worked many years ago, but no ore from it was ever milled. There is a pile of ore on the dump—one hundred tons or thereabouts—that Smith has had assayed and believes will pay. He will soon have some of it crushed. The Buffalo is at the head of Wet Gulch.

CROWN POINT.—Work will soon begin in the tunnel on the west extension of the Crown Point mine, at Banner. This claim is owned by J. C. Fox, Ritchie Bros., Dunc Ferguson and others. The tunnel is in 280 feet, and is not more than 40 feet from the ledge. Work will be pushed ahead to tap the vein. The ore of this location prospects well at the surface.

A STRIKE.—*Idaho Recorder*, Aug. 15: A strike was recently made in the lower tunnel of the Kentuck mine at Shoup, disclosing a larger body of ore than ever seen before in even this famous producer of the yellow metal.

LOWER CALIFORNIA.

A TEN-STAMP MILL.—*Lower Californian*, Aug. 15: Capt. W. M. Baines arrived from San Diego Tuesday morning after an absence of several weeks, during which time he made a trip to St. Louis and Chicago. In the latter city he purchased a ten-stamp mill with 850-pound stamps, and fitted with all the modern improvements for saving flour gold; also a Blake crusher and an automatic feeder. The machinery was purchased from Frazer & Chalmers. All the machinery is being freighted via Tia Juana, and the mill as laid down at the mines will cost not less than $20,000. The El Paso Mining Co. owns four mines at Alamo—the Texas, El Paso, Annie and Avalina. They are generally conceded to be among the richest in the district. Recent developments in the Annie, which lies between the International Co.'s Iron Mask and Iron Vein, have attracted much attention and placed it in the first rank. The mill will be running in full blast on the company's mines within 25 days, turning out three tons a day per stamp. No custom milling will be done.

MONTANA.

AT ARGENTA.—*Inter-Mountain*, Aug. 15: Alex. B. Allen, secretary of the P. J. Kelley Quartz and Placer Mining Company of Argenta, reports his company progressing rapidly with its operations on Rattlesnake creek near Argenta. A 60-ton smelter has been purchased of Fraser & Chalmers of Salt Lake City, and the company expects to have it in operation by the first of September. Next spring they calculate to add two more smelters of 60 tons capacity each, to the plant, thereby making their reduction capacity 120 tons per day. Mr. Allen states that development has been pushed on the properties, and that sufficient ore is now in sight to run works of the above-mentioned capacity for five years. Development work has also been pushed on the company's placer ground, and it will be in shape to be worked extensively next spring. The scarcity of water has delayed the placer operations considerably, but the company expects to get about a month's washing yet this fall. The Clark smelter at Argenta Mr. Allen reports in full operation and working successfully. The entire camp is lively, and new discoveries are being constantly reported. The ore is silver-lead carbonates, high grade, and easy to treat, requiring no fluxing. Mr. Allen thinks Argenta has a bright future before it.

NEW MEXICO.

AZTEC.—Sierra City *Enterprise*, Aug. 16: The Aztec company is laying a pipe to connect its mill with the water works. It was thought at first that the wells sunk near the mill would furnish a sufficient supply, but it has been found inadequate during the dry season. John M. Wright is running a tunnel in on the Mountain View lead of the Santo Domingo claim. The tunnel is several hundred feet from the shaft of the Mountain View from which the rich ore has been taken, but the vein is the same. Utter & Lewis have commenced running a tunnel in on the Grand Tower at Gold Hill. What Gold Hill needs now is a good custom-mill. Hank Dorsey is in from the Greenlee district near Clifton, bringing a bottle full of coarse gold washed from some of his mines. The dirt paid at the rate of $1 per pan, but Mr. Dorsey was compelled to carry dirt more than a mile on his back to water. Hank is satisfied that the placers will yield a large amount of money, but it will require the investment of some capital to make it profitable. On Wednesday Miller Bros. & Dodd, owners of the Alhambra, made the richest shipment of ore ever made from this city. One thousand pounds were sent by express, which it is expected will average $10 per pound, and three tons were sent by freight, which will probably run from $1000 to $1500 per ton. A large per cent of the ore sent by express is over one-half pure silver, while some specimens could be picked out containing almost as much pure silver as a coined dollar. The traction engine, which will soon be put to work hauling ore for the Pacific and Aztec companies, arrived on Monday.

PINOS ALTOS DISTRICT.—*Southwest Sentinel*, Aug. 13: The Mountain Key belongs to the Pacific or Aztec group. Ninety men are employed here on the second, third and fourth levels, under the direction of Supt. John Boyle Jr., and Capt. Pritchard. The Mountain Key vein carries a width of from 6 to 15 inches from second to fourth levels, and gives evidence of widening as it descends. Indeed the miners will not feel at all surprised if in the fifth level, which will shortly be started, the vein attains a width of fully 20 inches. The spreading out of the deposit in its downward course does not decrease the value of the ore as is the fact at some mines visited, but on the contrary in the case of the Mountain Key the product becomes much richer. The Co.'s mill on Bear creek, near by, is kept running steadily on the product of the mine.

THE AZTEC MINE.—This is situated on what at first appears to be the Mountain Key vein, owing first to the striking similarity of the formation, and secondly, to the course of the lead at its mountain base. The fourth level has been reached, where work is principally confined at present on three parallel veins, which we will designate as Nos. 1, 2 and 3. No. 1 averages about eight inches in width, carries sulphurets of iron lead and zinc, and is formed in granite. No. 2 courses 56 feet west of No. 1, is slightly larger, and formed in hard granitic syanite, though in chutes of ore; in this there is a casing of soft slate which makes mining easy. The formation of No. 3 is identical with No. 2, where the vein is yet larger and the ore of a higher grade, and also contains chutes of soft mineralized slate. Capt. J. S. Tonkins is in charge and handles the workings, in which 60 men are employed, in an intelligent manner.

SUSPENSION.—The Night Bird will be started up this week. In accordance with instructions from the St. Louis people, work was entirely suspended at the Thunderbolt property on last Friday evening. The shaft had reached a depth of 100 feet, the small lead grew no larger, water became more troublesome, and thus a total suspension of operations was ordered. The men employed here have gone to work on the Smith & Ailman property.

OREGON.

CRACKER CITY.—Baker City *Democrat*, Aug. 14: Our reporter visited the scene of operations of the Eureka & Excelsior Mining Co., about one-half mile above the town, and was shown, first, through the tunnel of the Excelsior, a distance of 700 feet. Starting at the entrance of the tunnel, one continuous vein of ore is followed the entire distance, the ledge at its narrowest place being 18 inches and that for only a short distance, and from that up to 12 feet wide, showing rich black sulphurets and assayed every ten feet the entire distance of the tunnel. About 500 feet in the tunnel of the Excelsior is an upraise to the surface a distance of 250 feet as straight as an arrow following the ore vein the entire distance. In the crosscuts in several places the vein is exposed 12 feet in width between walls, and in the face of the tunnel a ledge six feet in width is found of the richest sulphurets. The same may be said of the Eureka, on the opposite side of the creek. The tunnel is in over 600 feet, and the same immense bodies of ore are to be found. There is no doubt but that the company will be compelled to add another 20 stamps more to their mill plant before many days after its completion. Until the reporter's visit to the scene of operations of the E. & E. Gold Mining Co., he had only a faint idea of what was really transpiring there, and the extent of the company's work cannot be realized by any one save by witnessing it. It is simply wonderful. There, between two almost perpendicular mountains, rising thousands of feet above the level of the sea, thickly timbered, is where the large mill plant is to be erected. Upward of 150 men are employed on the work, and it is progressing rapidly. The expense attending the company's work must necessarily be enormous, their pay-roll reaching in the neighborhood of $16,000 per month, but they are fully justified in the outlay; and as soon as their mill is completed, which is expected to be not later than December, it will be kept pounding on ore indefinitely.

MECHANICAL PROGRESS.

Nail Manufacture.

The introduction of the wire nail has been the cause of much disturbance and a great falling off in cut-nail manufacture. This falling off has been due in a large measure to several most unbusiness-like mistakes on the part of the cut-nail manufacturers. In the first place, the disagreements between the cut-nail manufacturers and their workmen in 1885 was a short-sighted policy at that time, as it afforded just the opportunity for the introduction and sale of wire nails—a product which for several years previously had been striving to gain a foothold in the market, but without success, until their rivals kindly closed the doors of the cut-nail manufactories for a period of nearly one year. The opportunity was quickly seized and the sales of wire nails rose from a few hundred thousand kegs in 1884 to 1,500,000 kegs in 1888. This result was brought about all the more readily from the fact that wire nails to do the same work were from 20 to 25 per cent lighter than cut nails. Moreover, during the lock-out the manufacturers largely increased the number of their machines.

Other Mistakes

Moreover, just about this time they were changing from iron (the weaker metal) to steel (the stronger one). Common sense would seem to have suggested the very practicable idea of reducing the weight of the nail proportionately to the improvement in the metal, and thereby have wiped out the difference in weight between the cut and wire nail. This would have been business-like and in the way of true progress. The benefit derived from the greater number to the pound would have more than offset the naturally slight increase of cost in making the lighter nail and cheapened the product to the consumer.

Coming to Their Senses.

But recently, after several years of waiting, the manufacturers are coming to their senses, as we learn from a Pittsburg journal, which says: "At a recent meeting held at Wheeling, the Western Cut Nail Association, by a formal vote, decided to reduce the size of the cut nail, in order to make it weigh as near the number per pound of the wire nail as practicable without impairing its effectiveness or diminishing its holding qualities. Specimens were sent by six different wire-nail factories and the association made up their estimates by actual weight."

This step has been taken to make headway against the rapid encroachments of the wire nail. Steel nails in future will be practically cut the same gauge as wire nails, so that they shall count as many to the pound, and thus, it is hoped, take away the chief argument of the wire nail. It is felt to be a last resort, and the die is cast for the steel nail to stop further incursions of its enemy, or else its own doom is sealed.

It is not difficult, says another cotemporary, to foresee several effects which must result from this policy. One will be the necessity of raising the base price, in consequence of the increased cost in cutting, and also a revision of extras. This last has been set for consideration at a special meeting on July 24th. Whether the adoption of new gauges will be universal, and whether the new nails will give satisfaction, will have to be tested by time. Meanwhile it is interesting to contrast the attitude of the two classes of manufacturers. The wire-nail men are calmly confident, pursuing their way without any regard for their adversaries or their doings, and hopeful for the future. On the other hand, the steel-nail men are full of anxiety for what is to come, and devising one expedient after another to restore their lost supremacy.

If the manufacturers had convened en masse, and formally resolved to ruin their business, they could hardly have devised a policy which would have been more effectual for their purpose than that which has been pursued. The action of the cut-nail manufacturers must be regarded as most unwise. In their contests with their workmen they fairly overreached themselves, and to the cost of both the employer and employed. Employers must deal fairly with the employed. This is one of the essentials which mark the advance of modern progress. Their failure to take a plainly obvious step to cheapen the cost of their goods to the people without cost to themselves or their employes, was unwise and unbusiness-like. And now that they appear to have become aware of their mistakes in the past, it behooves them to act promptly in adjusting themselves to the new conditions of the nail industry, and thus place themselves in the line of true progress.

A New Nail Machine.

In connection with the above we would call attention to a new nail machine which has recently been perfected, and which is warranted to make at half speed, 12,000 nails a minute, or three tons per diem. The inventor is a New Englander, and the process is said to be of the simplest description. Instead of the ordinary shear-like cutters heretofore employed, the latter consists of small sheet dies imbedded in two narrow cylindrical rollers, having the appearance of cogged wheels. The strips of iron or steel being fed between the rollers and the dies or cogs, cutting the nails at the rate above. Movable steel teeth placed between the cogs are forced toward the center of the cylinder, to the point of contact with the dies, and in the course of the revolution come in contact with a steel shaft which pushes them upward, and forces the nails from between the cutters, whence they drop into a spout or conductor. Another feature is that by means of a single leverage system of inclined planes acted on by screws, the cylinders can be adjusted in their relations to each other to the ten thousandth part of an inch. The dies are replacable, and can be ground without being removed from the cylinder.

IMPROVED METALLIC PROCESS.—By a new and interesting process zinc is now applied to iron in such a manner as to prevent liability of the zinc becoming detached, besides imparting to the metal the property of taking a polish or being galvanized with any desired metallic coloring. In accomplishing this result the iron is first cleaned by being subjected to the action of a mordant, after which it is drawn through a solution of chloride of zinc, a little ammonia is thrown upon it and it is immersed in the zinc bath. The apparatus for this purpose is placed near the heating appliance, being so constructed that two rotating cylinder brushes are placed over the vessel containing the zinc, and can be brought nearer to or removed from each other in a horizontal position, even during their rotation. When the iron plate is to be placed in the zinc bath, the brushes are moved sufficiently far apart to allow of this being easily done. The iron remains in the bath until it has assumed the temperature of the contents; the metal is then lifted out of the bath sufficiently for its upper portion to reach the middle of the steel cylindrical brushes, which are put into rotary motion by the mechanism, and are brought so near each other that both sides of the metal are subjected to their action. Their velocity is regulated by their distance from the surface of the zinc bath and by the thickness of the metal to be treated. The superfluous zinc is removed by the brushes while in a soft condition, so that only the clean zinc alloyed layer is visible after the operation. This layer is not a coating of zinc, but is the original surface of the iron, and therefore inseparable from it. Not only does it perfectly resist all influences of temperature, but it can be heated without injuring the layer of iron and zinc alloy.—*Ohio Valley Manufacturer.*

A BAND SAW FOR METALS.—English machine shops make use of a tool which is but little used in America. It is a band saw for metals. Its construction is similar to that of a heavy band saw, with a third carrying wheel for the saw, the object of which is to remove the upmoving side of the blade from the vicinity of the table, and thus leave a deep throat through which a large piece of work can be passed or a wide plate turned. This third wheel is placed at the back of the machine, about midway in the vertical hight of the saw blade. The temper of the saw is slightly harder than that of those used for wood. The teeth are sharpened straight across the blade by a cutter, with its teeth at the right hight to suit the teeth of the saw blade. This tool is used to cut off the spines from steel castings, the ends of bolts, to saw up steel, iron and copper plates to any form, and to rough out the jaws of eccentric rods and other forgings which would require the use of slotting machines. It cuts as well on a circle as upon a straight line. The blade is lubricated with soap and water, and in a cut six inches long through a steel connecting-rod jaw it works freely and satisfactorily. Not infrequently circular saws of large dimensions are used for the same purpose, and, being mounted on heavy frames and fed carefully up to their work, cut off large pieces of steel, leaving nearly a smooth surface on the face of the cut. A saw similar to the above is now in operation at the shops of the Yale & Towne Manufacturing Company at Stamford, Conn.

SOUTHERN IRON.—There are, at the present time, about 25 furnaces in full blast in Alabama, turning out pig iron from $3 to $4 a ton cheaper than it can be turned out in Pennsylvania. Although the Southern iron men are not trying to undermine or break down those of the North, and don't expect to do anything of the kind, still they are receiving large orders from the North and nearly all other parts of the Union. The South has its advantage of cheaper labor, abundant, excellent and convenient ore; but the North has a big advantage in the way of markets, and there is room for both in the field. The whole number of furnaces in blast in the entire Union is about 290. There are 24 States in the Union which produce pig iron. The Southern iron-producing States are Maryland, Virginia, Alabama, West Virginia, Tennessee, Kentucky, Missouri, North Carolina, Georgia and Texas.

THE COST OF FUEL per locomotive per year on the Pennsylvania system may be taken in round numbers at $2000. Fifteen per cent of this—the saving claimed in a paper recently read before the Institution of Civil Engineers for the compound system—is $300, a sum, the *Railroad and Engineering Journal* says, which it would be very easy to absorb in the maintenance of additional or more complex parts, or by the loss of service of the engine.

IRON CASTINGS 100 years ago sold for $110 to $150 per ton, pig iron for $152 per ton, and sheet iron for $300 per ton; nail rods were worth $165 per ton, and nails were worth from 16 to 19 cents per pound.

SCIENTIFIC PROGRESS.

Novel Experiments on Light and Electricity.

The following interesting record is from the London *Electrician:* "An experiment described by M. J. Borgman has an important bearing upon the explanation of the remarkable discovery of M. Hallwachs, in which a beam of light seems to act as a conductor for an electric current. The latter experiment consisted in placing a piece of metallic gauze parallel with, but insulated from, a second sheet of metal. The first is connected with the positive, the second with the negative, pole of a battery, and in one of the leads a delicate galvanometer is placed. If, now, a beam of light be made to pass through the gauze, and to fall on the plate behind, a current is set up in the circuit, and continues to flow as long as the illumination is maintained. It has, moreover, been shown that the action is due to the ultra-violet waves. Now, M. Borgman wanted to ascertain whether or not the effect was instantaneous; that is to say, whether the commencement and cessation of the current was or was not simultaneous with that of the illumination. M. Borgman probably reasoned that, if the beam acted in some sense as a conductor of the current, the effect must be instantaneous; while if the phenomenon resulted from some secondary action, it would probably go on increasing up to a certain point with the duration of the illumination, and it would also probably continue for a time after the light had been cut off. His method of making the test was equally simple and ingenious. The light was interrupted at rapid intervals by means of a rotating disk with holes or slits, and he placed a telephone in circuit with the battery. It is, then, obvious that, if the effect is instantaneous, the telephone will produce a note corresponding in pitch to the velocity of the disk; if otherwise, there will be silence. There was silence. A make and break in any other part of the circuit could be heard, but not in the beam of light; hence we must seek for some secondary action on the surface of the plates to explain M. Hallwach's experiments."

ELECTRO-MAGNETIC DISTURBANCES have occurred simultaneously with certain sun disturbances observed through the telescope. Evidently the electro-magnetic force traveled from the sun to the earth with the velocity of light. Twenty years ago Clerk Maxwell asserted that light was an electro-magnetic wave movement. Following out Clerk Maxwell's suggestion, an interesting series of experiments have recently been made by Prof. Hertz of Brown University, which show that electro-dynamic force is, like light, a wave motion, propagated through ether, and, like light, subject to reflection, refraction, and concentration by means of lenses. Prof. Hertz's experiments were based on the variations of an induction current at various distances from a metal wall, reflecting the primary current; based in fact on the well-known phenomena of wave interference, and they show the length of an electro-dynamic ether wave to be 1 72 m., its velocity through space to be 300,000 m. per second, or identical with that of light. By means of a metal reflector, electro-dynamic waves were focused, some substances, such as wood, being transparent, others, such as metal, being opaque, and casting electro-dynamic shadows. A huge prism of tar, weighing 1200 pounds, showed that the laws of refraction are analogous to those of light. Almost infinitesimally short vibrations of ether manifest themselves to us as chemical action, longer ones as light, still longer waves as heat, and these very long waves as electro-dynamic force. Electro-dynamic force is the low and fundamental base of which light and heat and chemical action are the high treble. Gravitation and other mysterious forces may yet be shown to be wave lengths in the middle register. Practical applications will undoubtedly be made of this new control over electro-dynamic forces possibly as important as those of the telescope, microscope, and spectroscope over light.

LONG RANGE TELEPHONING.—During the recent civic and military processions in New York, the music of the bands, the ringing of the church bells and the whistles of the steamboats were heard by a lady in Philadelphia. This may seem almost incredible, but we have it on good authority that this actually occurred. The lady in question takes press news over the long-distance telephone, and, in order to facilitate matters and aid her in hearing distinctly the dictation of the news-sender at the other end, she wears a metal cap, attached to which is a receiver that passes close to her left ear. Monday, during the naval pageant that welcomed the arrival of the President, she distinctly heard the whistles of the steam craft, the roar of the artillery, and the chimes of Trinity bells. Tuesday, during the progress of the military procession, strains of music from the various bands and the shouts and hurrahs of the witnessing crowds were plainly borne to her ears.

INCREASE OF TRACTION BY THE ELECTRIC CURRENT.—It has been a matter to some extent in dispute whether or not the passage of an electric current between the wheels of a motor and the rails, increases the adhesion available for traction. In a recent issue of *Electric Power* is a brief account of a demonstration recently made in Washington. The experiment was conducted by Mr. Joseph Lyons. A pair of wooden strips were connected to form a frame, and a pair of short parallel strips of sheet iron, set up edgewise, secured to the frame, and a toy electric motor was arranged to move the miniature truck along the sheet-iron rails. The experiment consisted in closing the motor circuit, and then lifting the forward end of the frame until the grade was such that the motor could not climb it, that is, until the adhesion due to the weight of the motor was not sufficient to overcome gravity. On closing an independent circuit through the rails and truck-wheels and shaft, the motor would start again up grade and travel a considerable distance. There was no mistaking the action of the motor. It was positive and pronounced, "like the scramble of an army mule," under the traditional stimulus. Mr. Lyons estimated the increase of traction at about 40 per cent.

CONVERTING INORGANIC INTO ORGANIC SUBSTANCES.—To say that iron can be converted into food sounds like nonsense. To say that the constituents of food can be extracted from iron, and the iron be thereby made more valuable than before, sounds like greater nonsense still. But Mr. A. B. Griffiths, in a recently published treatise on manures, tells us that both these things are so. The process of converting iron into Bessemer steel, Mr. Griffiths says, results in the elimination of a basic slag, containing from 14 to 20 per cent of phosphoric acid. Reduced to an impalpable powder, this slag forms a valuable manure, being readily assimilated by plants. He tells us that about 350,000 tons of this slag are annually produced at the various Bessemer converting establishments in England, and that its use as manure would produce at least 4,000,000 tons of hay, or sufficient for the feeding of 750,000 head of cattle. What a lot of things kindly Nature would do for us, if we would only let her have the chance. It's a rich storehouse we have at our command, if only we had sense enough to throw the doors open.

ESTIMATING COPPER ELECTROLYTICALLY.—In estimating copper electrolytically, Herr F. Rudorff says: "It is advantageous to acidify the solution with nitric acid; but when chlorides are present considerable time is taken up in evaporating the solution with sulphuric acid." He found that when an ammoniacal copper solution is electrolyzed the metal separates in a spongy condition, but that if two to three grammes of ammonia or potassium nitrate be added, and then about 10 cc. of ammonia for every 100 cc. of the solution containing 0.1—0.3 grammes of metal, the latter separates in excellent condition, even when the strength of current employed varies between considerable limits. The operation is ended when the solution has become colorless.

MANNESMANN STEEL-TUBE PROCESS.—The Mannesmann process of manufacturing steel tubes by rolling is now pretty well known in this country, and by it it is easy to form a cylinder closed at both ends, in which case the interior of the tube, on cutting into it, is found to be full of some gas. This gas has recently been analyzed, with the result that it was found to consist of 99 per cent of hydrogen and one per cent of nitrogen. The steel which was made was found to have the following composition in parts per 100: Carbon, 46; silicon, 25; phosphorus, 0.22; sulphur, 0.1; manganese, 23; with traces of copper.

PECULIARITIES OF VISION IN INSECTS.—A correspondent to *Le Naturaliste*, referring to the curious fact that neither flies nor wasps will venture to pass through a window across which a piece of fish-net is stretched, asserts that the phenomenon is due to the confused vision possessed by insects. The threads of the net give them the impression of a continuous surface, just as with us do the hatchings of an engraving that we look at from a distance. The animal believes itself to be in front of a more or less translucent obstacle, but one in which it distinguishes no orifices.

WHEN THE DEAF CAN HEAR.—It has been discovered that a man severely afflicted with deafness can hear when riding in a rumbling car. The philosophy of the phenomenon has been stated by an aurist as follows: "It is due to the counteraction of the noisy motion on the drum of the ear. The rumble of the heavy wheel on the track causes the drum to vibrate, and the afflicted one can hear quite plainly. Some people think that they ought to voluntarily raise their voices in a car. That is not so. Always speak in a low voice to a deaf person in a moving car or vehicle."

MANGANESE has a high melting point, but fuses when exposed to the heat of a good wind-furnace. It has a strong attraction for oxygen, and will even take it from the water at a low temperature. A variety of bronze containing manganese is highly esteemed.

MEDICAL SCIENCE has of late made no more important discovery than that consumption is not an inherited disease, but may be transferred by means of a germ or microbe from the sick to the healthy.

SPECTRUM ANALYSIS.—The oxygen band in the spectrum of the electric light from the Effel Tower was, at a point five miles distant, found to be similar to that in the sun's rays.

Good Health.

Health of the State for July.

It appears from the report of the State Board of Health for July that that month shows the smallest death rate of the year. Reports from 100 cities and towns, with an estimated population of 803,550, give the number of deaths as 897, which is a percentage of 1.11 per 1000 in the month, or an annual mortality of 13.32. It indicates an entire absence of epidemic disease of a fatal character, and a general condition of healthfulness throughout the State, which speaks louder than words.

Reports received indicate a remarkable absence of zymotic diseases. All observers agree that a general mildness of type characterized the sickness which had come under their notice, which will, perhaps, in a measure account for the limited mortality recorded during the month. As might be expected, the most prevalent of all disorders of the system were those affecting the stomach and bowels, and this was particularly noticed during and after the very warm days that were experienced in the earlier and latter part of the month.

Consumption, which enters so largely into our mortality returns, was fatal in 129 cases, which is below the monthly average. Pneumonia had a mortality of 38, of which number 23 occurred in San Francisco.

Cancer, in regard to which so little attention is paid by the medical faculty, shows a mortality of 21, ten of which occurred in this city. This malady still holds its place as the fifth on the list of fatal diseases. Typhoid fever is reported to have caused 29 deaths—a slight decrease from the June report. As this is the season of the year, says the report, when typhoid fever is most likely to prevail, and thereby increase the chances of the contamination of our drinking water, and as it is also at this time that visitors leave the warm valleys to seek health and recreation at the various mountain and seaside resorts, we cannot too earnestly advise such sojourners to criticise keenly the sanitary surroundings of the place in which they propose to spend their summer holiday; examine the outhouses and privies; see where the sewage is conveyed and deposited; note the proximity of the closets to the well, and if the well is a dug one, and within 300 feet of the sewer, cesspool or privy, do not drink the water from such well except you know it to be boiled. In short, avoid all summer resorts where cleanliness and sanitation is not the rule, where every outhouse, privy and cesspool is not deodorized and disinfected as regularly as the week comes round. Without this, danger is ever present, and we firmly believe that more typhoid fever is contracted in these insalubrious country houses, whose portals we seek for health, than the public is aware of. The frequent proximity of cow-yards, hen-roosts, and even pig-pens, makes the surrounding atmosphere anything but salubrious. It is, therefore, an act of prudence to study the sanitary surroundings of a pleasure resort before incurring the exposure, and perhaps fatal danger, which unsanitary conditions always present.

Heart Diseases.

The State Board of Health Report for July charges "heart diseases" with 84 out of the total number of 877 deaths reported. This is certainly a very large proportion to be laid at the door of "weak hearts." Perhaps the following remarks, which we clip from an Eastern exchange, under the head of "Weak Hearts," may have some interest in this connection:

A weak heart seems to be decidedly more practically inconvenient than a weak head. If a man or woman be a little feeble about the region of the brain, it is generally of little moment. Some post or other will be provided if the conduct be respectable; and lack of brains is too common to excite any particular attention either in the person concerned or in those about him. But a weak heart insists upon putting itself in evidence at all sorts of convenient and inconvenient times. If its possessor finds himself rather late for his morning train, and makes a "spurt" to recover lost time, the exertion is usually followed by such a "bad quarter of an hour" that he resolves in future rather to lose a dozen trains than to risk temporary suffocation or permanent syncope again. The practical evils which are associated with a feeble heart are innumerable, and will readily suggest themselves to those who possess so unsatisfactory a pumping engine.

Weak hearts are by no means so common as is often supposed. Many a man who thinks he has got one is merely dyspeptic; many a woman owes her symptoms to tight lacing or insufficient feeding. If the dyspepsia be cured, or the tight lacing be dispensed with, the symptoms of heart weakness will disappear. Even when the heart is genuinely "weak," the weakness is not always due to special disease of that organ. It may be only part of a general weakness of the whole system, which is easily curable.

The late Sir Robert Christison, one of the most eminent of British physicians, used to smile at certain persons who were always complaining of weak hearts. "Gentlemen," he would say to his students when lecturing on digitalis, "gentlemen, the best tonic for a weak heart is a good brisk walk." Not a doubt of it. The majority of weak, flabby hearts are weak and flabby because every other muscle in the body is weak and flabby, and this general weakness and flabbiness is due to want of vigorous use. Exercise of the legs and back and arms gives additional and much-needed exercise to the heart, and the heart grows strong by vigorous exercise exactly as every other muscular organ does, for the heart is a muscle. If a man has no organic disease of the heart, no enlargement, and no functional disorder, plenty of brisk walking, with occasional running, will soon dispel his breathlessness and heart weakness, other things being equal. The muscular inactivity of the modern town man is the parent of more ill-health than any other single cause whatever.

Some Helps to Health.—William Blaikie, the author of "How to Get Strong," says that it is the little things which often turn the scale for or against health, and he gives the three following little helps which any one can practice and profit by: 1. To hold the body erect, whether standing, sitting or walking, and breathe deeply. This habit gives the lungs and digestive organs free play. More oxygen is taken into the blood, and the food is more readily digested and assimilated. 2. To fill the lungs full at frequent intervals, holding the air in the chest as long as is comfortable. This practice will soon improve a disturbed circulation. 3. To masticate the food thoroughly and secure a period of rest after each meal. Most thin people, he says, "do not keep still enough, do not take matters leisurely, and do not rest enough; while, if their work is muscular, they do too much daily in proportion to their strength." Thin people especially need to habituate themselves to deep abdominal breathing, as it aids greatly in digestion and promotes the vigor and health of many of the vital organs.

Corn-Silk for Dropsy.—It is not generally known that the silk on an ear of green corn is a powerful and efficient remedy for dropsy, for bladder troubles and diseases of the kidneys. In the Louisville *Medical News* we find an account of the medical properties of corn-silk and the cures that have been effected by its use. The way to use it is to take two double-handfuls of fresh corn-silk and boil in two gallons of water until but a gallon remains. Add sugar to make a syrup. Drink a tumblerful of this thrice daily, and it will relieve dropsy by increasing the flow of urine. Other diseases of the bladder and kidneys are benefited by the remedy, which is prompt, efficient and grateful to the stomach. The treatment can be continued for months without danger or inconvenience.

Maguey Plant Leaves.—What seems to be a reliable account of a case of hydrophobia, caused by eating the leaves of the maguey plant, is going the rounds of the Mexican press.

Useful Information.

Facts About the Feet.

The ideal foot of modern ladies is about a No. 3.

The common unit of lineal measure, a foot, was derived from the length of the human foot.

In a man 5 feet 11 inches tall, the foot measured 10½ inches, and the middle toe 2½ inches.

In Chinese subjects, the ordinary hight being five feet, the length of the foot was nine inches and five lines.

The longest foot of measure is that of old Turin, which is equal to 20 inches of English measure.

There was a time when not only each country but each town had a foot-measure of its own, indicating different averages of the different feet in various localities.

Among a tribe of low-stature Indians, whose hight varied from 5 feet 1 inch to 5 feet 3 inches, the length of the feet was found to be from 9 inches 4 lines to 9 inches 6 lines.

In order to get an idea of the length of shoe sizes in inches, it may be stated that a foot measuring 10 inches, with the weight of the body resting upon it, may comfortably wear a 6 shoe.

A youth in the South Sea islands, 6 feet 7 inches in hight, had a foot 12½ inches long. His lower extremities measured 38 inches in length, circumference of calf of leg 17½ inches, and his ankle 10 inches.

Incense.—Few know what is really used to produce the clouds of fragrant smoke, known as incense, in churches, says the St. Louis *Globe Democrat*. The odoriferous gum that goes by the name of incense, or gum olibanum, is a resinous gum produced by the Boswellia serrata or thurifera, a tall tree growing in the mountainous parts of India and belonging to the Terebinth family. The leaves, which grow at the end of the branches, are in ten pairs: Oblong, alternate, pubescent. The flowers are small and green, and in clusters smaller than the leaves. Each flower has five petals and ten stamens. The seed case is three-sided and has three divisions, each containing three seeds. The resinous fluid that exudes from the trunk and hardens rapidly is the incense. It forms in hard, semi-transparent, reddish or yellow drops, about the size of a pea. Incisions are made in the trunk to increase the flow. An inferior incense comes from Africa, produced also by a tree of the same family. Incense was highly esteemed in ancient times, and was used in the worship of many countries. The "thus," or incense, of the Hebrews and Greeks was the "styrax" of Arabia. Some ascribe the use of incense among the primitive Christians to the necessity of purifying the air in the catacombs and other subterranean places where they were forced to worship.

Thick Skins.—The whale, which belongs to the mammalia, no doubt holds the palm for thickness of skin. At some parts of the body the skin is only two inches thick, but in many places its pelt is fully two feet in thickness. The skin of the whale is the substance usually known as blubber, and in a large specimen will weigh altogether more than 30 tons. The distinction of being the thickest-skinned quadruped belongs to the Indian rhinoceros, whose hide has a knotty or granulated surface, and is so impenetrable as to resist the claws of the lion or tiger, the sword, or the balls of the old-fashioned musket. So stiff and hard is the skin that were it not divided by creases or folds the animal imprisoned in its armor could scarcely move. It is manufactured into leather of great strength and durability, and targets and shields are made of it that are absolutely proof against darts or sword strokes. The skin of the hippopotamus runs that of the rhinoceros very closely as regards thickness. When dried it is also used for shields, which are highly prized by the natives.

Burned Clay for Railroad Ballast.—The use of burnt-clay ballast is rapidly increasing among the railroads of the West. The Chicago, Burlington & Quincy railroad have a large amount in use on their lines in Iowa, and their officers are said to prefer it to gravel or broken stone. The Iowa Clay Ballast Company of Kansas City have a large contract on the Burlington and have done a good deal of work on the Rock Island road. They furnish the ballast to the Burlington Company, burnt and loaded, the company furnishing the coal and transportation, for 50 cents a yard, and the total cost when under the track, everything included, is figured at 94¼ cents per yard, compared with about $1 25 per yard for stone ballast. On the Rock Island road the cost is figured at about 63 cents per yard, burnt and loaded.

The Mammoth Sugar Refinery of Claus Spreckels at Philadelphia is now being equipped with its apparatus. The steam plant consists of 30 Babcock & Wilcox boilers, which are located on the first and second floors of the building. Each boiler is fired by a pair of Roney mechanical stokers, making 60 stokers in all. The stoker plant is so arranged that the coal is handled mechanically, and without manual labor of any kind, from the time the car of coal is dumped until the ashes are shot into the ash vault. Mr. Spreckels has thus far contracted for 31 Westinghouse engines as a part of the power plant. This will be the largest and best-equipped sugar refinery in the world.

The Oldest Steamer in the World is lying in Bowling Harbor, on the Clyde. The Industry, built in 1814, plied for 60 years on the Clyde, and was finally laid up where she now lies. Last year the engine, a side-lever one, with spur-wheel gearing, was taken out and placed in the Kelvinside Park at Glasgow. The old boat is fast breaking up, and will doubtless shortly disappear. The engine, however, will show to future engineers what a side-lever engine was like, and how it was connected by gearing to the paddle shaft.

Curious Tree Growth.—Growing out of the masonry of the French Catholic Church steeple in Biddeford, Me., almost at the upper limit of the brickwork, are two young trees. Both are green and healthy looking, and have grown rapidly within a year. They are beyond reach from the upper window, and could not be removed without a stage being built. The opinion is that one is a willow and the other a poplar. How they obtained root in the masonry is a mystery.

Change in Eggs.—It is a common fact that eggs, though so well inclosed, begin to decrease in specific gravity as well as freshness, as soon as they meet the air. This is shown by the popular test of age in lye or brine. A fresh-laid egg will descend to the bottom of a solution that will float it higher every day thereafter, until it will soon appear above the surface. A coating impervious to the air prevents these changes.

A New Antiseptic.—An antiseptic whiting has recently been introduced, and is recommended by the makers for hospitals, ships, stables, kennels, etc., in order to keep them free from insects. The compound, which appears to contain some camphor, is also useful for cleaning silver plate and articles of domestic use. The aroma is said to be not unpleasant, while the compound is non-poisonous and will not injure colors.

Machine for Wall-Paper Printing.—Herr Hansenn, a Danish engineer, has patented for ten years a machine for the color printing of wall-paper, which prints all the colors desired at one impression. Hitherto every color has necessitated a separate journey through the press.

Paris talks of building three more Eiffel towers and then turning the four into the legs of a huge platform, whereon a sanitarium can be built for invalids.

Engineering Notes.

The Panama Canal.

The managers of the Panama canal seem just now to be making efforts to dispose of the few assets remaining after its collapse. These assets consist of some 34,000,000 francs in lottery bonds. About 20,000,000 of these bonds were absorbed in some debts of a peremptory character, leaving 14,000,000 to be otherwise disposed of. This latter amount is being rapidly swallowed up by a host of engineers and hangers-on who still cling to the concern, and will continue to do so as long as there is a five-franc piece left to gobble up.

Still it is generally conceded that the project will be revived again at some time in the future, under new auspices, and by more careful and considerate managers, who will carry it forward to completion.

In the absence of any new organization in France to revive the work, the Nicaraguan Government will eventually fall heir to the property as it stands, and under its patronage some organization will be effected to complete the work. How much that work will cost is a matter of great uncertainty until a new survey has been made. The guess of engineers is about $150,000,000. It may be more; it may be less; but nothing is more certain than that the two oceans will eventually be united.

At the rate the commerce of the Pacific is increasing, the time will soon come, and probably inside of twenty-five years, when the Nicaragua canal, which will soon be completed, will be utterly unable to meet the demands for transportation. Indeed it may be doubted if two canals will be sufficient, even when supplemented by additional overland railroads. The history of our present overland railroad furnishes abundant evidence of the truth of what we are writing. As has been intimated, and with much good reason, it may not be very many years hence when the Republic of Colombia may be able to sell the right of completing de Lesseps' unfinished work for a large portion of the money that the unlucky Frenchmen have already put into it.

The Nicaragua Canal.—Work upon this enterprise is being rapidly pushed. Parties are engaged upon both the eastern and western terminus. Two thousand men are already at work and the force will be gradually augmented as the enterprise progresses. The Nicaragua canal will, in one way and another, be productive of much good to the entire Pacific Coast. The company has just issued a book showing some of the advantages which will accrue from the completion of the work. The sailing distances saved between various ports on the Pacific and Atlantic are shown on a carefully elaborated chart, and present a saving of time, distance and expense most surprising to those who have not given the matter any special attention. It will especially work a most important revolution in the industries of the Central American States—a movement which is already apparent. It will greatly increase the coffee crop as well as all other industries, and call for the introduction of machinery, railroad supplies, etc., which will no doubt be largely ordered from our own shops, both on the Pacific and Atlantic.

The Ship Railway.—The collapse of the Panama canal has put new life into the Nicaragua canal scheme as well as the project for the Darien ship railway. The two former are more fully referred to in other paragraphs. The project originated by the late Mr. John B. Eads, to build a railway across the Isthmus of Darien for the transportation of ships from sea to sea, is now being revived with renewed interest. The Mexican Government has recently amended the concession granted to Capt. Eads by guaranteeing five per cent interest on $60,000,000, the estimated cost of the ship railway. That is, they have agreed to make up any deficit there may be in the earnings of the ship railway when completed, to the extent of five per cent. Captain E. L. Corthell says the work of construction will begin at an early day.

A Greater Work than the Eiffel Tower. The great cantilever bridge across the Frith-of-Forth is completed, except the girders to bridge over the 350 feet between the ends of the cantilevers. One of the bridge's cantilevers set up on one end would be nearly as tall as the Eiffel tower. The latter weighs 7500 tons, while the Forth bridge has taken over 50,000 tons of steel. The one is for show merely. The other is one of the most wonderful works of useful engineering ever constructed and will endure for centuries.

The Most Wonderful Railroad.—Colonel North's railway from Iquique to Pisanqua, in the Chili niter district, is one of the most wonderful in the world. It zigzags up and down the Cordilleras in the solid rock for 48 miles. The engines drawing cars on the road are double-enders, exactly alike at both ends, with two smoke-stacks and one cab.

The three-feet gauge "system" has made great progress in disappearing this year, at least seven roads of this width having gone over to the majority and adopted the standard gauge.

The railway bridge over the river Dee, near Chester, England, will be shortly opened for traffic. It has taken 25 years to construct.

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Passing Events.

It seems that the Bear's Nest mine, Alaska, for which a 120-stamp mill has been built, does not come up to expectations. Reports from there are to the effect that over 1200 feet of tunneling fail to reveal any ore of value, and all labor has stopped.

Secretary Davies of the State Board of Trade is issuing circulars to the miners and mine-owners of the coast, asking for specimens of their mineral products, to be exhibited in the new California on Wheels. One department of one of the cars will be devoted to the mineral display, which will make California on Wheels complete, our wine, fruit, cereal and manufacturing industries being already represented.

The test case involving the title to the Eagle Bird mine will settle the question of the right of the railroad to the minerals. The miners claim that mineral land was excepted from the railroad grants.

Some English capitalists are buying copper properties in Mexico. A new company has put in $450,000 as working capital for the Chiapas mine.

The cruiser Charleston, which made several preliminary and successful trials in the bay during the past week, is now off on her official trial. The defects in her machinery have been remedied.

THE Oregon Coal Company intend to reproduce on a reduced scale at the Mechanics' Fair the Eiffel tower in coal.

Roll and Jig vs. Battery and Vanner.

The Commonwealth mine of Tuscarora, Nev., has been losing 20 per cent of the value of its ores since the mill was started, and the directors very wisely concluded that the continuance of milling with such results is so detrimental to the interests of the stockholders that the extracting and milling of ore should be suspended until such time as may be required to overcome existing defects. The grade of ore worked has been about $125 per ton, but a higher grade of ore would work to a better percentage, owing to its containing less calcspar or lime and a higher per cent of sulphurets. To obtain that grade at present would necessitate the extraction of only the highest grade, leaving large masses of ores, assaying from $15 to $75 per ton, to be mined hereafter, which, from the nature of the ground, would add materially to the expense over and above what it would cost were it all extracted at the same time. In order to obtain immediate returns from the whole output, and grade the ores for the most profitable results, the company has been constantly experimenting to find the cheapest and best means of doing so. While rolls for crushing and the jig principle of concentrating was found to be successful on ores containing coarse sulphurets, it was not found applicable to the characteristics of the ores of the Commonwealth.

The directors have made up their minds that they have in the plant now being erected by the Grand Prize Co. (batteries and Frue vanners) discovered the system of concentration best adapted to Commonwealth ores. The product from the Frue vanners, which will be high-grade ore, will contain the required per cent of sulphurets to mix with the milling ores to insure their successful treatment to a high per cent of their value.

Under the circumstances the company has decided to stop taking out ore until the best methods available can be put in operation to treat the ores.

Mining Premiums.

The directors of the El Dorado District Fair offer for the best and second best general display of fruit, premiums of $150 and $75; for the best and second best display of vegetables, $100 and $75; for the best and second best display of minerals produced in El Dorado county, $30 and $25. This county is that in which gold was first discovered in California; and the amounts offered for the respective articles show the change which has come over some of the mountain counties.

Even the State Fair now pays little attention to mining products. Yet there were days when it was thought proper to offer prizes for many things connected with the mining industry. We have before us an old scrap-book in which is an extract from the Marysville *Express* of Nov. 27, 1858, which contains the following list of mining premiums awarded by the State Agricultural Society for 1858:

QUARTZ MILLS.

1st Premium—Gold Hill Mill, Nevada county.
2d Premium—Gold Bluff Mill, Sierra county.

SHAFT MINING.

1st Premium—Alta Shaft Co., Nevada county.

HYDRAULIC MINING.

1st Premium—Dead Man's Claim, North San Juan, Nevada county.
2d Premium—Wyoming Claim, Nevada county.

RIVER FLUME.

1st Premium—Union Cape, Butte county.
2d Premium—Channel Rock, Butte county.

This shows that Grass Valley carried off the first premium for both shaft (drift), and quartz mining. The Gold Hill mill was at that time in charge of Melville Attwood, Esq., now of this city, who also received a silver medal for the best amalgamator exhibited at the fair.

It would seem perfectly proper to have continued these premiums for mining and milling. At that time a special committee personally visited the competing mills and mines, and on their report was based the awards. It would be a good thing in these days to have some public competition in the matter of milling of gold ores and construction and arrangement of gold mills. This would arouse a spirit of rivalry of great benefit to the mining industry. People now about to build do not know where to look for the best example of a mill, but official recognition of any one would soon make it conspicuous.

Hydraulic Engine for Mining Purposes.

Mr. H. D. Pearsall of London has devised a hydraulic engine for supplying water at pressure for hydraulic mines. The advisability of pumping water instead of supplying it by gravity has often been suggested, when sufficient water-power for the purpose of pumping happens to be available. But the expense and complication of machinery has heretofore prevented. Mr. Pearsall was called upon to make plans and estimates for an extensive placer mine in Colorado, and devised pumping arrangements to cost less than half what a ditch on the usual plan would cost. The hydraulic engine is shown in the cut. It is one which is in use in England, and is similar to that designed for the placer mine.

The engine or machine acts on the principle of the hydraulic ram to this extent: That both the new machine and the hydraulic ram "obtain their pumping-power by the arrest of a column of water which has been previously set in motion by gravity."

The new machine differs so much in construction from a hydraulic ram that the objections to which the latter is open are not applicable to the new engine.

The feature of hydraulic rams which has restricted them to a small size is their violence. In the new machine this is not only reduced, but has no existence at all. It works with all the smoothness of a well-constructed reciprocating engine.

By using what may be called the fundamental principle of the hydraulic ram, we are able to do what we cannot do in any other way—pump water by the agency of water-power directly by one machine, instead of using turbines to obtain power, which turbines have then to drive pumps. Moreover, this one machine is a far simpler one than the pumps alone which would otherwise be required, and as it works very slowly it requires much less repairs.

The construction of the engine is shown in the engraving on page 141, as follows: *A* is a pipe (called a flow pipe) which conducts water from the source of supply to the engine. *C* is the main valve (here shown open). The water flowing down the flow pipe freely escapes through valve *C*, when it is open, as shown in the figure. *D* is a rod attached to valve *C*, by which valve *C* is moved up and down at proper intervals of time by means of the motor *E*, further described below. *F* is a chamber or receiver immediately above valve *C*. At the period of the stroke of the engine, which is represented in the figure, this chamber contains only air, and communicates freely with the atmosphere by the pipe *G*. At the base of pipe *G* there is a valve *J* which carries a float.

When the main valve *C* is raised and closed it of course shuts off the flow of water; but it does not interfere with the flow of water until it is *completely* closed, because, until the chamber *F* is filled with water up to the float *H* the valve *J* remains open, giving free communication between chamber *F* and the atmosphere, consequently the air freely escapes from the chamber and the water freely rises in the chamber. This action takes place *during the closing* of the main valve *C*. The consequence is that no power is wasted in forcing water through the narrowing orifice. A second consequence is that there is no necessity to close this valve with great rapidity (which is necessary in hydraulic rams). As a matter of fact it is closed by a gradually retarded motion and so comes to rest without any concussion. When the water touches the float *H* it closes the valve *J*, shutting off the passage for escape of air, and the pressure in the chamber then rises to the point at which the valves *K* open, and some of the water flows into the air vessel *L*, from which it of course is constantly flowing out through delivery pipe *M*. A little air still remains in the chamber. This air is compressed and enters the air vessel, and is used to drive the motor which actuates the main valve.

The column of water flowing in the flow pipe is thus brought to rest entirely by the elastic resistance of air. When it has ceased to flow the main valve is again opened, the water with which the chamber *F* is now full escapes, the air valve *J* falls open, admitting atmospheric air, and the water again begins to flow and to escape through valve *C*.

The engine which it is intended to construct for the placer mine is similar in every respect to this one but of larger size, and is expected will supply 1000 miners' inches, or 10,000 gallons per minute.

The works to be constructed for the placer mine consist of a short ditch, about two miles long, which will be entirely made by plowing, and in alluvial soil. In this distance a fall of 80 feet is obtained, and here hydraulic engines of the above description will be erected about half a mile up the gulch, the stream from the short ditch flowing through the pipe to the machine, and a proportionate part of the water being raised directly to the hight desired.

Besides economy the system has the following incidental advantages: The water may be used with a high pressure even at the highest points of the placer, which is often difficult to arrange when using only gravity. The pressure available for hydraulicking is not limited by the topographical features of the country, as is often the case in the ordinary system. At the point where the machines are erected, a large extra supply of water is available besides that at high pressure, and will greatly help to keep the tail-flume clear.

Lixiviation.

Mr. C. A. Stetefeldt, M. E., formerly of this city, but for some years past a resident of New York, has returned to San Francisco, where he will remain for the present. Mr. Stetefeldt is the inventor of the furnace which bears his name and is the author of "The Lixiviation of Silver Ores with Hyposulphite Solutions." In speaking of the leaching process at the Marsac mill, Park City, Utah, Mr. Stetefeldt says that they still amalgamate a small part of the ore because they have not enough vats to leach all the ore. Additional vats have been ordered, however, and will soon be in place, when pan-work will be stopped altogether.

Mr. Russell, the inventor of the Russell process, is at present at Sombrerete, where he has successfully introduced his method of treating ores. The results are satisfactory to Mr. Clarence King, who is now there.

It is understood that the Blue Bird mine, Butte, M. T., will soon use the lixiviation process. When in Chicago recently, Mr. Stetefeldt was shown by Fraser & Chalmers specifications for a leaching plant for this mine, on which bids were asked.

Mr. Stetefeldt will shortly make a trip to Park City, where he will make certain tests on some Mexican ores.

In addition to what we are told by Mr. Stetefeldt, it is learned from Modest Maryanski, in charge of the Arlington mine, Ruby district, Whatcom county, W. T., that the process will be adopted there. The ores have been thoroughly tested by different processes. The results from a carload shipped to Park City, Utah, were the most successful, averaging over 97 per cent of the assay value of the ore, and it was finally decided that the Russell lixiviation process in use there should be adopted. Messrs. Maryanski and Geo. W. Woodward are now in this city, and it is understood they have already contracted for a 50-ton plant, at a cost of over $80,000. This calls for the completion of the machinery by the 1st of December next, and the company hopes to be running full blast at the opening of the new year.

AT the last meeting of the Geographical Society of the Pacific, the secretary, C. Mitchell Grant, read an essay on the life and work of Henry M. Stanley, the African explorer. Prof. Davidson read two papers, one on the "Currents in and About the Golden Gate," and the other on the "Eddy and Inshore Currents off the Coast." The papers were illustrated by a chart of the coast from this port, following the coast line to Kodiak, Alaska, and described the researches made and information gathered by the professor in connection with coast currents during a period of over 20 years.

LOWER CALIFORNIA DUTIES.—The cashier of the Tia Juana Custom-house says his office has received orders from the Mexican Government instructing the Collector of Customs to require the payment of full duty on all goods, wagons, buggies, etc., from all persons crossing the line whose destination is beyond 15 miles of the neutral territory. This virtually puts a stop to the mining operations of Americans in Lower California, as few will consent to pay the heavy duties. Two wagon-trains were turned back from the line recently.

Bimetallism.

The State Department is in receipt of a report by Consul Frank H. Mason of Marseilles, in which he says:

One of the clearly defined tendencies of public opinion in Europe, notably in France, Germany and England, is seen in the steadily growing sentiment in favor of restoring a bimetallic standard of currency. In the strong and numerous petitions read before the German Reichstag, in recent resolutions of Chaplin in the British House of Commons, as well as the frank declaration of Lord Salisbury in favor of earnest participation in Great Britain in the forthcoming conference at Paris in next month, and in the outspoken attitude of such serious and influential French journals as *Le Moniteur, Des Interets Materiels* and *Moniteur des Syndicats Agricoles* may be recognized the outward manifestations of this new faith and purpose.

The above shows that our representatives abroad are beginning to awaken to a realization of the fact that there are other interests besides that of commerce which are deserving of careful watching, particularly that of finance and its bearing toward bimetallism. Their official position must undoubtedly give them superior facilities for securing valuable information on the subject—such information as would throw much light on the injurious effects of monometallism. Their efforts would officially confirm very many of the statements based on commercial and financial statistics put out by friends of bimetallism, and do no little toward converting the many to its support.

There is no doubt that the extraordinary effort of the European Governments to hoard gold against a general war in the Eastern Hemisphere, has convinced many leading financiers, as well as many astute statesmen, that the time is not only ripe for bimetallism, but it is a growing necessity. This necessity is recognized in the official statements of leading continental banks as published in a tabulated form in a late issue of the New York *Financial and Mining Record*. The statement in question gives the footings as follows:

	Gold.	Silver.
Bank of France	$203,270 000	$248,260,000
Imperial Bank of Germany	157,350,000	78,675,000
Austro Hungarian Bank	27,250,000	78,250,000
Netherland Bank	25,620,000	33 335,000
National Bank of Belgium	13,940,000	6,970,000
Bank of Spain estimate	50,000 000	12,335,000
Totals	$477,380,000	$457,925 000

	Circulation Notes
Bank of France	$576,825,000
Imperial Bank of Germany	249,151,000
Austro-Hungarian Bank	197,695,000
Netherland Bank	90,575,000
National Bank of Belgium	71,725,000
Bank of Spain estimate	145,236,000
Total	$1,130,105,000

The leading or national bank of Russia is not given, which, if obtainable, would impress the student of political economy still more forcibly that bimetallism is a growing necessity. The above shows that the circulating notes of the six leading continental banks are in excess of the gold held, $652,725,000, and of both gold and silver $194,800,000. So that if a run was made on the banks, or, as for that, any one of them, there would not be coin on hand to meet the demand. This is one way in which to view it, but there is another of equal moment, viz., the relation of coin to commerce.

A patient but deservedly recognized authority on financial subjects presented tabulated statistics, which went to prove that the world's commerce had increased from the year 1830 to 1880 from $1,840,000,000 to $13,250,000,000, and that during the same time the value of the world's coin had only increased from $1,565,000,000 to $5,640,000,000. The value of trade has increased, by this calculation, more than twice as rapidly as the value of money. Facilities for the transfer of bulk have been multiplied many fold since 1830, but the medium of exchange has not increased four fold. The rate of coin to commerce in 1830 was 85 per cent, and in 1880 42 per cent.

As gold is the standard money and the cash reserve for all forms of credit in the two hemispheres, and its ratio to the volume of commerce is only half as large as formerly, it follows a mathematical induction that its carrying power has doubled. It is in effect carrying more than twice the value to the units, which means that its exchange value is doubled, or, in plainer terms, that it is worth twice as much. This at first would have been the exact mathematical product of the changed conditions had not the system of shifting cash to credit been immensely expanded—the substitution, in fact, of margin dealings under various devices.

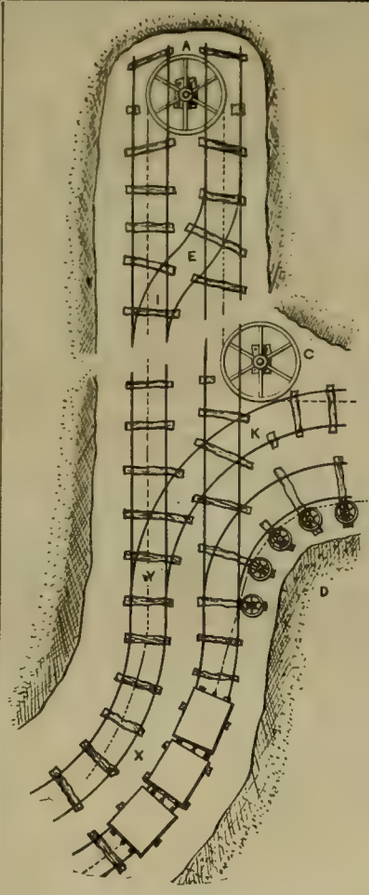


Fig. 2.—THE ENDLESS ROPE SYSTEM APPLIED UNDERGROUND.

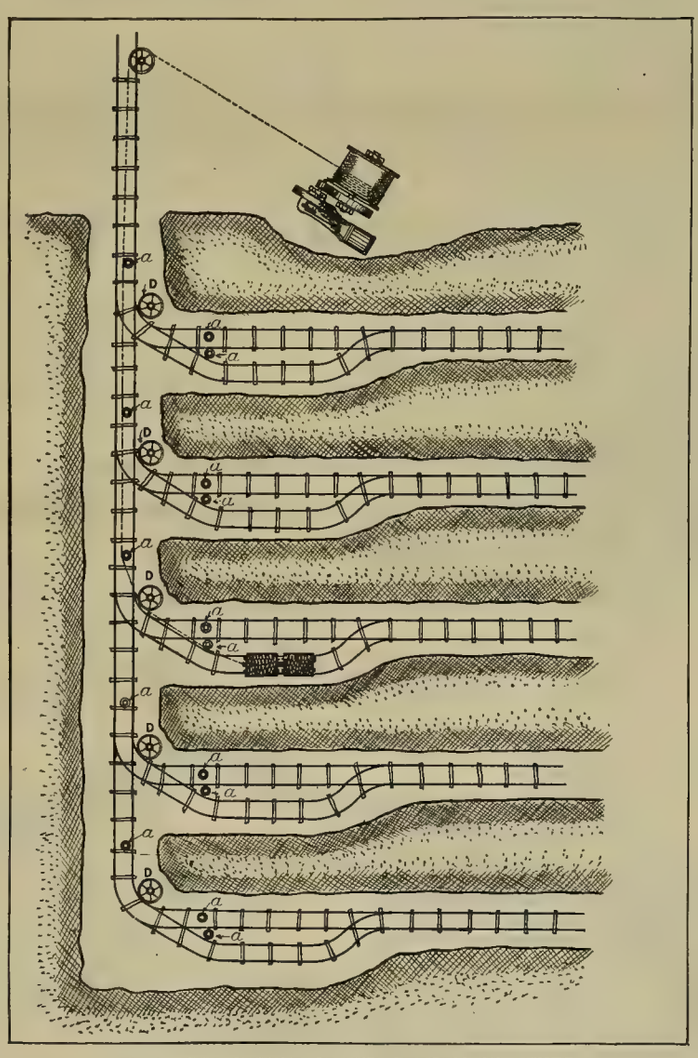
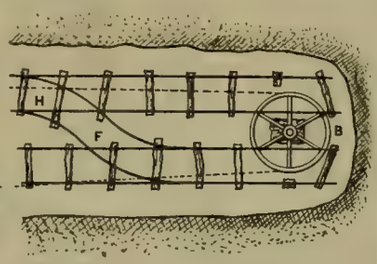


Fig 1.—THE SINGLE PLANE SYSTEM IN MINES.

The gold reserve of the banks of England and of the British Isles is about 4.7 per cent, while in the United States the bank deposits aggregate over $3,000,000,000, and specie held by them of only about $200,000,000. Every debt is a gold debt except in the United States, where we have greenbacks, silver and gold certificates, and silver coin which may, in an emergency, stand off any demand for gold. The first three are themselves redeemable by the United States Treasury on demand.

Wire Rope Haulage in Mines.

We have formerly quoted from Mr. F. C. Roberts' paper on "Wire Rope Haulage and its Application to Mining," and now reproduce cuts showing arrangements of underground



tracks. Fig. 1 a single engine plane. In this it is usual to employ a non-reversing engine, and, as in the case of the single hoist, the slope may be operated by employing the power of the engine but half the time. In such instances the empty cars are allowed to descend by gravity, the drum running freely on the shaft for the time and being controlled by a strap-brake or friction-clutch. It is sometimes convenient to locate the engine at the foot of the plane, the hoisting rope being supported along the side of the slope by rollers and led to the head of the plane, where it passes around a wheel of large diameter and, returning down the track, is attached to the car.

The single-slope system is peculiarly applicable where there are a number of side-entries located at different levels below the surface. In this case the train of descending cars may be stopped at the entry into which it is desired to switch some of the trucks, the train in th meantime being prevented from premature starting by a lock consisting of a timber pivoted and thrown over the rails. When the disconnection has been made, the signal is given and the train descends to a lower level, where the operation may be repeated. In hoisting to the surface, the cars in the various side-entries are run to the main entry, and, in a manner similar to that above described, switched to the main slope and connected to the rope.

An improved modification of the single plane is illustrated in Fig. 1. Here, for the accommodation of the empty or loaded cars, each side entry has its individual parting or siding placed near the main entry, and in this way the plane is practically divided into as many separate planes as there are entries. Loaded cars are taken from each entry in succession, and the empties returned in the same order, the position of the end of the rope being indicated to the engineer by marks upon the rope, or better, by an indicator attached to the drum. Proper switches, etc., are located at the desired points, and the rope is guided into the entry by drums, *D*, placed in the angles as shown. These drums have a face of two and a diameter of five feet. Guide rollers, *a*, are placed at suitable points.

Fig. 2 shows a form of the endless-rope system. Endless-rope haulage is divided into two systems: 1. That in which the motion of the rope is continuous in one direction; and 2, that in which the rope is driven alternately in opposite directions. The first is the double track and the second the single. The latter is practically the tail-rope system, used in connection with an endless wire rope. The chief advantage of the endless system is that it permits stopping or starting the train at will without interrupting the motion of the engine, and in this manner does away with the system of signals necessary to a tail-rope plant. A familiar application of this system is that of cable railways for passenger traffic, which, in fact, is a complete and extensive endless-rope haulage system.

The operation of the side entries and branches in the single-track system is similar to one of the tail-rope methods, except that in this case the rope is continuous. A grip is used to connect with the rope. The jaws are about 1½ inches above the level of the rope when resting on the supporting rollers. In order to enable the grip to clasp the rope when starting a train, counterweighted supporting rollers are placed at convenient points. These pulleys raise the rope at the desired points to the level of the grip, and their vertical motion permits the passage of the grip without difficulty. Referring to Fig. 2 it will be seen necessary to introduce these pulleys at points *H* and *Y*. In many mines it has been found more convenient to adopt such arrangements that the rope is stopped for attaching and detaching.

Latest Copper Situation.

With the decline in the price of copper comes a corresponding increase in the consumption. For a verification of this we need not go outside of the United States. According to the latest official statements of the output of fine copper by the leading mines in this country, that for the first half of 1889 compares as follows with the first half of 1888:

LAKE SUPERIOR MINES.	Pounds.
1889, 12 mines	42,000,000
1888, 9 mines	38,000,000
Increase	4,000,000

MONTANA MINES.	Pounds.
1889	13,400,000
1888	7,400,000
Increase	6,000,000

From these two sources alone the output the first six months of this year over the like time in 1888 was 10,000,000 pounds. The tabulated statement of the output showed that in the month of June this year there was a falling off of the Lake Superior mines, compared with the output for the month of May, of 600,000 pounds. The natural inference from this is that the output is being decreased. While the output shows an increase, the exports show a falling off, for the official returns of the exports of ingot copper from this country for the fiscal year ending June 30, 1889, were only 14.324,043 pounds, against 25,303,337 pounds for the preceding fiscal year.

Turning to Europe, we find that the stock of copper is being steadily lessened under a free consumption. The latest information

gives the stock of fine copper the world over at 107,975 tons on the first day of the present month. Although this is unquestionably a heavy incubus for the trade to carry, yet large as it is, it shows a falling off of 16,895 tons since last March, in which month stocks reached the highest point on record. With a reduction in the stock of 16,895 tons in four months' time, it would take at that rate just about 15 months (presuming the output would not be increased or prices inflated to retard consumption) to reduce it to the lowest point ever reached—December, 1877, when it was only 42,300 tons.

Mexican Lead Ores.

In different parts of Colorado the miners have been holding meetings and passing resolutions asking the President and Secretary of the Treasury for relief in the unwarranted advantage given importers of ore containing lead into this country from Mexico. At a recent meeting at Leadville, the following resolutions were adopted, which are of the same general tenor as those passed elsewhere in the State:

WHEREAS, The first civilized settlements of the territory now embraced within the limits of the State of Colorado were made by the pioneers who visited it in search for minerals carrying precious marketable metals; and

Whereas, Since the advent of the first miner, the territory has yielded over $250,000,000 in gold, silver, lead and copper; and,

Whereas, Solely in consequence of Colorado's mineral wealth, it is now a prosperous State, with a population of 400,000 people; and,

Whereas, The major part of the valuable metal product was derived from lead ores, which carry varying amounts of silver with lead always a prominent and often a preponderating factor of value; and

Whereas, Remoteness from the center of population makes it impracticable for the State of Colorado to compete as an agricultural, manufacturing or stock-growing region with States which have the advantage of easy access to the great markets of the country; therefore, be it

Resolved, That the past growth and present condition of this State is due to and its future prosperity depends mainly upon the production of argentiferous lead ores, which directly furnish employment to a large proportion of the mining population and indirectly constitutes the support of the entire people.

Resolved, That the encouragement and conservation of the mining interest is a matter of vital importance, not only to those engaged in mining as a business, but also to every professional and business man, every farmer, mechanic or laborer.

Resolved, That the price received for lead contained in ore product in the mining districts is of so great importance that pursuing any course which tends to lower it to the standard of the cost of production in a neighboring country where low wages prevail, is a matter of grave concern to every business interest and wage-earner in the State.

Prevailing Construction.

Resolved, That the prevailing construction of the clause of the statutes of the United States, which empowers a duty upon the importation of foreign lead ores, amounts practically to their admission duty free, as is evidenced by the large daily increasing importation of such ores from the Republic of Mexico, upon which no duty is paid, the traffic in which has increased from 7000 tons in 1884 to 84,000 tons in 1888.

Resolved, That the constructions which involve the classification and collection of import duties, by preponderating the weight contained in metal bullion and preponderating the value of metal contained in ores when the duty on each is imposed by some statute in practically the same words, are themselves contradictions and stultifications which call for a revisal or reconcilement, so that in any event the basis for revenue collection may be identical.

Market Fluctuations.

Resolved, That the determination as to the dutiable and non-dutiable character of an imported ore by classing it as an ore of that metal of which it contains the greater value is varying, uncertain and impracticable, in that where values are approximately even it may be a "lead ore" one day and a "silver ore" the next, owing to a slight rise or fall in the market value of either metal, and further, in that such construction presents an open door to fraud, as dutiable "lead ore" may be transformed into non-dutiable "silver ore" by the addition of a small quantity of mineral grading high in silver.

Resolved, That in making inquiries as to the bearing which this construction of the statute has upon the interests involved, the authorities should have sent their agents to the lead-producing districts of the United States as well as to a few border towns and other places in which are located reduction works deriving their lead-ore supply from abroad.

How Miners Classify.

Resolved, That as miners and inhabitants of the mining region, we have never considered it necessary to consult an assayer before classifying galena or other ore which from its weight and appearance to the eye evidently contained a large percentage of lead. The invariable rule is to call all such "lead ores," although the value in silver and gold, be they great or less, can only be determined by careful tests and the exact lead contents by a similar test.

Resolved, That we demand that protection for our chief industry which the existing tariff Act was intended to provide, and we call upon the treasury department of the Government to reconsider and reverse the nullifying construction heretofore made.

Resolved, That the chairman of this meeting is instructed to forward a copy of these resolutions to the President of the United States and to the Secretary of the Treasury.

On the 12th inst. the Southwestern Mining Association met at El Paso to take action on the Mexican lead-ore question. The association represents the mining interests of Texas, Arizona and New Mexico, besides the American miners in Mexico. They want the importation of lead ores from Mexico continued on account of the smelting (not mining) interests. The resolutions adopted by the association are as follows:

WHEREAS, At the instance of the lead monopolists of Colorado, a meeting of citizens was recently held in Denver, the object of which was to protest against the free importation of lead ores from Mexico and other countries, and resolutions to that end were adopted; and whereas it is the manifest aim of these monopolists to encourage the use of public opinion demanding the repeal of the law now in force on such importations and a reversal of the rulings heretofore made by different Secretaries of the Treasury by which the introduction of such ores from Mexico has been made an exchange of commodities with that country; and

Whereas, Such resolutions seek to break down and destroy the smelting interests of the Southwest by denying the importation of fluxing ores essential to the smelting of dry and refractory ores, which are the products of Texas, New Mexico and Arizona; and

Whereas, Further growth and prosperity of the Southwest is already well advanced and will continue to be mainly dependent on the commercial relations now subsisting between Mexico and the United States; and

Whereas, To insure continuance of this prosperity and to encourage the growth of that section, every channel of trade for the importation of Mexican ores to be employed in payment for the exportation of American products and manufactures, should be kept open and constantly widened by legislation; and

Whereas, That section, with its many new and well-equipped smelting plants and Mexican silver-lead ores introduced free of duties, combined ample conditions and facilities for the profitable reduction of its own ores, thereby saving from waste a large per cent on account of the treatment of dry and refractory ores and the freight thereon to the smelters of Colorado; therefore it is

Resolved, By the El Paso and Southwestern Mining Association: First—That in behalf of the mining interests of Texas, New Mexico and Arizona we condemn the methods and aims of the Colorado men, and as well the spirit and purpose of the resolution referred to, and claim from the Government of the United States protection and equal rights. Second—That copies hereof be forwarded to the Secretaries of the State and Treasury Departments and each member of Congress from the State of Texas, and the delegates from Arizona and New Mexico.

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By order of the Board of Directors.
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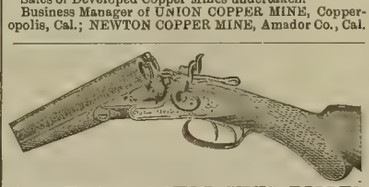
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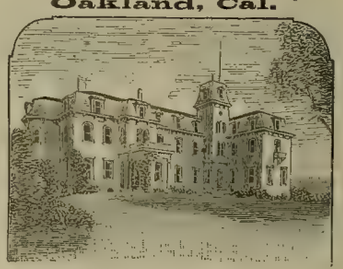
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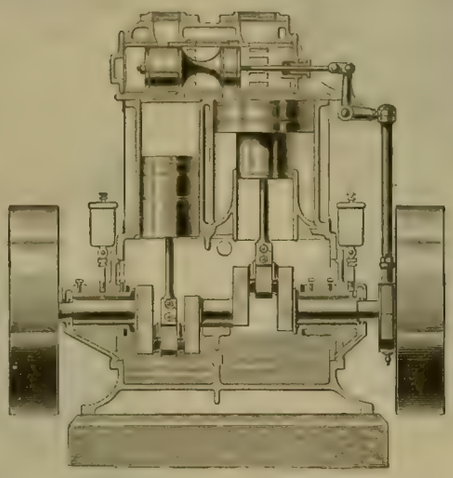
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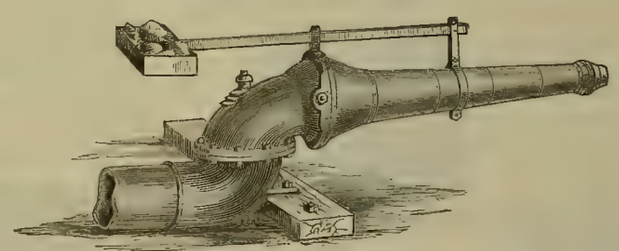
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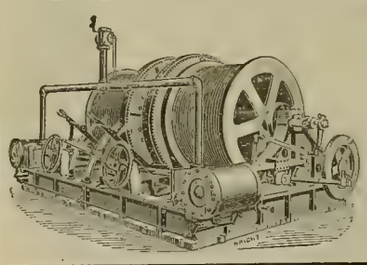
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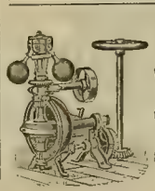
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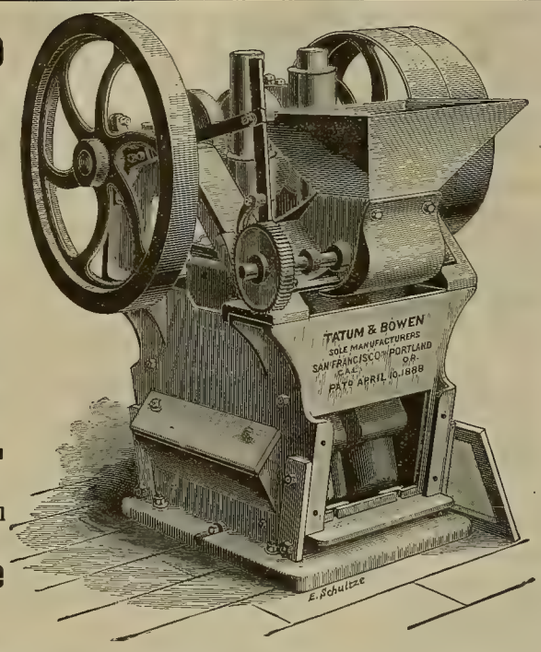
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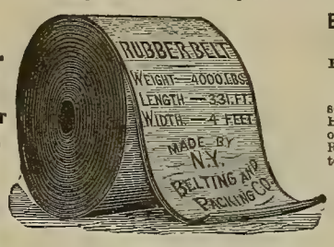
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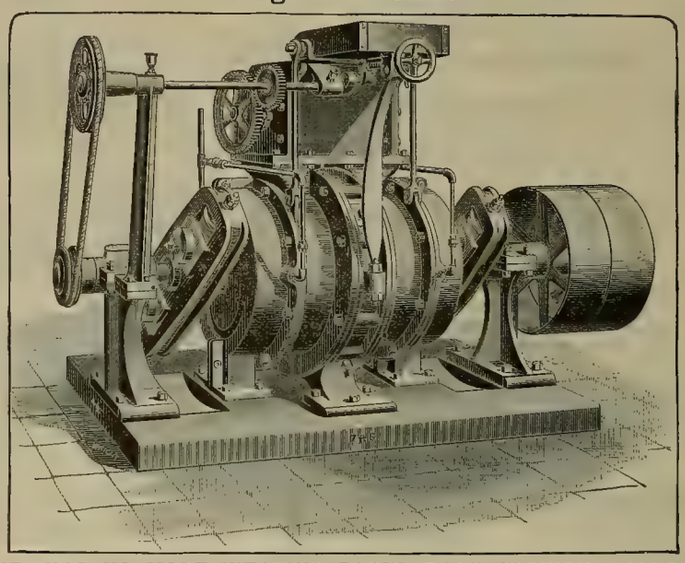
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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific States.

From the official report of U. S. Patents in Dewey & Co.'s Patent Office Library, 220 Market St., S. F.

FOR WEEK ENDING AUGUST 13, 1889.

409,091.—ORE CONCENTRATOR BELT—John M. Adams, S. F.

409,092.—ORE CONCENTRATOR BELT—John M. Adams, S. F.

409,095.—ADJUSTABLE GEAR FOR CRUSHING ROLLS—Hans C. Behr, S. F.

408,942.—FINGER GUARD—E. H. Chesterton, Los Angeles, Cal.

409,029.—TOBACCO AND MATCH CASE—F. E. Elliott, Miles, W. T.

409,104.—CONDUIT ELECTRIC R. R.—Byron Jennings, San Jose, Cal.

408,929.—SOLAR WATER-LIFTING APPARATUS—A. L. Reynolds, Elsinore, Cal.

408,930.—HARROW—S. Rothchild, Pendleton, Or.

409,058.—DRIVING OR STOP MECHANISM—Oscar W. Schmidt, S. F.

409,072.—AMMONIA CONDENSER FOR ICE MACHINES—Paul Steck, Oakland, Cal.

408,944.—SAFETY STIRRUP—J. C. Welcome, Burns, Or.

409,084.—ORE CRUSHER—G. W. Weller, Baker City, Or.

The following brief list by telegraph, for Aug. 21st will appear more complete on receipt of mail advices.

California—Kasson A. Brigham, Gilroy, two-wheeled vehicle; John E. Foster, Ferndale, horse-blanket; Adam W. Gilfillan, Mendocino, high and low water alarm for steam boilers; Frederick E. Gladwin, San Francisco, type-writing machine; Christian F. Jacobson, San Francisco, dry ore concentrator; Jacob G. Kenyon, Port Kenyon, vehicle axle; John H. Liso, Los Angeles, assignor of one half to W. S. Maxwell, combined wrench and oil can; Harry H. Lore, [Sacramento, posting or copying guide for bookkeepers; William Patterson and E. Groat, San Francisco, assignors to California Bituminous Block Manufacturing Company, bituminous sand rock for building, roofing and repairing purposes; Jacob Price, San Leandro, bailing-press; Alexander Watson, San Francisco, brake for railways; Edwin J. Weston, San Francisco, machine for cutting off piles; John J. Williams, San Francisco, smelting furnace.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

HARVESTING MACHINE.—James H. Adamson, North Melbourne, Victoria. No. 408,398. Dated Aug. 6, 1889. The invention relates to certain improvements in harvesting machines of that class in which a comb having long pointed teeth is employed to strip the heads from the standing grain without the use of a reciprocating sickle, and it consists in making the combs adjustable, so that the teeth may be opened or closed to suit heavy or light crops.

VEIL-FASTENER.—Philo N. Tyron, S. F. No. 408,445. Dated Aug. 6, 1889. This fastener consists of two rings, one of which is slotted so that the other will pass into the slot, the two being thus locked together. One end of the scarf or veil to be fastened can be drawn into each of the rings, being held by the fingers. The veil is brought across the face, the ends being brought together behind the head and the two rings are brought together and latched, and they compress the ends of the veil or scarf, and thus hold it firmly and prevent its slipping out. The rings are easily detached from each other by slightly pressing them, so as to release the catches.

CONDUIT ELECTRIC RAILWAY.—Byron Jennings, San Jose. No. 409,104. Dated Aug. 13, 1889. This improvement in electric railways consists in a means for insuring a continuous electrical connection while allowing for the expansion and contraction of the electrical rails upon which the trolley or conducting wheel travels, and in a means for securing and adjusting the brackets upon which said rails are supported. The invention is an improvement in that class of electrical railway in which an underground conduit is employed with an electrical rail upon which a trolley or wheel travels to keep up a continuous electrical connection between the rails and the motor; and the improvement is designed to keep the electrical rail in perfect condition as a conductor, and to secure and adjust the brackets by which it is supported so as to keep it approximately parallel with the line of travel of the car and motor.

ORE-CRUSHER.—Giles W. Weller, Baker City, Oregon. No. 409,084. Dated Aug. 13, 1889. This invention relates to that class of ore-crushers in which the material is fed and crushed between opposing movable jaws. In this the crushing jaws are pivoted on horizontal shafts in the ends of the frame, adapting them to be moved up and down through an arc in a vertical plane about the shafts as centers. The working faces of the jaws are curved oppositely with respect to each other and are provided with shoes. Two transverse shafts in the upper part of the frame are connected to gears from which depend links, the lower ends of which are connected with the crushing jaws. The jaws are raised and lowered simultaneously by the crank-shafts and links. As they rise, the space between the upper portions of their shoes widens and the space between the lower portions contracts. As they fall, the space between their upper portions contracts and the space between their lower portions widens. The ore passes down into the opened portion between the upper portions of the jaws as they rise and is crushed between them as they fall, being readily discharged from between their separating lower portions.

AMMONIA CONDENSER FOR ICE MACHINES.—Paul Steck, Oakland, assignor to Parke & Lacy Co. No. 409,072. Dated Aug. 13, 1889. The invention relates to the class of ice machines, and especially to the condensers, through which the ammonia is passed and in which it is condensed by the water which trickles over the exterior of the pipes. It consists in a novel condenser composed of separated sections or coils of pipes, the lowermost pipe of each section or coil being connected with the uppermost pipe of the section or coil adjacent, an inlet for the ammonia gas to the top of the first section or coil, and an outlet for the liquid ammonia from the bottom pipe of each section or coil.

ADJUSTABLE GEAR FOR CRUSHING ROLLS.—Hans C. Behr, S. F., assignor of one-half to Benjamin T. Lacy. No. 409,095. Dated Aug. 13, 1889. The invention consists in the novel mechanism for varying the position of the gear on its shaft by adjusting it rotatively and holding it in the position to which it is adjusted. The object is to provide for so moving or changing the position of the gear as to effect the accurate adjustment of the parts to be driven. In ore-crushing mills, in order to secure the most uniform size of crushing material, the rolls should in all positions of revolution present the same width of opening between the two corrugated crushing surfaces. Where this is not the case the rolls are not in proper adjustment, and as a consequence the space varies and the product varies very much in the size of the particles. In order to overcome this difficulty, it has often been found necessary to refit gears on the roll shafts in different positions by cutting other key-ways or enlarging existing ones and introducing wider keys; but by Mr. Behr's invention either one of the gears may be readily and accurately adjusted upon the roll shaft and held in that position, so that the space between the rolls shall be uniform and the resulting product as desired.

CONCENTRATOR BELT.—John M. Adams, S. F. No. 409,091. Dated Aug. 13, 1889. This is an improvement in that class of endless belts such as are used on the Frue concentrator. The invention consists in a novel improvement in that form of ore-concentrating belts which are provided with overflow apertures, the mouths or edges of which are elevated above the pulp-holding surface. The object is to better direct the overflow from the pulp-holding surface by discharging it at the lower end of the machine and not allowing it to fall down directly under the belt, which results in injury to and undue wear on the rollers on which the belt rests and travels, and other portions of the machine, and also results in wear on the belt itself, on its under surface, caused by the sand working between said belt and rollers.

ORE CONCENTRATOR BELT.—John M. Adams, S. F. No. 409,092. Dated Aug. 13, 1889. The object of this invention is to increase the concentrating capacity of such belts as are used in endless belt concentrators. The surface of the belt, instead of being smooth, as is usually the case, is made undulating, this result being obtained by forming or fashioning the surface with gentle continuous concaves and intervening continuous ridges, both extending in the direction of the flow. The object of this construction is to allow the sulphurets and heavier portions of the material under treatment to fall rapidly and positively to the lowest portions of the depressions or concaves, thereby effecting a more complete and rapid concentration.

DRIVING OR STOP MECHANISM.—Oscar W. Schmidt, S. F., assignor of one-half to I. S. Cohn. No. 409,068. Dated Aug. 13, 1889. This invention relates to that class of mechanisms adapted for throwing machinery into and out of connection with the power device, or stopping the machinery positively when disconnected. The invention consists in certain constructions and combinations of devices.

THE SUNFLOWER.—Late advices from Pike City, Sierra county, state that the Sunflower Gold Mining & Milling Co. are making active preparations for the erection of a mill and all necessary buildings for the reduction of ore. Two five-foot Huntington mills have been ordered and arrangements made for a third if it is needed. The entire lot of machinery, engine, boiler, ore-crushers, etc., will be shipped this week, and everything will soon be under cover before the rains set in.

THE Plumas *National* tells of a curious deed that is on record in that county. The grantor conveys to the grantee "all the mines and minerals contained within 3000 acres of land, reserving all the timber growing upon said lands, except such as it may become necessary to remove to extract the minerals." It is thought no such instrument appears on record in any other county of the State.

Mining Personals.

C. M. Clark is superintendent of the Dixie mine, Arizona.

Geo. D. Roberts, the mining speculator, has gone to Montana.

R. P. Keating, superintendent of the Savage mine, is in the city.

J. H. Marriott is superintendent of a hydraulic mine at Osceola, Nev.

Prof. Thos. Price has returned to San Francisco from a trip to Montana.

E. D. Boyle has been re-elected superintendent of the Alta, on the Comstock.

Geo. W. Grayson has returned to his home in Oakland from a visit to Tuscarora.

John F. Boyle is manager of the Lone Star mine, Humbug Creek, Siskiyou county.

Supt. McGowan of the Senator mine, Arizona, is expected back from the East shortly.

George Taylor has succeeded George Horn as foreman of the Hathaway mine at Ophir, Placer county.

Charles Derby has been appointed superintendent of the Lady Washington in place of E. D. Boyle.

A. B. Wood, the copper mine king of Michigan, arrived in this city on Saturday, from Detroit.

Capt. Owens is superintendent of the mines of the El Paso Mining Co. at Alamo, Lower California.

J. H. Gillinwater of this city has been up in the mountains examining a mine near Volcanoville.

The Owens gold mine near Julian, San Diego county, has been sold to H. A. Williams of Massillon, O., for $50,000.

Louis Klefeker has applied for a patent for the Summit mine, one of the original locations on Tioga hill, Tuolumne county.

W. M. Fox, president of the West Con. Virginia Mining Co., returned the past week from a short summer vacation in the country.

Frank Billings of Angels, Calaveras county, who sailed for the gold-fields of Africa some months ago, has arrived safely and is now in Cape Town.

Robert Floorman, with A. H. Harris and others of St. Louis, are at Galena, Dakota, examining the Surprise mine, Ruby Gulch, with a view to its purchase.

C. M. Donaldson is manager of the Eureka and Excelsior Co.'s mines at Cracker Creek, Oregon, where the new mill is being erected; 150 men are employed.

Senator Jones of Nevada and Lon Hamilton, superintendent of the Chollar, Potosi, and other Comstock mines, have returned here from Santa Monica and will go to Virginia City in a few days.

David Neagle, the U. S. Deputy Marshal, who shot and killed Judge Terry at Lathrop on Wednesday last, because of an assault on Judge Field, was formerly a mining man of Tombstone, A. T., where he took several contracts for shaft-sinking.

Mr. D. B. Huntley made us a brief visit this week. Mr. Huntley was a resident of Arizona for some years and afterward conducted mining operations in the U. S. of Colombia. He prefers California, however, and is now on the lookout for a good mining proposition in this State.

John Maxwell, formerly superintendent of the Overman mine on the Comstock and lately of the New Idria quicksilver mine, will have charge and direct operations of the Hyde mine, Tuolumne county. The mine has recently been purchased by San Francisco men and will now be operated vigorously.

Prof. Thos. Egleston of the Columbia School of Mines of New York, and author of "The Metallurgy of Silver, Gold, and Mercury in the United States," is on a visit to this coast. While here last summer he was investigating the subject of gold milling. This time he is examining smelting works, and has been through Colorado, New Mexico and Arizona. After staying a few days in San Francisco he goes to Oregon, Washington, Idaho and Montana.

Assessment Notices.

ASSESSMENT NOTICE.

California & Nevada Railroad Company.—Location of principal place of business, San Francisco, California. Location of Railroad, Alameda County, California.

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 3d day of August, 1889, an assessment, No 1, of Fifty Cents per share was levied upon the Capital Stock of the corporation, payable immediately in United States Gold Coin to the Secretary at the office of the Company, Room 12, No. 320 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 20th day of September, 1889, will be delinquent and advertised of sale at public auction, and unless payment is made before, will be sold on Monday, October 14th, 1889, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

E. A. PHELPS, Secretary.

Office, Room 12, No. 320 California Street, San Francisco, California.

ASSESSMENT NOTICE.

Gray Eagle Mining Company.—Location of Principal place of Business, San Francisco, California. Location of Works, Placer County, California.

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 13th day of August, 1889, an assessment, No. 14, of Four Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin, to the Secretary, at the office of the Company, 327 Pine Street, Room 9, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 16th day of September, 1889, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 8th day of October, 1889, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

O. H. BOGART, Secretary.

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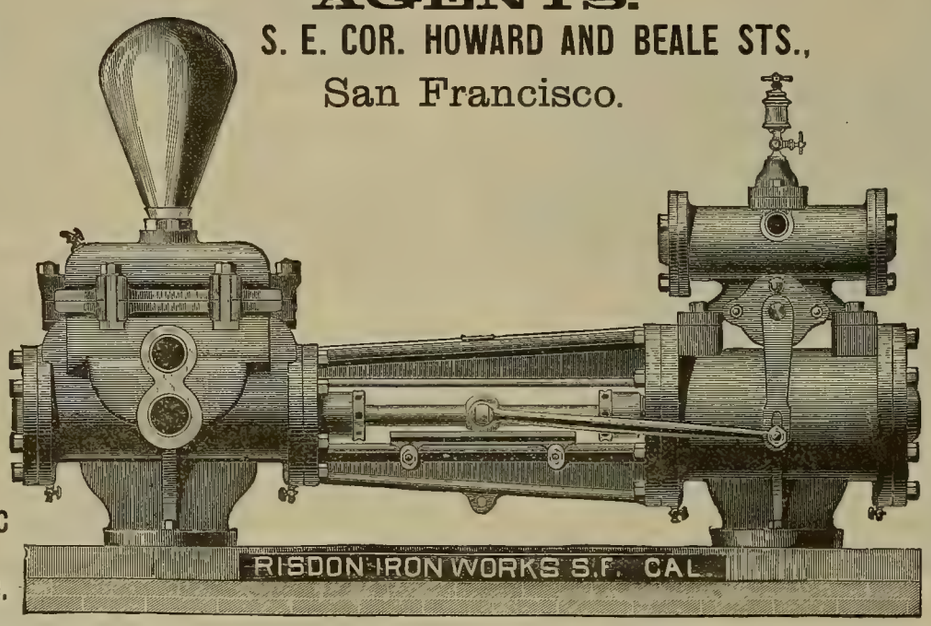
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Osceola, Nevada.

Smith & Drew took out Tuesday, in their dry wash diggings, in addition to 5 ozs. of fine gold, a nugget weighing 22 ozs. The machine used was Freeman's Dry Process Separator.—*Utah Daily Union, May 10, 1889.*

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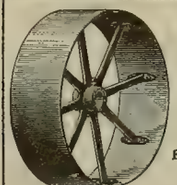
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MEDART PATENT WROUGHT RIM PULLEY

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SUSPENDED TRAMWAYS.

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These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

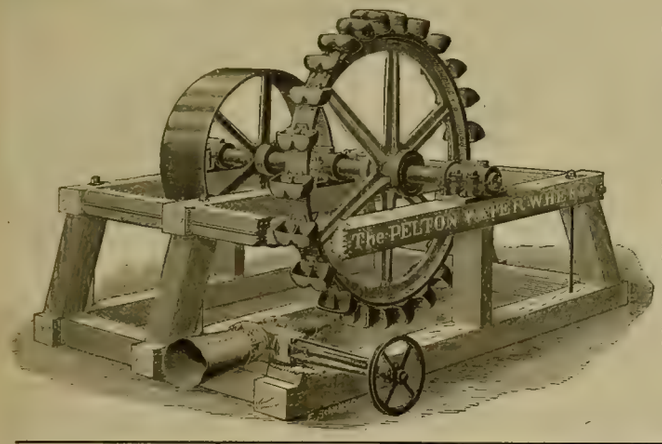
Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

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Springfield, Ohio, or 110 Liberty St., New York.

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Highest Efficiency of any Wheel in the World.

A MARVEL OF ENERGY AND POWER.

Over 600 in use on the Pacific Coast alone, aggregating upwards of 50,000 Horse Power.

It is not only most economical of water, but the most simple and reliable power for Quartz Mills, Compressors, Hoisting, Pumping, or any other purpose where water power can be used.

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Power from these Wheels can be transmitted long distances with small loss, and it is now being extensively used in this way in all parts of the country for producing both light and power.

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THE PELTON WATER WHEEL CO.,

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HENRY J. ROGERS & CO.

Successors to CHAS. CALLAHAN

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CAST and WROUGHT IRON SCRAP

SECOND-HAND BOILERS AND OLD MACHINERY

Of every description.

The Highest Price paid for all kinds of Metals.

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Iron cut, punched and formed, for making pipe on ground. All kinds of Tools supplied for making Pipe. Estimates given. Are prepared for coating all sizes of Pipe with a composition of Coal Tar and Asphaltum.

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(A Corporation.)

Constantly on hand a full assortment of Manila Rope, Sisal Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.

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Under Chamberlin Patent.

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We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price. Our New Illustrated Catalogue, with prices, will be sent on application.

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Ores worked by any Process.

Ores Sampled.

Assaying in all its Branches.

Analyses of Ores, Minerals, Waters, etc.

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For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass, Zinc and other metals punched for all uses.

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Aug. 22, 1889.

General trade continues fairly active. Iron-workers and manufacturers report a slight increase in their branches of business. Money is still easy in the local markets, for as yet very little is going out for crop purposes, as the demand is chiefly met by interior banks and capitalists. When the country demand does set in, it is claimed that there will, for a short time, be considerable friction felt here. While this may be so, yet it is not at all unlikely but the expected call will be fully discounted.

In the speculative markets there is nothing doing outside of wheat futures to excite attention from outside operators, although mining stocks have been more active.

Considerable interest centers in the coming bimetallic convention to be held at Paris in next month for the purpose of discussing the silver problem. There is more or less discussion why France continues to strengthen her gold reserve—whether it is for prudential, political or financial reasons.

MEXICAN DOLLARS—The demand is only fair. It is generally claimed that after next month freer shipments will be made by Chinese. Quotations throughout the week have ruled at from 73½ to 74 cts.

SILVER—The market has held steady at from 92⅝ to 92¾ cts bid, with an advance of from ⅛ to ¼ cts paid. One of the banks is receiving refined silver from Omaha. This, it is said, the institution is forced to, so as to obtain supplies to meet their requirements. As the price here is better than in New York, the silver sent from Omaha nets more money to the seller. It is claimed that the receipts here barely meet the demand. European advices report the market dull but firm.

Refined silver closed to-day at 92¾ to 92⅞c. Both New York and London are reported unchanged.

QUICKSILVER—Receipts the past week aggregate 433 flasks. The market is reported dull and inactive but fairly firm in sympathy with European advices. Exports by sea the past week were as follows: Central America, 1 flask; Mexico, 10 flasks.

BORAX—Receipts the past week aggregate 858 ctls., and the exports by sea 100 ctls. to Mexico; 19,442 ctls. to New York; 20,928 ctls. to St. Paul. By the Southern Pacific railroad the overland shipments in last month aggregated 2593 ctls. The market is steady but firm.

LIME—Receipts the past week aggregate 5309 barrels. The consumptive demand continues free, with at times some shading in prices reported.

TIN—Shipments by sea the past week were as follows: Pig to Victoria, B. C., 4037 lbs.; plate to Victoria, B. C., 27,000 lbs.; to Nanaimo, 1479 lbs. The market for spot is duller, but holders still quote at previous prices. For shipment there is quite an advance, owing to higher markets abroad and also ships asking more money for outward cargoes. The stock in England is larger than it was a year ago, while in the Eastern cities the consumption is less, owing to a lessened pack of fruit.

COPPER—Elsewhere in to-day's paper is an editorial on the present situation from a statistical standpoint. The market is firmly held, and as the consumption is gaining on the stock, it looks as if still better prices are likely to be obtained later on, or at least early in 1890.

LEAD—Four hundred and ninety pigs were received the past week from London. The market is reported fairly steady, with a firm tone.

IRON—The markets abroad and at the East are reported very strong at further advances. In this city the market is dull, with prices easy under liberal supplies and light consumption.

The following are the latest comparative quotations f. o. b. at Glasgow:

F. o. b. Glasgow.	Aug. 14, '89.	Aug. 7, '89.
No 1 Coltness	59s 6d	57s 6d
" Langloan	58s	56s 6d
" Summerlee	58s	57s 6d
" Gartsherrie	56s 6d	55s 6d
At Ardrossa.		
No. 1 Eglinton	47s 6d	46s 6d
" Glengarnock	54s 6d	54s
" Dalmellington	49s 6d	48s

COAL—Imports the past week were as follows: Coos Bay, 1220 tons; Seattle, 1870; Australian, 21,390; total, 24,480 tons. The market is reported firm, with $7 bid for Australian prompt shipment. The free arrival of Australian, although provided for, gives liberal supplies and tends to lessened present requirements. English coals are strongly held, owing to the high asking rates for charters. In coast coals a good consumptive call is reported. Many families and other consumers are said to be laying in their winter supplies. Receipts the past week were light, and it is expected they will only be fair the coming week.

Eastern Metal Markets.

By Telegraph.

NEW YORK, Aug. 21, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	42 5-16	92¼	$12 00	$3 87½	$20 30
Friday	42 5-16	92¼	12 00	3 92½	20 15
Saturday	42 5-16	92¼	12 00	3 90	20 20
Monday	42 5-16	92¼	12 00	3 90	20 15
Tuesday	42 5-16	92¼	12 00	3 90	20 15
Wednesday	42 5-16	92¼	12 00	3 90	20 30

NEW YORK, Aug. 21.—Quicksilver strong at 71@72c. Opium, from broker lots, $3.30. Borax steady at 9¼@9¾c; refined, 8¾@9c; powdered, 7¾@8⅛c; concentrated, 5oc. Fair business. Lake copper has maintained price, 12c; Montana and Arizona, 11½c; casting brands, 10¼c. Consumers bought liberally of the cheap grades. Electric wants of the world are strong governing factors. Pig Lead—Firm at $3.90; prompt, $4; near future delivery business moderate. Crude sperm more active than for previous half year. Sales of 1650 barrels in lots, many at 61c; New Bedford, $3.40; whale, 35c.

THE July cleanups of the Sierra Buttes and Young America mines of Sierra county were $13,000 and $22,000.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, August 22, 1889.

ANTIMONY	17 @	—
BORAX—Refined, in carload lots	7½@	7⅝
Powdered " " "	7½@	—
Concentrated " " "	—@	6¢
COPPER—		
Bolt	21 @	22
Sheathing	22 @	24
Ingot, jobbing	15 @	16
do, wholesale	13 @	14
Fire Box Sheets	22 @	24
LEAD—Pig	4½@	4¾
Bar	5 @	—
Sheet	7 @	—
Pipe	6 @	—
Shot, discount 10% on 500 bags	Drop, ₱ bag. 1 45 @	—
Buck, ₱ bag	1 65 @	—
Chilled, do	1 85 @	—
STEEL—English, lb	16 @	20
Canton tool	9 @	9¾
Black Diamond tool	9 @	9¾
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4¾@	—
TINPLATE—B. V., steel grade, 14x20, P. S.	4 80 @	—
B. V., steel grade, 14x20, spot	4 85 @	—
Charcoal, 14x20	6.25 @ 6 75	
do roofing, 14x20	5 12½@ 5 25	
Pig tin, spot, ₱ lb	21 @	21½
do, do, prompt shipment	@	—
QUICKSILVER—By the flask	47 50 @ 50 00	
Flasks, new	@	—
Flasks, old	37½ @	—

	Spot.	To Load.
IRON—Glengarnock ton	27 00 @ —	27½@ —
Eglinton, ton	26 00 @ —	26½@ —
American Soft, No, 1, ton	— @31 00	31½@ —
Oregon Pig, ton	— @30 00	— @ —
Clay Lane White	— @24 50	25 @ —
Shotts, No. 1	28 50 @29 00	— @ —
Bar Iron (base price) ₱ lb	2¾@ 3	— @ —
Chrome iron ore, ₱ ton	— @10 00	— @ —

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$19 00	$16 00
41 to 50 ft	20 00	17 00
51 to 60 ft	22 00	19 00
61 to 70 ft	26 00	22 00
1x3, fencing	21 00	18 00
1x4, "	20 00	17 00
1x3, 1x4 and 1x6, odd lengths	18 00	15 00
Sec. nd quality	16 00	14 00
Selected	23 00	21 00
Clear, except for flooring	30 00	27 00
Clear for flooring	1 00	.....
Clear V. G. No. 1 flooring	5 00	.....
Firewood	13 00	9 00
Dressed Pine, flooring, No. 1, 1x6	31 00	28 00
No. 1, 1x4	33 00	29 00
No. 1, 1¼x4, 1¼x6, and odd sizes	36 00	32 00
All sizes, No. 2	26 00	23 00
Stepping, No. 1	43 00	34 00
Stepping, No. 2	33 00	24 00
Ship timber and plank, rough	26 00	17 00
Selected, planed 1 side, average 40 ft	28 00	23 00
" " 2 " " " "	30 00	25 00
" " 3 " " " "	32 00	27 00
" " 4 " " " "	34 00	29 00
Deck plank, rough, average 35 ft	34 00	31 00
Dressed, average 35 feet	39 00	34 50
Pickets, rough, B. M	19 00	15 00
½x1½, 4 ft long, ₱ M	5 50	4 00

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	$ 7 00 @ 7½	Cardiff	50@10 00
Liverpool St'm	7 50 @ 7 75	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	8 00 @ 8 50	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Gilman	6 00
Scotch Splint	9 00	Seattle	6 00
West Hartley	11 00	Coos Bay	5 00
Greta	8 00	Cannel	10 00
Westminster Brymbo	9 00	Egg, hard	17 50
Nanaimo	9 00	Cumberland, in sacks	19 00
Sydney	8 00	do, bulk	18 00
Jackson	6 00		

COKE—Eng., ton, spot, in blk & sks, resptvly | 17 00 @20 00
Do, do, to load | 13 00 @13 25

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, department 10, San Francisco:

NATIONAL AUTOMATIC DEVICE CO., Aug. 16. Capital stock, $1,000,000. Directors—P. W. Clark, P. L. Weaver, T. B. Berry, Walter A. Clark and J. S. Bailey.

LEADER PUBLISHING CO., Aug. 19. Capital stock. $10,000. Directors—J. Hendon Garnett, C. W. Dearborn, C. H. Hobart, Wm. P. Todd and H. F. Norris.

SAN FRANCISCO, TAMALPAIS & BOLINAS R. R. CO., Aug. 20. Object, to establish a ferry between San Francisco and Sausalito; to construct a railroad between Sausalito and a point at the base of Mt. Tamalpais, and between Sausalito and Bolinas bay. Directors—Harry L. Coleman, Frank P. Bacon, Thos. Brown, Chas. Page and Wm. F. Russell. Capital stock, $500,000.

FRESNO DEVELOPMENT AND PLANTING CO., Aug. 20. Directors—N. J. Bird, Robert Husband, W. W. Broughton, G. W. Darborn and Geo. T. Prescott. Capital stock, $100,000.

CONSOLIDATED GOLDEN GATE SULPHURET MINING AND DEVELOPMENT CO., Aug. 20. Capital stock, $6,000,000. Directors—J. A. Fischer, E. C. Loftus, Charles J. Behlow, Benjamin F. Fischer and W. G. Long.

GOLD MOUNTAIN AND DRY GULCH CONS. M. CO., Aug. 20. Location, Oregon. Capital stock, $2,000,000. Directors—R. B. Cannon, R. H. Miller, A. W. McPherson, Ed. H. Fleming and F. E. Austin.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

AT the last meeting of the California Academy of Sciences, Fr. Gutzkow read a paper on "Aluminum as a Metal." He demonstrated that the present methods of reducing the metal were too expensive to cause its general use.

MINING SHAREHOLDERS' DIRECTORY.

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ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'NT. SALE.	SECRETARY.	PLACE OF BUSINESS
Argenta M Co	Nevada	19	10	July 20	Aug 21	Sept 16 E M Hall 314 Montgomery St
Alpha Con M Co	Nevada	3	25	July 15	Aug 22	Sept 12 C E Elliott 309 Montgomery St
Baltimore M Co	Nevada	5	25	July 2	Aug 5	Aug 24 A R Grim 401 Montgomery St
Baker Divide M Co	California	17	25	July 8	Aug 15	Aug 28 D M Kent 330 Pine St
Bulwer Con M Co	California	6	25	Aug 6	Sept 12	Oct 10 L Osborn 309 Montgomery St
Calaveras Blue Gravel M Co	Cal	3	3	Aug 3	Sept 16	Oct 2 B Burris 240 Montgomery St
Challenge Con M Co	Nevada	5	50	Aug 6	Sept 9	Sept 30 C L McCoy 329 Pine St
Chollar M Co	Nevada	27	50	July 15	Aug 20	Sept 10 C E Elliott 309 Montgomery St
Con New York M Co	Nevada	1	25	Aug 14	Sept 18	Oct 9 C E Elliott 309 Montgomery St
Crown Point M Co	Nevada	51	50	July 9	Aug 12	Sept 2 J Newlands 329 Pine St
East Mt Diablo M Co	California	5	10	July 18	Aug 22	Sept 16 R W Heath 318 Pine St
East Sierra Nevada M Co	Nevada	1	10	Aug 8	Sept 13	Oct 7 G R Spinney 310 Pine St
Gray Eagle M Co	California	14	4	Aug 13	Sept 16	Oct 8 O H Bogart 317 Pine St
Golden Fleece G'd M Co	California	14	17 00	May 21	July 20	Sept 16 W J Gleason 806 Market St
Grand Prize M Co	Nevada	21	30	July 27	Aug 30	Sept 20 R R Grayson 327 Pine St
Kentuck M Co	Nevada	19	30	July 30	Sept 2	Sept 20 J W Few 310 Pine St
Mexican M Co	Nevada	38	25	July 9	Aug 13	Sept 3 C E Elliott 309 Montgomery St
Mono M Co	California	28	50	July 24	Aug 28	Oct 1 B L Burling 309 Montgomery St
Overman S M Co	Nevada	60	25	July 27	Aug 30	Sept 20 G D Edwards 414 California St
Palesade S M Co	Nevada	1	10	Aug 6	Sept 16	Oct 2 D Buck 309 Montgomery St
Savage M Co	Nevada	73	50	July 19	Aug 21	Sept 10 E B Holmes 309 Montgomery St
Scorpion M Co	Nevada	1	10	Aug 8	Sept 13	Oct 7 G R Spinney 310 Pine St
Southern Cal Coal & Clay Co	Cal	2	10	30	Aug 16	Sept 16 Oct 16 W G Mugan 10 California St
Utah Con M Co	Nevada	7	25	July 9	Aug 13	Aug 30 A H Fish 309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING	DATE
Chicago M & M	Nevada	Wm Grant	520 Montgomery St	Annual	Sept 3
Gover M Co		Gray Drew	13 & 15 Fremont St	Special	Sept 4
Hector M Co		J B Hughes	517 Clay St	Annual	Sept 9

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Caledonia M C	Nevada	A S Cheminant	328 Montgomery St	08	Aug 5
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	July 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	July 25
Idaho M Co	California		Grass Valley	7.50	May 5
Navajo M Co	California	J W Few	310 Pine St	10	Apr 1
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Aug 10

Mining Share Market.

Mining stocks the past week gravitated, with slight fluctuations, to lower figures for the Comstocks, and this, too, in the face of the action of those reported shrewd operators, Finlay and Spring, in trying to build up confidence in the market with the "mudhens" and "gutter-snipes" through the *Post* and *Report*, so it is claimed, to promote a bull movement. The crawfishing so far of the market is, no doubt, a source of surprise to many patrons of the two papers, yet they must have confidence in their journalists' ultimate success when combined with Senator Jones' anticipated visit to Virginia City. Outside of the few chronic bulls on Pine street and "Pauper alley," the large proportion of outside dealers have little faith in the market, believing that the time is not ripe for much of a move. There is a growing impression in certain quarters that quite a line of small shorts is on the market, and in consequence a spurt in stocks may take place any day so as to make the smaller operators fill. Attention is still being attracted to the North End mines, but experienced miners are confident that the best results are to be obtained in the Gold Hill and Middle mines. In the outside stocks, the Quijotoas and Bodies have been fairly steady under light trading, while the Tuscaroras shaded off some. In Eureka and Silver King nothing has been done.

From the mines there is nothing of importance in an official way from the Comstocks, yet private advices are indicative of large and extensive deadwork going on in the Gold Hill mines, which has for its object the opening up of several levels running from Yellow Jacket and south to Bullion, and farther north, even as far north as Savage. The 500-foot north drift from the Yellow Jacket shaft is about 375 feet in Con. Imperial ground. The work in this drift, it is said, will be prosecuted until connection is made with the 800-foot level in Alpha. The Alpha shaft is to be sunk 100 feet deeper, when a west crosscut will be started to cut the west ledge found on the 500-foot level, mention of which was made last week.

The drift in the 700-foot level in Potosi is within a few feet of the Bullion. In running this drift, they passed through a body of white quartz from 35 to 40 feet wide, giving low assays. This drift will be run to form a connection with a west drift from the 800-foot level from the Ward shaft. This will also connect with the 500-foot drift from the Yellow Jacket shaft, which will give excellent ventilation through several mines. The 1000-foot drift has been connected through the different mines from Crown Point to Overman. The winze from Seg. Belcher and Belcher has been connected with the 1300-foot level, which gives the best of ventilation so as to prospect from the Sutro tunnel level the rich ground in Crown Point, Belcher and Seg. Belcher. The west crosscut on the 500-foot level of Yellow Jacket, it is claimed, is being pushed ahead so as to cut a rich gold ledge lying to the west. It is claimed that all differences between the middle grop of mines, Alpha, Bullion and other Gold Hill mines, have been amicably settled and work in two or three of the mines can by the new arrangements be better prosecuted. Of necessity, the work outlined by the various companies means time and an expenditure of considerable money. Quijotoa advices are more hopeful, yet not much result is looked for from them before November. Well-known and reliable mining men are very hopeful of the Tuscarora mines. They say that several of them are rich in mineral and that it is only a question of a short time when they will be worked more advantageously. Official advices from Bodie and Mono report the cutting, in each mine, of a streak of rich ore. This is more cheering than rich bowlders, but it would have been much better if the width and assay value had been given. Our advices are still of a very hopeful character.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. C. HOAG—San Francisco.
R. G. BAILEY—San Francisco.
W. W. THEOBALDS—Central California.
GEO. WILSON—Sacramento Co.
E. H. SCHAEFFLE—Calaveras Co.
DR. W. F. DRAKE—Sonora, Cal.
A. F. JEWETT—Tulare Co.
ROBERT M. MAPPES—Fresno Co.
E. L. RICHARDS—San Diego Co.
WM. WILKINSON—San Joaquin Co.
JULES BAUMANN—Arizona.
FRANK S. CHAPIN—Nevada.
CHAS. F. BLACKBURN—Idaho.
L. H. WILSON—Oregon.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 31.		WEEK ENDING Aug. 7		WEEK ENDING Aug. 14.		WEEK ENDING Aug. 21.	
Alpha	.95	1.10	1.75	1.00	.75	1.15	1.15	1.35
Alta	1.25	1.30	1.30	1.30	1.30	1.40	1.30	1.45
Andes	.60	.65	.50	.60	.55	.70	65	.75
Argenta	....	....	....	....	....	....	....	....
Belcher	2 35	2.85	2.15	2.55	2.20	3.05	2.75	2.95
Best & Belcher	3.10	3.60	2.70	3.15	3 00	4.00	3.40	3.80
Bullion	.80	.85	.40	.60	.50	.75	.55	.70
Baltimore	.05	....	....	....	....	....	.30	....
Belle Isle	.25	....	.15	.20	....	....	....	....
Bodie Con	1 05	1.15	.70	1.00	.80	.90	.85	.95
Benton	4 50	....	....	....	....	....	....	....
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.30	....	.15	.20	.10	.15	.10	.15
Commonwealth	3.95	4.10	3.05	4.00	2.45	3.25	2.50	2 60
Con. Va. & Cal	6¾	7¾	6¾	7¾	7⅛	7¾	7¼	7¾
Challenge	1.75	2.05	1.50	1 8	1.45	2.20	1.80	2.15
Chollar	1.35	1.50	.10	1.35	1.30	1.50	1.80	2.10
Confidence	5.50	....	5¾	5¾	6¼	6	6	7
Con. Imperial	.40	.50	.35	.45	.35	.55	.50	.55
Caledonia	.20	....	.15	....	.15	.20	.20	....
Con. Pacific	....	....	....	....	....	....	.40	....
Crown Point	2.00	2.20	1.70	2.10	1.75	2.55	2.70	3.20
Crocker	.35	....	.30	.35	.35	.40	.40	....
Central	....	....	....	....	....	....	....	....
Dudley	....	....	....	....	....	....	....	....
East B. & B	....	....	....	....	....	....	....	....
Eureka Con	1.35	....	....	1.50	....	....	1.35	1.50
Exchequer	.60	.65	.50	.60	.50	.70	.65	.70
Grand Prize	.60	....	.35	.45	.40	....	.35	.45
Gould & Curry	1 80	2.10	1.60	1.90	1 70	2.25	1.95	2.10
Hale & Norcross	2.75	3.00	....	....	2.70	3.10	2.90	3.15
Holmes	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Iowa	....	....	....	....	....	....	....	....
Julia	.30	....	.20	.30	.20	.25	.25	....
Justice	1.55	1 80	1.30	1.55	1.40	1.60	1.45	1.60
Kentuck	....	....	....	....	.70	1.00	.95	....
Lady Wash	.40	....	....	....	....	....	.35	....
Locomotive	....	....	....	....	....	....	.10	....
Martin White	....	....	....	....	....	....	....	....
Mono	.60	.70	.50	....	.50	.55	.35	.60
Mexican	2.50	2.95	2.15	2 60	2.30	3.45	3.15	3.60
Mt. Diablo	....	....	....	....	....	....	....	....
Navajo	....	....	.40	....	....	....	.25	.30
North Belle Isle	.95	1.30	1.00	1.25	.90	1.10	.80	.85
Niagara	....	....	....	....	....	....	....	....
Nev. Queen	1.25	1.30	1.00	1.30	.85	1 00	.80	.90
North G. & C	....	....	....	....	....	....	....	....
Occidental	2.00	2.20	1.85	2.10	1.90	1.95	1.80	1.95
Ophir	4.25	4.65	3.75	4.20	4.10	5.25	4.75	5¼
Overman	.75	.90	65	.75	.60	.90	.75	.90
Potosi	1.40	1.55	1.20	1.40	1.25	1.65	1.50	1.70
Peerless	.30	.35	.25	.30	.25	.40	.25	.35
Pecr	....	....	.10	.15	.10	.20	.15	.20
P. Sheridan	....	....	....	....	....	....	....	....
Silver Star	....	....	....	....	....	....	....	....
Savage	1.35	1.65	1.15	1.40	1 25	1.75	1.50	1.80
S. B. & M	1.60	1.85	1.40	1 65	1.40	1.75	1.65	1 90
Sierra Nevada	2.00	2.30	1.95	2.15	2.00	2.70	2.50	2.80
Silver Hill	.40	.55	.35	.40	.10	.45	.40	.50
Silver King	.85	....	....	....	....	....	....	....
Scorpion	....	....	....	....	....	....	....	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	....	....	....	....
Union Con	2 60	2.95	2.20	2.60	2.45	3.15	3.00	3.30
Utah	.65	.75	.55	.70	.50	1 10	.95	1.10
Yellow Jacket	2.50	2.50	2.20	2.65	2.35	3.30	3 00	3.30
	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY, Aug. 22, 9:30 A. M.

500	Bulwer	420	Mexican 3 45
250	Bullion 25c	100	Mono 55c
100	Belcher 2.90	200	Navajo 25
50	Chollar 1.95	100	Ophir 4 85
100	Crown Point 2.80	150	Overman 7c
200	Con. Imperial 50c	50	Potosi 1.50
100	Con Va & Cal 7.75	150	Utah 1.05
300	Gould & Curry 2.00	150	Union 3 20
50	Grand Prize 35c	250	W Comstock 50c
50	Hale & Nor 2.95	100	Weldon 25c
100	Justice 1.35	50	Yellow Jacket 3.0

ELECTRICAL SOCIETY.—At the last meeting of the Electrical Society, the members listened to the demonstration and reading of an article lately published by Patrick Delaney of New York, on "Cable Telegraphy and the Delaney Line Adjuster," an invention by which long currents can be conveyed by sound, and at a speed two to three times greater than the one in common use. The demonstration was made by Prof. Keith by means of a blackboard, and was attentively followed by the members who were present.

Successful Patent Solicitors.

As Dewey & Co. have been in the patent soliciting business on this Coast now for so many years, the firm's name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific Coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this Coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That this is understood and appreciated, is evidenced by the number of patents issued through their SCIENTIFIC PRESS Patent Agency (S. F.) from week to week and year to year.

Pressed Brick and Terra-Cotta.

A company has been organized in this city under the name of the Union Pressed Brick and Terra-Cotta Company, with Mr. J. H. Wise, ex-Harbor Commissioner, as president, and C. S. Preble, secretary. The directors are: J. H. Wise, C. H. Frost, O. E. Moore, H. T. Scott, T. H. Downing, S. G. Hilborn and W. Z. Price. The works, which are on an extensive scale, are located at Vallejo, where the company owns an inexhaustible body of very fine clay peculiarly adapted to their purposes. From 50 to 100 men will be employed, and about 24,000 brick per day can be turned out. Terra-cotta from the same material and in all designs will be manufactured to order.

The company make use of a peculiar and rapid dry process. Within three minutes from the time the clay enters the machine the bricks are ready for the kiln. The pressure employed in molding is enormous and leaves the brick before burning nearly as hard as the burnt brick made in the old way. Quite a variety of color can be produced—Indian red, dark brown, bright yellow, etc.—and the finished product is very handsome, smooth as polished granite and as hard. They will sustain immense crushing force and are also fireproof. Architects and those who contemplate building are invited to visit the company's office, room 31, in the Flood building, and inspect samples.

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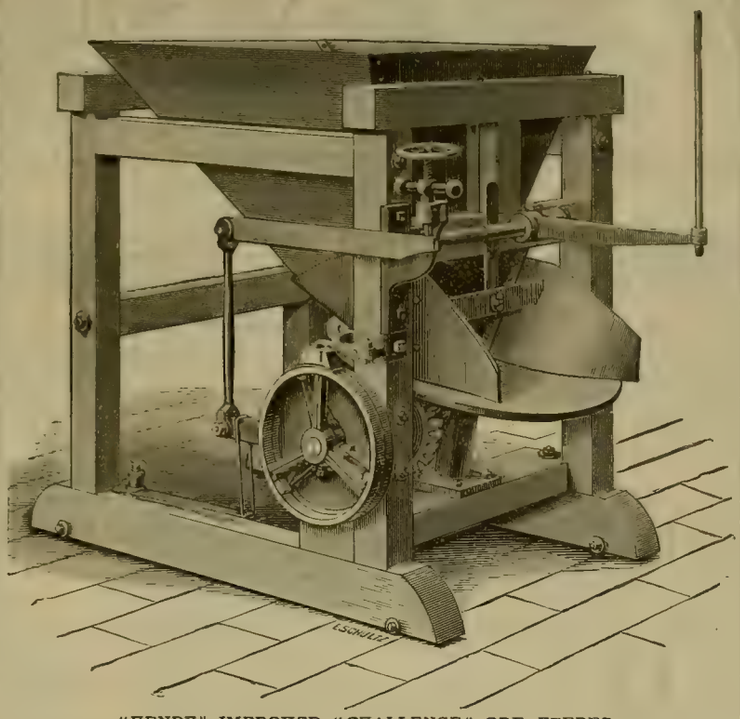
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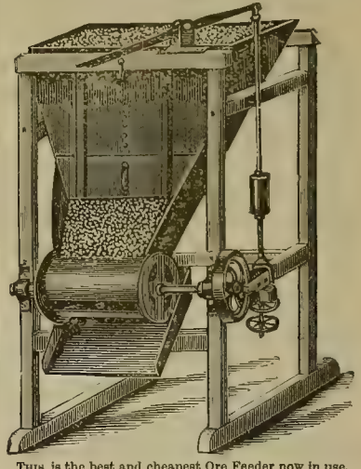
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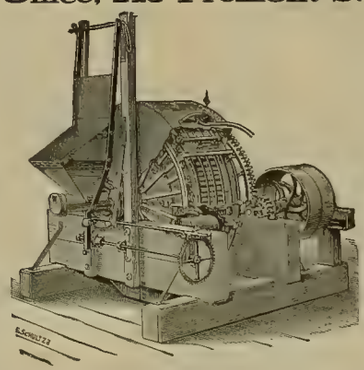
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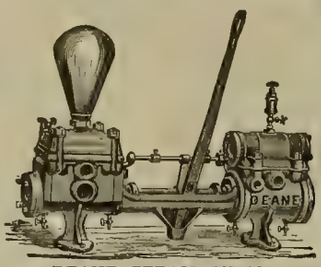
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COAL MINES OF THE WESTERN COAST.

A few copies of this work, the only one ever published treating of Pacific Coast Coal Mining, have been obtained, and are for sale at this office for $2.50 per copy. It was written by W. A. Goodyear, Mining and Civil Engineer, formerly of the California State Geological Survey.

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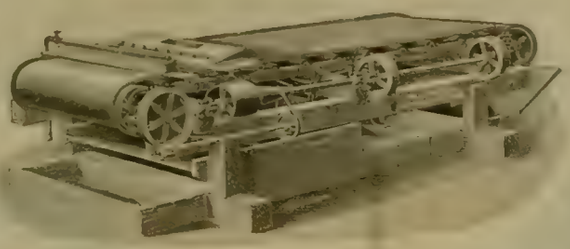
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There are Over 2200 Plain Belt Machines now in Use.

THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

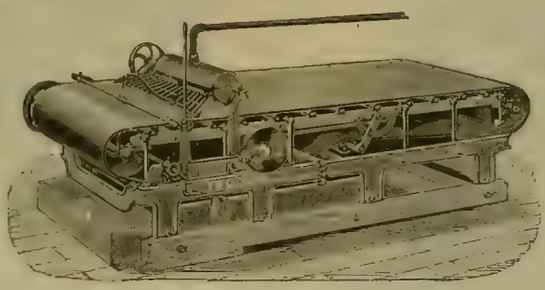
ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., Room 15, No. 132 Market Street, San Francisco, Cal.

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The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

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We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need be.
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Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

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GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vann or concentrating devices. DAVID MCKAY, JR.,
[Signed] Sup't North Star and Original Empire Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

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1850. 1888.

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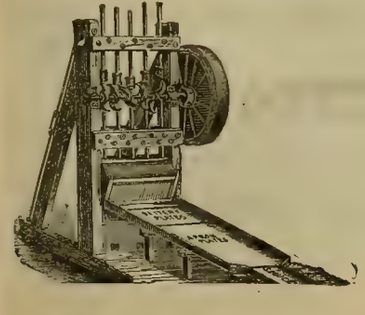
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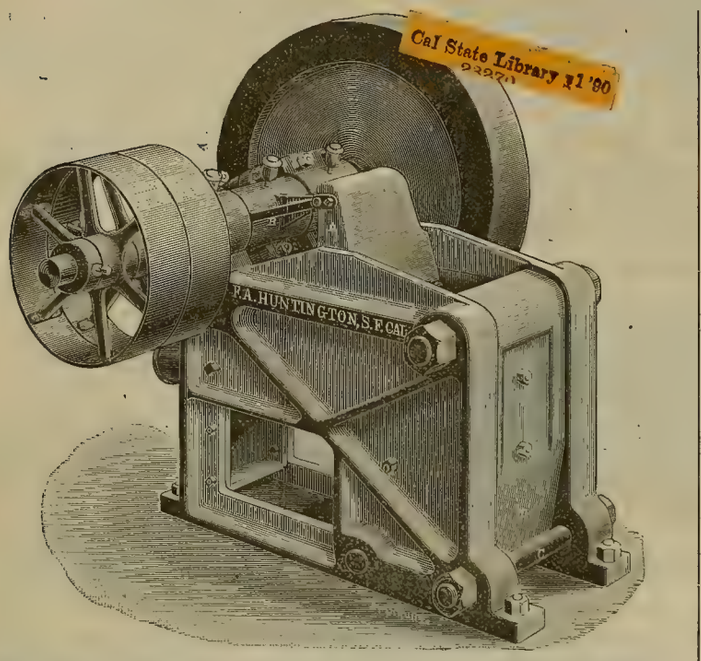
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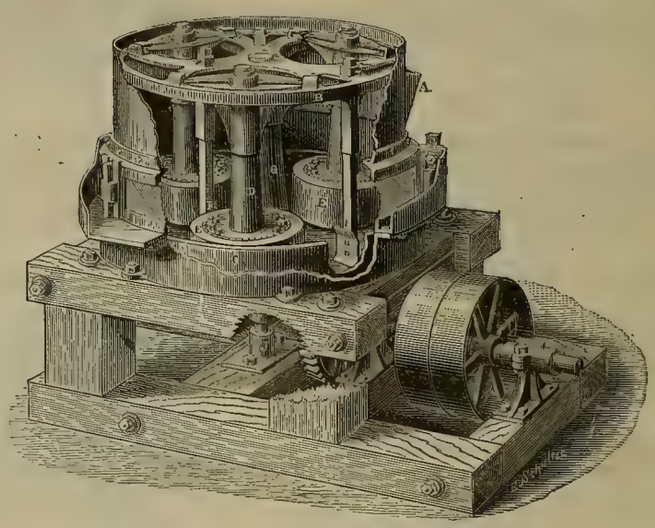


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Huntington's Improved Rock-Breaker.

The main features of this machine are strength, ease of adjustment and simplicity of construction.

The movable jaw *A* is worked by the eccentric *B* and is pivoted at the bottom. The stationary jaw *D* is secured at the top by a bolt running through it, and at the bottom bears against the heavy bolt *C*. The main wear is, of course, at the bottom of a breaker of this form, and the wear is easily taken up by inserting a plate between the bolt *C* and the jaw *D*. The jaw is thus swung in at the bottom, and the opening where the ore passes through is made correspondingly smaller. As will be seen by the cut, this machine is of very simple construction and is strong and durable.



F. A. HUNTINGTON'S
Centrifugal Roller Quartz Mill.

The following will explain the above cut:

The ore and water being fed into the mill at the hopper *A*, the rotating rollers and scrapers throw the ore against the ring die, where it is crushed to any desired fineness by the centrifugal force of the rollers as they roll over it.

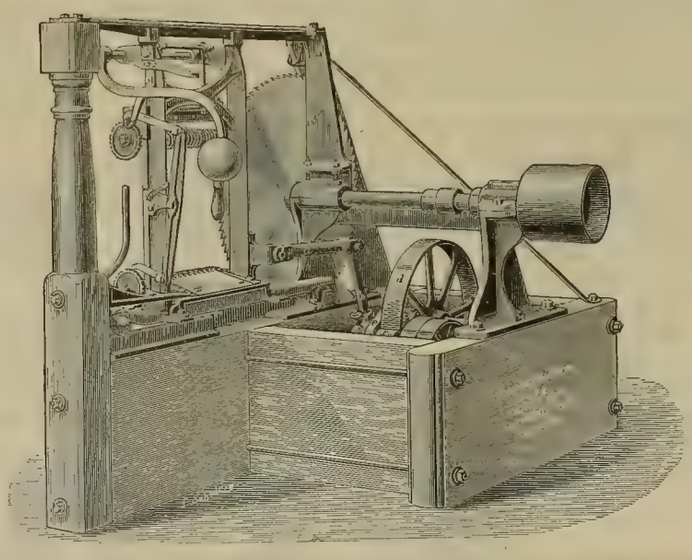
The water and pulverized ore are thrown against and through the screens when fine enough. The discharge is so perfect that it makes little or no slimes, and leaves the pulp in good condition for concentration. The rollers are suspended, leaving a space of one inch between them and the bottom of the mill, thus allowing them to pass freely over the quicksilver and amalgam without grinding it or throwing it from the mill, while it agitates it sufficiently to make amalgamation perfect. For wet crushing and gold saving it has no equal.

I claim especial merit in that feature of this system *which prevents* ALL FLOURING of gold and quicksilver, and the consequent loss of gold that attends stamp milling.

For the economical working of ore that contains sulphurets, I particularly claim the adaption of this mill. The rotary method of crushing the ore so granulates the pulp (which is discharged the moment it is crushed) that a complete concentration of sulphurets is rendered most easy.

F. A. HUNTINGTON'S
PATENT SHINGLE MACHINE.

This Machine is so well and favorably known by all the principal Lumbermen on the Pacific Coast that it is useless to go into any detailed account of its merits; suffice it to say that recent improvements in a new, quick return feed-works has placed it far ahead of all competitors. This feed-works is positive and uniform in its action and obviates all the jar or tremor formerly given to the machine by the weight used in the old style feed.



For simplicity, durability and rapidity of action, these machines have no equal, cutting from 50,000 to 75,500 shingles per day.

Price, complete with Jointer and one 38-inch Saw, $475.00.

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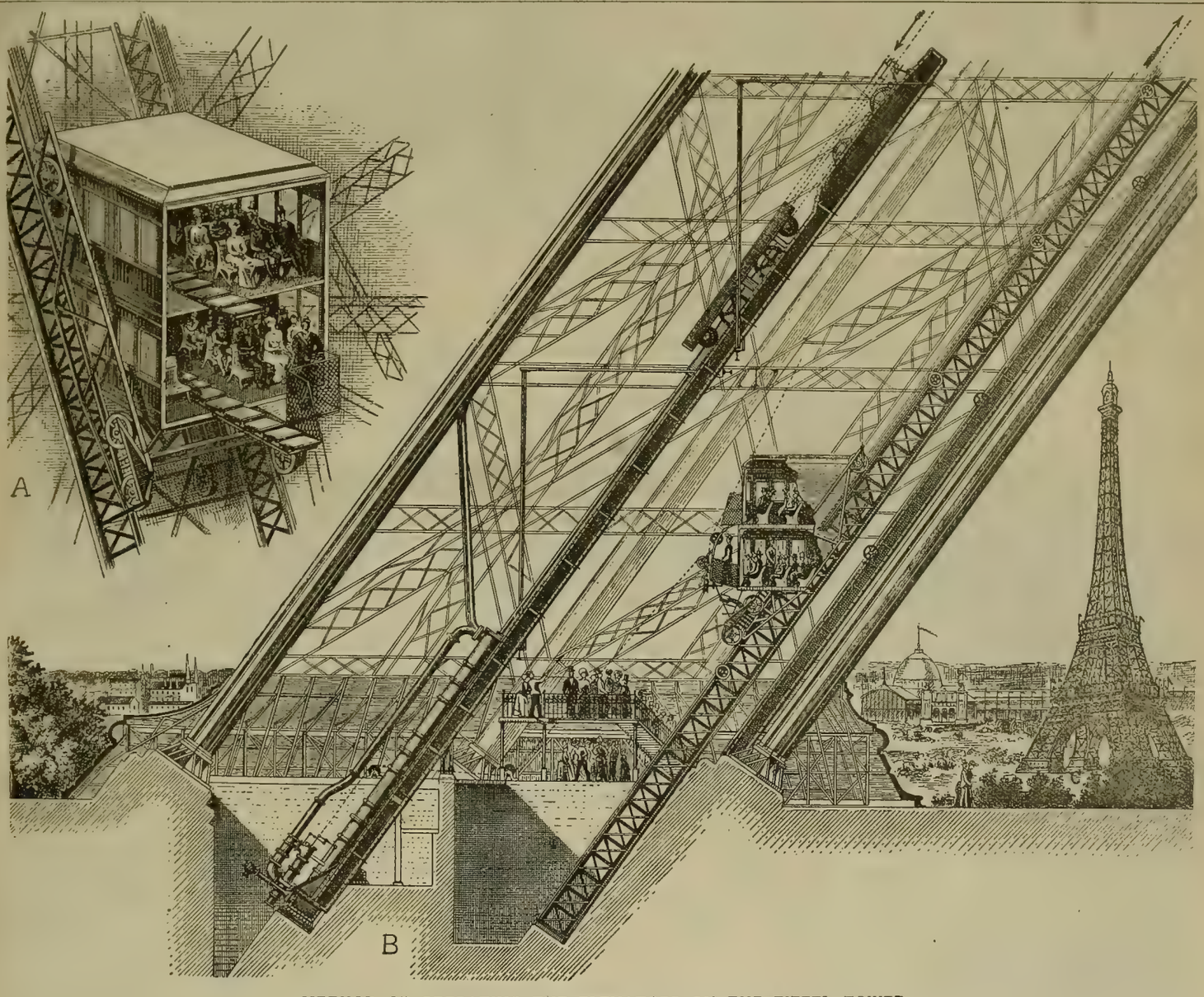
An Illustrated Journal of Mining, Popular Science and General News.

TWENTY-PAGE EDITION.

VOL. LIX.—Number 9.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, AUGUST 31, 1889.

Three Dollars per Annum
Single Copies, 10 Cts.



METHOD OF OPERATING THE ELEVATORS ON THE EIFFEL TOWER.

The Elevators of the Eiffel Tower.

Their Construction and Operation.

When it became a question of elevating visitors from the second platform to the summit of the Eiffel tower, at the Paris Exposition, seven commissioners were appointed, who, after mature examination, decided to adopt the plan of M. Edoux, which combined all the advantages of others proposed without their inconveniences, a specimen of which had been in operation for ten years at the Trocadero without an accident.

The usual apparatus of M. Edoux consists essentially in a metallic piston, the hight of which is the distance to be traversed, moving in a vertical cylinder and bearing at its upper part the car or cabin for passengers, and kept in equilibrium by counter-balance-weights properly calculated and disposed. This system could not, however, be applied in its ordinary form to the tower, because of the imposed condition that none of the means destined for the working of the apparatus should go below the second floor.

M. Edoux got over the difficulty in a very ingenious manner without changing, so to say, anything typical in his apparatus. The vertical distance to be traversed, comprised between the second story and the summit of the tower, is 160m.40; now let us suppose it divided into two parts of 80m.20 each, and let us fix in thought a floor intermediate at this level. Considering this floor as the point of departure of an ordinary elevator, this last could traverse all the part above, to the summit of the tower, while its counter-weights, of which the point of departure would be the same floor, would go from the latter to the second story.

If now we replace these counter-weights by a cabin or cage, we easily see that we will be able to traverse in this way all the hight of the 160m.40. Such, in its great lines, is this remarkable project, which resolves a problem absolutely new, in employing principles long established and sanctioned by several years of practice. The metallic *ossature* is formed by a *poutre-caisson* in the center of the tower, of the hight of 160m.40, and by two other *poutres* of smaller section, one extending from the second story to the intermediate floor and the other from this last floor to the summit of the tower. These several *poutres* are united by cross-pieces to the metallic walls, and are designed to support the guides of the car or cage. One of these cars, designated by the letter *A*, in the engravings, rests upon two pistons of hydraulic press, giving to both a section of 1600 square centimeters. These pistons are articulated at their upper part, on a *palonnier*, the center of which supports the cabin. The latter ascends without concussions, not being influenced by the variations of speed of the pistons. These variations, moreover, are hardly appreciable, since they can only result from the friction of the packing of the pistons. Four cables go from the cage, *A*, and from the

(*Continued on page 163.*)

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

The Northern Counties of California.

[NUMBER 10.]

Metals and Minerals of Economic Value.

[Written for the PRESS by JAMES H. CROSSMAN.]

For a description of California's carbonaceous and hydro-carbonaceous minerals and their volatile products we refer our readers to the 7th annual report of our State Mineralogist, Wm. Irelan, Jr., which contains a valuable treatise on petroleum, asphaltum, natural gas, and the coal of our State, by Adolph H. Weber and W. A. Goodyear, assistants in the field during the summer and autumn of 1887.

Scientists differ widely as to whether natural gas will be found in sufficient quantities in any part of California to become of economic value, owing to the rocky formation having been by dynamic influences crushed, fractured, faulted, and the strata, as a rule, upturned on their edges at varying angles, permitting the larger portion of oil and volatile gas that had been generated and confined in subterranean reservoirs to escape through fissures and interstices of the rocky formation during the period that these changes took place, or subsequent to that time.

Natural Gas.

But we should bear in mind that Prof. Whitney, our State Geologist from 1866 to 1868, after a careful examination of the hydro-carboniferous formation of our southern counties that are now producing so largely, was emphatic in his statements that petroleum (natural gas as a fuel and illuminant not then known) could not be found in California in paying quantities, owing to precisely the same reason and with the same line of argument. At this date its production has become an important industry and has added largely to California's prosperity, rendering us, in a measure, independent of the foreign product. The learned professor was evidently at fault in his geological deductions, as the statistics of California's production of oil for the past nine years stand as follows:

Year.	Gallons.
1879	568,806
1880	1,763,215
1881	4 194,102
1882	5,462,671
1883	6,000,000
1884	6 000.000
1885	8,760,000
1886	10,950,000
1887	28,500,000
1888	27,000,000
Total	99,138,794

In fact, such has been the development in the past year that many think that we have as large resources as Pennsylvania. It should be borne in mind that Mendocino and Humboldt counties are possessed of more than 40 square miles of superficial area that contain these hydrocarbonaceous products (petroleum, asphaltum and natural gas). These fields are comparatively virgin and require not only capital but practical experience to develop them. The little that has been done has been merely surface scratching, particularly when we take into consideration that in order to get a flow of natural gas in the Westinghouse well at Pittsburg, Pa., it was found necessary to sink to a depth of 4618 feet, which was 2000 feet below the level of the sea. Other deep wells in New York and Pennsylvania vary from 3000 to 4000 feet in depth before an abundant flow is obtained. It is this new fuel that gives new vigor and life, pith and moment to Eastern manufactures. Why should California be behind in the race? We have the material; let us utilize it.

At this date all that our State requires to make her thoroughly self-supporting and independent of the world, and one of its great manufacturing centers, is cheap fuel. If we can find natural gas in sufficient quantities, the problem is solved. We have iron, copper, lead, antimony, arsenic, zinc and sulphur for our smelters, foundries and reduction works in unlimited quantities; virgin forests of pines, oaks and other varieties of woods, with superior qualities of marbles, granites, sandstones, lime, clay, etc., for structural purposes.

With this new fuel we can successfully treat our base metal ores at home, thereby saving the heavy expense of transportation and foreign reduction. We can build ships and railroads with domestic iron and compete with the most favored nations in that industry. Though natural gas has been known to exist in our State in considerable quantities, it has not as yet been utilized to any extent.

Where Gas Has Been Found.

In Sonoma county a well has recently been bored in which a regular flow of natural gas has been struck yielding 4,000,000 cubic feet, which is allowed to run to waste. This, if utilized, would prove a "treasure-trove" to the owner of the well and of great value to our manufactories. In the vicinity of Stockton, in San Joaquin county, there are several wells, one of which has reached a depth in excess of 3000 feet. From these wells the flow of gas is sufficient to warrant its introduction as an illuminant in that city in place of gas. It is also being used in furnaces for steam purposes in place of coal.

Antimony, Arsenic and Zinc.

A well-defined vein of antimonial ore assaying 20 per cent and from 8 to 30 inches wide occurs near Dunsmuir, Siskiyou county, in the Humbug mining district. It also occurs in combination with arsenic and zinc, forming the bases of the auriferous ores of that locality; also in Modoc and Del Norte counties. But neither of these bases are in sufficient quantities to warrant treatment of the ores for those metals alone.

Basalt and Trap

Occur in immense quantities in the southeast portion of Siskiyou county, where the latter is used for structural purposes by the Oregon & California railroad, and also for culverts and the abutments for their numerous bridges. These minerals have a columnar structure and readily fracture at right angles with the face. They are of great strength and impervious to fire. They are also abundant in Modoc county.

Clay

Of a superior quality for fire-brick and pottery purposes abounds in these five northern counties. In Modoc county a bed of kaolin (porcelain clay) has been discovered near Hot Spring valley.

Calcite

Of good quality, free from foreign substances, is found in large quantities near the Oregon & California railroad, five miles from Yreka, Siskiyou county, suitable for lime.

Coal.

A bed of lignite occurs on Anderson's ranch, in Shasta valley, Siskiyou county; extent and value undetermined; also in Modoc, Mendocino and Humboldt counties. In the latter county a bed of bituminous coal 4 feet thick, of a superior quality, has been discovered on the Ray ranch, Tp. 4, S. R. 4 E. meridian. It is stated that this coal cokes well. It has also been found in a number of other localities in both Mendocino and Humboldt counties; formation sandstone.

Copper.

The ores of this metal are found on Humbug creek, Siskiyou county, in place; also on Slide creek. The croppings are traceable on the surface for more than three miles. At Callahan's ranch copper occurs in a metallic form with the alluvions; also at Bissel Bar, Humbug gulch and on the north fork of the Salmon river, at Altaville, Del Norte county, and in Mendocino, in Coyote, Potter and Walkers valleys, and in Surprise valley of Modoc county as well. In every instance the occurrence is so remote from tidewater and railroad facilities that no developments have been made.

Galena

Is found in Scotts valley in veins and extensive caves that occur in the Limestone range near McBride's ranch. This galena carries but a small percentage of silver.

Iron.

The northern counties of California are especially noted for extensive beds and deposits of chromic iron ore containing an unusually high percentage of chromic acid, particularly the beds in Del Norte county, near Altaville, and near the Forest house in Siskiyou county. The latter ore contains 60 per cent of chromic acid. It is found as float in huge blocks, but for want of a market, it never has been utilized or traced to its source. It is also found in Shasta valley, near Anderson ranch. These ore bodies invariably occur in serpentine. Beds of hematite are occasionally seen, but are not extensive. The largest bed is situated three miles from Dunsmuir.

In Humboldt county nature's concentrations of the beach sands are largely composed of auriferous and magnetic iron, (titaniferous) which are gathered and washed by the "beach miner" for their golden contents. The residue composed of this valuable ore of iron is thrown away in quantities sufficient to warrant the erection of reduction works for the manufacture of steel.

Mercury.

Cinnabar, an ore of this metal, occurs in place at a point four miles below Oak Bar, on the Klamath river, Siskiyou county; also as float on the head of the west branch of Beaver creek, near Mt. Sterling, where it is found in sufficient quantities to have warranted the erection of a retort for its reduction. Its source has not been discovered. The ores are of an unusually high tenor in quicksilver. It has also been found at a point near the southern boundary of the county; and on White Gulch and Russian creek on the headwaters of McCloud river, cinnabar is found in considerable quantities.

Mineral Earth

Of the ocher variety, suitable for paint, is found at Hayden valley, near Callahan's ranch, on Scott river, Siskiyou county, and near Bailey's ranch on the Klamath, the latter of a superior quality; colors, bright reddish, brownish and yellowish. It is also found in Modoc and Del Norte counties.

Marble.

Marble mountain, a notable and prominent landmark in Siskiyon county, is wholly composed of this stone. Its bold craggy peaks, vertical cliffs, deep chasms glistening in the sun, present a striking and attractive feature. At Etna in Scott valley a marble quarry has been opened and mill erected. The product has a local demand for ornamental and building purposes. The quarry, though yet in its infancy, gives promise of proving of great value. It contains two varieties of stone—a clouded mottled and veined marble, and also a pure white crystalline, free from foreign matter, fracture or cracks. It is suitable for statuary purposes, cutting easily and smooth with sharp lines. With railroad facilities this product would meet with a ready sale in San Francisco and elsewhere.

Aragonite, a species of onyx, is found near Dunsmuir in vein, but not extensive; marble also occurs in Humboldt and Mendocino counties in several localities.

Native Silver

Is found in all the water-courses that are tributary to Indian creek, a branch of the Klamath river. This metallic product is found in the alluvions of this region in about equal proportions in weight to the gold. Its source has not been discovered.

Precious Stones.

Several diamonds are said to have been discovered by the miners in cleaning up their sluices at Hamburg Bar, Siskiyou county. Mr. Stutts of that place has a small one in his possession that he so found.

Chalcedony and agates are abundant in the mountain ranges skirting Shasta valley, particularly in the Black mountains.

Opals are found in Modoc county, four miles from Adin, varying in size from a pea to a bean, and partaking of their shape. They are smoothly rounded and when cut receive a high polish. Of 100 specimens that were sent to a lapidary in New York it is reported that five of them proved to be gems of considerable value. They are found in place resembling plums in a pudding. The matrix is a decomposed talcose argillaceous formation. They are also found with the alluvions in the water-courses that head in the bed.

Platinum and Osmi-Iridium.

These metals are found in the alluvial washings of the east fork of the Salmon river, Siskiyou county, ten miles above the mouth of Shattuck creek, in sufficient quantity to be of great annoyance to the placer miner when cleaning his gold from extraneous matter, the specific gravity rendering it difficult to separate, and the quantity not being sufficient to make a specialty of saving it. Mr. Ball, a prominent mine-owner in Siskiyou county, reports the occurrence of platinum in place in a quartz mine that he is working on Methodist creek. In Humboldt county both platinum and osmi-iridium occur in the black sands of the beach at Gold Bluff in considerable quantities.

Pumicestone

Of a good quality is found in the "lava-fields" east of Montague, Siskiyou county; also in Modoc county, in the "lava-beds."

Plumbago.

Graphite (the black lead of commerce) of a good quality occurs in place in the vicinity of the Black Bear mine, Siskiyou county; also in considerable quantities at Gasquet, near Crescent City, Del Norte county.

Roofing Slate

Is found on the banks of the Klamath river three miles above Orleans Bar, and also in Humboldt and Del Norte counties.

Sandstone.

Humboldt, Mendocino and Siskiyou counties contain extensive reefs of sandstone suitable for structural purposes, particularly in the latter county. Mr. Scobie, the C. P. R. R. expert in stones for structural purposes, pronounces them quite equal to the celebrated imported Scotch stone. They vary in color, hardness and tensile strength. Gray, drab and blue of various shades are seen. The stone cuts soft and hardens on exposure. It dresses smooth and splits with the wedge perfectly true. In one of the two quarries near Yreka I measured a block that had been quarried ready for dressing. Its dimension was 6 by 6 by 17 feet. The strata varies from two to ten feet in thickness and lays dipping east at a small angle of inclination, in fact nearly horizontal. In Yreka it is used for flagging and structural purposes. The courthouse and other public buildings are built of this stone. Near Henley, in the vicinity of the Oregon & California railroad, another quarry has been opened. This stone is a dark gray and blue, hard and susceptible of a polish.

Steatite

(The soapstone of commerce) occurs in several localities in Siskiyou county. It is equal to the best imported and is entirely free from grit or silicious matter. It cuts easily with a saw and is susceptible of a polish. It is found in vein at Oak and Hamburg bars, on the Klamath, in Scott valley, between Fort Jones and Etna; also at a point 1½ miles from Dunsmuir a vein has been discovered five feet in width. This stone is used for fire-fronts, fire-brick, stove linings and for ornamental purposes.

SMOKELESS COAL.—A new kind of coal, making but little smoke, is being used by the Powell-street cable road with satisfaction both to the company and the residents in the neighborhood. The coal was recently discovered in British Columbia. It leaves but little ashes, and gives better results than that the company has been using.

THE hoist plant of the Plymouth Con. mine, in Amador county, was recently sold for $75,000 by Messrs. Hayward & Hobart. The plant will be shipped to the Mulatos mine, in Old Mexico.

The Stewart Mining Bill.

A Miner's Opinion.

EDITORS PRESS:—In a copy of the MINING AND SCIENTIFIC PRESS of Aug. 10, 1889, I saw the bill Senator Stewart intends to introduce at the next session of Congress. I do not think that Senator Stewart's bill will be of any benefit to mining or mining resources, or any encouragement to prospectors. The Senator states in his bill that no person shall acquire by location more than 1500 feet on the same vein. I will first call his attention to this point. How many mines are located where the apex of the vein or ledge is traceable for 1500 lineal feet along the surface, and when an applicant can positively swear that it is the same identical vein for the said 1500 feet? Now for the sake of argument I will answer that question. There is not one mine in a hundred that is located where the apex of the ledge is traceable for 1500 feet.

Now I will suppose that John Doe makes a location and takes up 1500 feet along the course of the ledge and has his location monument and his discovery shaft on the center of his claim, and he finds that the course of his ledge is running north and south. He names his mine No. 1, and still he takes up another claim on the north end of No. 1 and calls it No. 2. Now Mr. Roe comes along and sees these two claims taken up, and he says to Mr. Doe: "You have two claims on the same vein, and under the law of the United States you can only hold one." Mr. Doe says that he has but one claim on the same ledge, and that they are two separate and distinct ledges running parallel with each other. And if Mr. Roe thinks that these two claims are on the same ledge, it is for him to prove it. Now what will the applicant have to do to prove that these two claims are on the same vein? Before he can get a bona fide title to No. 2 claim he will have to commence at the discovery shaft of No. 2 claim and take the surface from off the apex of the vein until he comes to the discovery shaft of No. 1. If the apex does not come to the surface, he will have to sink a prospect shaft at the discovery point of No. 2 and run a drift along the ledge until he comes to the discovery shaft of No. 1, which would be 1500 feet, before he, Mr. Roe, could dispossess Mr. Doe of No. 2 claim.

Now I will ask how many prospectors are there that can afford to enter into litigation where it would require so much labor and expense to prove a bona fide title to the mine. When Mr. Roe would get through with the law and the lawyers, even if he had a mine that would be worth $100,000, he would come out at the little end of the horn.

I think that Senator Stewart's idea is to keep prospectors from monopolizing mining camps, but he has taken the wrong track to do it. If he wants to keep prospectors from monopolizing mines or mining camps, he should make a law to the effect that no person can hold more than one quartz claim either by location or possession in one mining camp, and one placer claim of 20 acres at one time, and at any time that he feels like abandoning them he could do so by posting a notice to that effect. Then he would be at liberty to make another location, but he should specify in his notice his abandonment of his previous location.

The principal point in making mining laws is to avoid litigation as much as possible and to make them as plain as possible, so they can be easily understood, for all men are not born lawyers. I think that the old mining law of 1872 is good enough, with the exception of two clauses—that is, that no person can relocate a claim that he previously located, and the day of relocation be on the 1st of October instead of the 1st of January.

If a prospector has energy and ambition enough to prospect the unexplored mountains of the U. S., he ought to be entitled to all that he may find in regard to mineral, and make all the locations that he pleases, whether it is on the same vein or not. Some one may come along that never spent $1 in prospecting, nor never knew what it was to bear the hardships of a prospector's life; some one who never spread his blankets on the mountain-tops or made a spring mattress out of sagebrush, and would reap the same benefit out of his find under Senator Stewart's new law. The average prospector and miner is well versed in the Mining law of 1872, and to change it to any extent, it would be years before the greatest portion of them would thoroughly understand how to take up a mining claim and hold it legally. No person need be alarmed that either the capitalist, miner or prospector will monopolize the mining industry of the U. S. under the Mining law of 1872, nor will it be controlled by a trust company. On the other hand, the mining industry of the U. S. is too extensive, and there are too many rich mines and mining camps springing up every day to be controlled by any capitalist, miner or prospector. It is through the energetic prospector that all these rich mines and mining camps come to the front. Why do we want to make a law that will impede the ambition that was given him by Nature? If we do we will impede the capitalist and the prosperity of our mining industry.

MINER.

Willow Creek, Humboldt Co., Nev.

PENNSYLVANIA OIL.—Pennsylvania produced over 16,000,000 barrels of petroleum last year, and Ohio 10,000,000. Five years ago the production of Ohio wasn't worth noticing.

Best's Steam Harvester.

Daniel Best of San Leandro, Alameda county, is one of our best-known California inventors in the line of agricultural machinery. During the 20 years that he has been engaged in inventing and manufacturing in this State and Oregon, he has sent out a number of devices which have been found valuable, but he considers his steam harvester, which he is now manufacturing largely, his chief work, and certainly the early performances of the outfit in the field this season warrant him in assuming considerable confidence. As the machine is one of the very important class of combined harvesters which California has given to the world, we take a local pride in making it more widely known to our readers. The engraving on this page shows the engine and harvester as it is when in actual operation, the picture having been drawn from a photograph taken in the field.

The chief components of the combined machine are two—the traction engine which gives the locomotion, and the harvester which has its cutting and cleaning machinery operated by an auxiliary engine which takes its steam by means of a flexible pipe from the boiler of the traction engine. Thus the harvester is independent in action, and the speed of its operating parts has nothing to do with its locomotion—a feature of great importance when the harvester is working in trying situations.

The traction engine shown in the engraving was patented by D. L. Remington of Oregon, but as now manufactured by Mr. Best, it includes important patents of his own. The boilers of these engines are of steel and are a modification of the vertical and horizontal combined; main body being upright, four feet in diameter, be multiplied 25 times by means of its application to the rims of the wheels instead of centrally to the axle.

The engraving shows also the Best combined harvester as it is used with the traction engine. As has been said, an auxiliary engine is used on the harvester, taking steam through a flexible steam pipe from the boiler of the traction engine, doing away with all gearing necessary to run the harvester, the effect being a steady, uniform motion at all times and conditions of the grain, and at any speed that the harvester may be traveling. For fuel, straw, wood or coal can be used, the straw being taken from the rear of the separator by a conveyor to the furnace door of the engine, being very convenient to fire. This harvester cuts a swath 25 feet wide, and with the engine can be moved at the rate of three miles per hour, and will harvest from 65 to 100 acres per day. This harvester has made an excellent record in the field this year, and will be pushed next season.

Of the traction engines as now made by Mr. Best, four have been used this year. J. S. Butler took out the first engine last January, used it during the winter for plowing and replowing, harrowing and grubbing land, and then hauled his harvester with it. W. Fennell of Tehama took out his engine in February and used it for plowing until time for running the harvester. Kester & Peters of St. Johns, Colusa county, have the first of Best's full-rig steam harvester and engine, and have used it successfully. Henry Best of Yuba City used his rig for harvesting and is now hauling grain from the fields to the shipping-points.

Mr. Best has great confidence in his engine for steam plowing. A draw-bar is attached to the engine, to which are hitched whatever number of plows are desired. Take for example a dozen plows, and the engine moving at three miles an hour, or about twice as fast as a team, and one can easily figure how much land it will turn in a day. The manufacturer holds that it will do the work of 75 mules and can be



DANIEL BEST'S STEAM-HARVESTING OUTFIT; INCLUDING TRACTION ENGINE AND COMBINED HARVESTER.

with 160 two-inch flues five feet long; the fire-box is horizontal, 6½ feet long, 44 inches wide and 36 inches high, staybolted in the most perfect manner. A most important feature of the boiler is the combustion chamber, in which the smoke is burned and the sparks and cinders are caught. This makes the boiler safe from communicating fire, and it is said that smoke only appears from the stack when starting up.

Attached to the boiler are wrought-iron bed plates, 6 inches by 1 inch thick, which form the main frame for all of the machinery. To the said bed plates are attached Duplex engines 9x9 geared to the inner circumference of the two large drive-wheels. Five gear pinions and wheels constitute the whole gear. The application of the power directly to the rim of the wheels gives the engine wonderful drawing-power as compared with gearing near the axle. The weight is balanced upon the two main wheels, which are 8 feet in diameter and 26 inches face. These large wheels so strongly geared are able not only to pull an immense weight, but can surmount obstacles, such as running over logs and raising out of holes and depressions which would seem to be impossible. The value of this feature has been proved in the use which has been made of the engine in the logging regions and in clearing land. The whole weight of the engine, which is about 11 tons with the water-tank filled, is applied directly to the lifting of cogs in the segments on the inside of the rim of the wheel, and the heavier the pull the tighter the wheel sticks to the ground. The gear is differential, so that each wheel acts independently and can turn in a 16-foot circle, or can turn a square corner with the harvester attached. The lead or steer wheel is 5 feet diameter and 16 inches face with a central flange to take hold in the ground. It is easily operated by the engineer by means of ingenious and effective steering apparatus. The twin engines develop 40-horse power with 100 pounds pressure, and 60-horse power with 150 pounds pressure, and this power is believed to operated for the cost of the barley which they would consume.

Mr. Best has been adding many improvements to his shops at San Leandro and calculates to finish up one engine per week. He has now a number of orders ahead and expects that his rigs will do much plowing this fall and winter.

Drift Mining.—The Hidden Treasure drift mine, Placer county, is yielding low-grade gravel, but it pays. In the last "run" 52,551 carloads of gravel were taken out, averaging 3000 pounds each, yielding $81,249.45 in gold, from which a dividend was declared of $29,340. As the gross yield per carload was only $1 54, this shows admirable management on the part of Harold Power, the superintendent, especially when it is known that the mine has 8000 feet of very bad tunnel to keep up and is one of the hardest mines to work in the district. Competent mining experts in Placer county say that there are over 200 miles of just as good mining ground still unworked in that county.

Hydraulic Miners Released.—Fie Kie and others have been released by the Supreme Court on a writ of habeas corpus from the custody of the sheriff of Yuba county. They had been fined $500 for hydraulic mining, contrary to law, but the Supreme Court decided that a sentence to hard labor was not proper as a punishment in addition to a fine.

Very rich ore is coming out of the Idaho mine, Grass Valley, at a point near the Maryland mine. The latter will doubtless prove as good as the famous Idaho when properly opened and worked. It is a wonder it has not long since been equipped for extensive operations.

A Boat at One Blow.—It is now proposed to strike a boat from a die, virtually in one piece of mild steel, with no rivets except where fittings are attached.

Unprospected Lands.

A Hungry Creek correspondent of the Yreka (Siskiyou county) *Journal* sends in the following: There is a large tract of land on the line of California and Oregon in this county that has not been prospected. Little is known of its mineral and agricultural resources except by cattlemen. It is one of the best stock ranges in the State, as the stock in their fat and sleek appearance prove. Near the line of Oregon the Beaver river leaves the gold belt and enters a sandstone formation, from which point I will describe. Deer creek has been worked at the mouth, but I think it did not pay much, as it is a mass of bowlders to within three miles of the summit. There it opens out into beautiful level glades covered with grass. In one of those glades Mr. Flatt has been placer mining for over a year. He is making wages although he has very little water. In the next glade James Sterling took out $250, and in another glade two men have just stopped work, the water giving out, who told me the claim paid, and are going back next spring. I tried two other glades and found gold but no water. The gold is full of quartz, and there are several quartz ledges crossing the head of those glades. Soda creek has four large glades with lots of grass. Prospected it for placers, but did not find much. The same ledges that cross Deer creek cross it. Bear creek is a large basin, full of glades with grass and water. Found gold in its tributaries, also noted several quartz ledges. The west branch of Beaver has been worked at the mouth to within five miles of the summit. Nuggets from $30 to $80 have been found within two miles of the summit. Its tributaries are not prospected. Did not prospect the quartz ledges, my time being occupied with the quicksilver mine. No wonder it did not pay. Of all the rat-traps for reducing work that company ought to get the cake. I don't think they are on the ledge. A short distance above their works I found a light-colored clay, conglomerate mass, quartz, ore, rock and silicons, which accompany quicksilver mines in this State. The formation for gold in these creeks is good, the same as Applegate, both heading in the same mountains. The only reason I can give for one being richer than the other is: Applegate being on the northern side of the Siskiyou mountains, is exposed to the dampness, which has worn the mountains and deposited the gold in the gulches. It is the reverse with these creeks. They are on the southern side and are protected by the mountains. The wear is not one-quarter as much and three-fourths of the gold is in the mountains.

Open Your Mines.—There are persons owning mining claims in this district who never have nor never will develop them. They have located them for the sole purpose of speculation, thereby keeping miners who would work away from the camp. They expect some one to come in and develop the country while they sit around on the street corners and tell strangers what a fine mining camp we have. Such persons are a detriment to the camp, and the sooner they get up and go away the better it will be for the camp. There are a few persons here that are doing all they can to develop their property, but the remainder are sitting around waiting to reap the benefit of their work. Now go to work and open your mines so a person who wants to buy can see there is something in them, or get out. There is no longer room for drones here.—*Julian Sentinel.*

A New Pipe Threader.—Mr. Mulkley, of No. 1 Crankshall Lane, Wendsbury, Staffordshire, England, has just invented a new machine for cutting threads on pipes of all sizes from 2 inches to 24 inches in diameter. It is claimed that this machine will save at least 50 per cent in labor and steel over any other machine now made.

Are Water Rights Mining Property?—The Supreme Court has heard oral arguments in a suit of general interest to miners. The suit involves the water rights of the Blue Tent Mining Co. of Nevada county, which were sold, and after the sale McShane, a subsequent oreditor, sought to have the sale set aside, on the ground that it was in opposition to the Act for the protection of stockholders, passed in 1880. The first question raised is, whether under the statute of 1880, making it unlawful for the directors of a mining company to sell mining ground without the consent of the stockholders, it is necessary that the stockholders' consent should be executed, and if, when the deed is shown to have been properly executed, it will be presumed that the stockholders actually consented to the sale. The second question is, whether, after a mining company has sold the property, received the purchase-price, and delivered possession, a subsequent creditor can attack the deed and have it declared void for a lack of ratification—in other words, whether the statute shall be so interpreted as to make all unratified deeds absolutely void, or only to be set aside at the suit of stockholders, no one but a stockholder being able to attack the deed. The further question is raised whether the term mining property includes water rights.

A Discouraging Law.—Considerable dissatisfaction is being expressed by local merchants over a recent order of Secretary Windom, based upon an Act of the last Congress calling for the collection of a tax of ten per cent ad valorem on "all merchandise imported in vessels not of the United States, which are not placed by law or treaty on the footing of vessels of the United States." Collector Phelps enforced the provisions of the new law upon the arrival on Thursday of the Mexican steamer Alejandro. She brought up a valuable cargo of silver ore and bullion, worth about $30,000. Thannhauser & Co., her agents, and other merchants interested, were surprised when notified that the duty must be paid. They consider the law a great discrimination, more especially as it now only affects Mexican vessels. The Alejandro is the only Mexican steamer plying between this and Mexican ports. The Newbern of the Pacific Coast Steamship Co. is her rival.

Reported Discovery of Diamonds in Mexico.—The following is from *El Partido Liberal:*

"It is well known that Gen. D. Vicente Guerrio has discovered, in lands of the State which bears his name, rich beds of diamonds, but we have not found out the exact point where these abundant diamond-beds are situated, as they have never been worked. Only lately, and by the merest chance, this fabulous wealth was found in a sierra named Coronilla, near the village of Tepantitlan, in a district of Guerrero. The bed, as we learn, is situated at the bottom of a barranca, or ravine, in argillaceous land containing an abundance of small stones."

Chrome from Red Bluff.—The firm of N. R. Knight & Co. of San Francisco have contracted with the owners of the chrome mine in Tehama county, to work the same until Jan. 1, 1892. The head of the firm is now making arrangements for active work. A force of men is now getting out several tons of ore daily. It will be hauled four miles to the county road in small wagons, carrying a ton and a half each, thence by heavy teams 25 miles to Red Bluff, where it will be sent to San Francisco and shipped by Cape Horn to the Philadelphia Reduction Works. There is a mountain of ore and the quality is said to be equal to that of the Livermore mines. Employment will be given to a great many miners, men and teams.

The Reno *Gazette* tells of a lumber raft containing 750,000 feet that was towed recently from Bijou, Lake Tahoe, to Glenbrook.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

VOLCANO MINING.—*Ledger*, Aug. 24: The operations of the French Co. on the cement gravel claim continue to pan out very satisfactorily. The Huntington mill crushes about six tons per day, running only during daylight, as the water supply is not sufficient to run all the time. A cleanup is made every night. The cement, which is as hard as quartz when taken out, slackens considerably when exposed to the atmosphere. There are several hundred tons on the dump, and a couple of guards are employed at an expense of $8 per day to watch this dump. From this fact alone the inference to be drawn is that the cement is heavily freighted with the precious metal. Negotiations are in progress for the purchase by Colorado capitalists of the Volcano Gold Gravel Mining Co.'s property, including the big tunnel. It is also rumored that the McLaughlin ditch is being negotiated for by the same parties.

MISCELLANEOUS.—At the Gardner or Paugh mine near Clinton, the tunnel has been driven 150 feet under the present management, with 150 feet more to run before it is expected to strike the ledge. The tunnel is making satisfactory headway. The Alpi Co. has entered into an agreement with San Francisco parties for the sale of the Alpi property. The promoters of the South Eureka mining scheme will shortly make an effort to place stock for the purpose of raising working capital. The mortgage for $10,000 held by Mrs. R. J. Nevills on the interest of W. A. Nevills in the Moore mine and other property, was released last week. We understand a full discharge was made on the payment of $8000. Ex-Governor Blaisdell, who is interested in the Blaisdell riffle belt, visited Amador this week. He called on J. R. Tregloan, superintendent of the South Spring Hill mine. They visited the mine and mill, where one of the Blaisdell belts is working very satisfactorily. This mill is one of the best equipped in the county, having every gold-saving convenience. A new improved Knight's rock-crusher has been lately put in position. The mill and hoisting works are lighted by electricity; the brilliancy of the light, its cheapness, the little danger from fire, should recommend it to all mill-owners. The cheapness of electricity in mills is exemplified here, the water which supplies the power being subsequently used for the batteries. The Talisman mine adjoining is supplied with one light by this dynamo at a cost of 25 cents per month. The machinery of the Keystone is undergoing repairs. The engine is to be thoroughly overhauled, a sufficient quantity of rock being on hand to supply the mill till such time as the engine is again working.

Calaveras.

WATER SUPPLY.—Angels *Echo*, Aug. 24: Owing to the failure of the water supply for mining in this vicinity, some mines have been compelled to shut down, while others have been obliged to reduce their force until the rains set in. Angels will now experience a spell of quiet, in fact dullness, for at least three months to come.

STICKLE.—Owing to the lack of water for mining purposes in this section, operations have been suspended in the Stickle mine in this town. Owing to the same cause quite a large force of the miners have been laid off at the Utica mine.

UTICA.—We are informed that the Utica mill is to be run by steam, and that preparations are making to put in a large engine for that purpose.

MOKELUMNE HILL.—Scarcity of water for mining purposes is the general cry in and around Mokelumne Hill; and in consequence of the drought, times are dull.

THE THORN.—Work is progressing finely in the Thorn mine near San Andreas. The ore prospects well, and the parties now working the mine are hopeful of developing a good paying property.

GRAVEL.—Gravel is being taken from Evans, Lampson & Co.'s mine at Railroad Flat, which yields all the way from 25 cents to $2.50 a pan. Some very coarse pieces of gold have been found. There is a good supply of gravel in sight, insuring the company a good paying property for years to come.

Inyo.

ANVIL SPRINGS.—Cor. Inyo *Index*, Aug. 23: About eight miles northerly over a low divide into a valley, through miles of white sage, Anvil springs are reached. A short distance above, and of easy access, several veins of galena carrying gold and silver have been discovered, one having been sunk to the depth of between 30 and 40 feet, carrying ore the entire distance. Others have been sufficiently uncovered to warrant further exploration, but under present circumstances the ores cannot be profitably handled. Freight from this point to nearest railroad costs $60 per ton; thence to San Francisco, $8; $15 for reduction charges; making a total of $83 per ton.

GOLD HILL.—Leaving Anvil springs, crossing over to the northeastern corner of the valley, thence through some rolling hills, after a 10-mile tramp a new mining camp called Gold Hill is found. The new discovery is situated in Panamint mining district, seven or eight miles southeasterly from the town of Panamint, and on the Death valley slope of the Telescope range. The ores are rich in gold, the veins strong and well defined, and as far as opened have every indication of permanency. Sufficient labor has been performed upon the mines owned by Mr. R. B. Taylor and associates to warrant the erection of reduction works. They are awaiting cooler weather before beginning operations. Messrs. Fletcher & Prentice have some fine ledges which they are developing. As far as opened they not only look encouraging, but promise to become valuable properties. Climbing the eastern slope of the Telescope mountains to the summit, traveling some eight miles northeasterly, passing a large monument of rocks placed to designate the exact center point of Panamint mining district, passing down from the backbone of the mountains from which Death valley, Funeral range, Amargosia and other mountain ranges were viewed to the East, and Panamint valley, Argus range, Sierra Nevada, and Inyo ranges to the west and north, with Telescope peak to the right and Sentinel peak to the left, a trail branches to the west leading down to Surprise canyon, or valley, where nestles the little town of Panamint. Here a 10-stamp mill has been built for treating the ores, which, being of a rebellious character, require roasting. The mill has a 35-ton Stetefeldt furnace and room for 10 additional stamps. A fine engine of 120-horse power and two sets of boilers furnish motive-power and steam for amalgamating purposes. During last winter Mr. J. Curran extracted from the Hemlock mine about 15 tons of ore, which, with three tons of other ore furnished here, produced something over 3400 ounces of bullion, working up to about 95 per cent, the ore averaging over $190 per ton, which is a pretty good showing for this district. In the mine where this ore was obtained there is a large body that will average, as broke from the vein, over 40 ounces in silver. Under existing conditions this was not worked, in consequence of difficulties of obtaining cheaper mill supplies, etc. At present it costs $4 per ton to pack the ore from mine to mill. There are 13 patented mines in Panamint district, all of which are owned by the Surprise M. & M. Co. Many others have been located and opened by private parties, who, knowing their value, are patiently holding their properties. The ledges generally have well-defined smooth walls carrying a plastic clay casing. When the metamorphic and primitive rocks are reached, more uniformity of the ore bodies may be expected. A porphyry dyke trends north and south through the silver belt a short distance north of town. Ledges of greenstone protrude above the surface. Deposits of alum and sulphur crop out. A huge ledge of iron pyrites runs along the northern side of the mountain forming Surprise valley.

Kern.

ASPHALTUM.—Kern Co. *Echo*, Aug. 24: A party of gentlemen from town were riding up the river a few days ago, and when near the head of Kern island canal a dark substance attracted their attention. On making a careful examination they discovered that it was asphaltum of a high grade. An extensive ledge was found to exist there with well defined outcroppings. It is situated on land belonging to J. M. Keith, about three miles from Sumner, and is easily accessible.

Los Angeles.

SAN GABRIEL CANYON.—Cor. Azusa *News*, Aug. 23: The San Gabriel mines are now being worked from the North Fork to the foot of Old Baldy, a distance of some 15 miles, with good average pay, some parties making as high as $20 per day, while others make from $2 to $5. All are making a good living, which is quite an item these hard times. The miner never wants for water to wash dirt with, nor wood to cook his grub. Mountain trout for breakfast all the year around, deer six months, and mountain sheep looking at you from all the surrounding hillsides. A few people come in the canyon and go to work in the mines expecting to get rich in a few days. Such men are apt to get disappointed, as mining requires an honest day's work with the pick and shovel. These mines are the best poor man's in Southern California. Supplies are easily gotten at Azusa, 12 miles distant. Enos Brenna, the old '49er, struck a pocket yesterday, and took out $27 worth of nuggets and a tablespoonful of fine gold.

Monterey.

QUICKSILVER.—Salinas *Democrat*, Aug. 24: W. D. Murray brought out from the Golden West quicksilver mine two flasks of quicksilver, or 150 pounds of pure metal, the most that has been shipped from any one place in Monterey county. A retort has been shipped in by way of San Simeon and erected at the old mine, formerly owned by Murray, but lately purchased by a San Jose company. The Los Burros mining camp is rather quiet at present.

Placer.

BAKER DIVIDE.—Placer *Herald*, Aug. 24: W. Dodge, superintendent of the Baker Divide mine, at Forest Hill, stopped off at Auburn Wednesday while on his way to San Francisco. Mr. Dodge is still running drifts above the tunnel. Upraises have been made at various points in the tunnel from which drifts have been run, but the channel has not been struck. Altogether 5600 feet have been run in these attempts. The main tunnel is 3300 feet in length and is now in hard rock, and the chances are that the channel is ahead and that the tunnel will tap it in a big curve. The big stream of water that was struck in the first upraise near the mouth of the tunnel still flows with undiminished volume. Mr. Dodge says his company will put in hydraulic elevators in their claim on Boston Bar as soon as they can get the water to run them. The river water has been turned into the Boston Bar tunnel and the river-bed has thus been pretty well drained. They are now mining the old-fashioned way, using a Chinese pump to drain the pit.

LIVE OAK.—*Republican*, Aug. 24: Prospecting has been going on quietly at the Live Oak mine near Forest Hill. They have reopened the old William Wear tunnel for a distance of over 300 feet and found gravel the entire length of the tunnel, with the bedrock still pitching. The Wear tunnel was run as early as 1854, but it was abandoned after finding a large amount of water. The water will now be easily overcome in running a drift from the Live Oak lower tunnel. The present appearances of the Live Oak are very favorable, and pan prospects show fine gold from gravel on the high rim. More will be known about this mine as soon as they reach the bottom of the channel, probably within a few days.

MAY FLOWER.—The channel of the May Flower mine at Forest Hill has lately turned considerably to the west and now runs nearly to the southwest. The gold is coarser and is found near the west rim, while heretofore it has been on the east rim. A few days ago the miners found a nugget which weighed over five ounces and worth about $95. The company has made an upraise from the north gangway to the Orono channel which was recently bought from Anthony Clark. Last Saturday night they broke through the bedrock into gravel 22 feet from the bottom of the gangway. The gravel is mostly quartz and prospects well from a few pans that were tried. The purchase of the Orono ground with over a mile of channel increases very much the value of the May Flower consolidated property.

BAKER DIVIDE.—Placer *Republican*, Aug. 23: It may be said of the owners of the Baker Divide mine above Forest Hill that they are good stayers. They are still working away in bedrock, and the following is a description of the work that has been accomplished: A tunnel has been run 3300 feet. At 2200 feet they made an inclined upraise 440 feet, or a vertical distance of 330 feet. Here gravel was struck on pitching bedrock, but there was a large amount of water to contend with, and so another, but vertical, upraise was made at the extreme end of the tunnel. This was pushed up a distance of 125 feet and then a tunnel was run, over what will be the course of the main tunnel when extended, for a distance of 600 feet. Not finding anything there they turned back just half way in this upper tunnel, and at a distance of 300 feet from its beginning they made a 135-foot upraise, from which point they drifted off 150 feet southeast, while the direction of the main tunnel is south, 20 degrees east. At the end of this 150-foot level they raised 30 feet, and then returned to the top of the 125-foot upraise from the main tunnel and extended the 600-foot level back over the main tunnel a distance of 400 feet. At that point they raised 100 feet and then began on a back level toward their first upraise, which has now been run 280 feet. Summing up these levels and upraises, all through bedrock, it will be seen that the total of the work done has been enormous. The best miners with whom the *Republican* is acquainted are all agreed the result will be that the owners will have to extend their main tunnel straight ahead several thousand feet before they can develop their mine.

Plumas.

MINERAL TOWNSHIP.—Greenville *Bulletin*, Aug. 24: Notwithstanding the general complaint of hard times, the characteristic industry of our citizens shows there is a tendency to overcome the great injustice done them by the injunctions; and not being allowed to work their hydraulic mines, nearly all have turned their attention to surface mining while others have sought new vocations. All are waiting anxiously for the report of the debris commission, for as they seemed to express themselves favorably toward our locality we cannot but hope that we may receive some benefit at their hands. All the quartz mines in our vicinity which are placed on the market have been carefully examined by experts during the past week or so, and conditions are very favorable that some will soon change hands. Several of the stockholders of the Shenandoah Quartz M. Co., better known as the Whiting ledge, have visited the mine recently and are very favorably impressed with the indications. If reports are true we will soon hear the sound of stamps reverberating through the "sleepy hollow" of French ravine. Considerable work is being done on the East Branch in the vicinity of Rich bar with very good results.

San Bernardino.

HOLCOMB VALLEY.—Cor. *Miner and Artisan*, Aug. 28: The Valley Gold Co. is doing an enormous amount of work under the superintendency of W. E. Pedly, who has now emp'oyed about 65 men. They have completed 1400 feet of tunnel through solid rock, and have yet 200 feet to complete it ready for work. They are laying two miles of 8, 10 and 16-inch pipe, and building several reservoirs.

CUSSIONBURY.—The Southern California Syndicate Co., limited, composed of English capitalists, has purchased one of the groups of the Black Hawk mines, and have just completed survey of a pipe line from Arctic Springs to Lookout mine, a distance of 6¾ miles. Work will be commenced on a 40-stamp mill immediately after the arrival of Mr. Alexander Del Mar, from London, England, who is expected daily. The Deer Park Mining Co. of Bear valley have struck a large flow of water at a depth of 66 feet, on their placer diggings.

San Diego.

A $50,000 DEAL.—Julian *Sentinel*, Aug. 23: On last Saturday the deal which has been under way for about ten days between King & James, owners of the Owens mining property, and H. A. Williams, a wealthy gentleman of Ohio, was closed, and the papers signed at San Diego. The property covered by this deal comprises three mines—the Owens, Jeannette and San Diego, the purchase price being $50,000. Mr. Williams left for Ohio Sunday, to attend to business connected with this property. Mr. King remains in charge during the absence of Mr. Williams, with authority to push the work. He has let the contract for sinking in the bottom of the old works, William Chambers being the contractor. Work was commenced yesterday, and we hope will not be again interrupted. Reports come from the Pine valley district of more rich mining discoveries. Lots of prospecting going on and mines being opened.

Shasta.

KENNET NOTES.—Cor. *Free Press*, Aug. 23: The Clipper mine is, to our sorrow, at a little standstill again, but we learn that arrangements are being made to give another and longer bond on said property. The Uncle Sam mine is doing lots of work, tramways are being erected, ditches for water-power are being dug, and all around the mine improvements are being pushed with vigor. Capt. Wm. James of the S. B. mine arrived here a few days since to look after the interests of the camp. S. J. Johns, Esq., manager, and Mr. Hopper, secretary of the Uncle Sam mine, are doing lots of work to bring all in mining order as quick as brains and money can accomplish it. The Snyder Mining Co., James Baron, superintendent, is starting up its mill, and we are waiting good results. The Butters Ore Milling Works is receiving shipments of sulphurets daily from the Uncle Sam mine, and no doubt they will be worked with fine results.

Sierra.

A RICH POCKET MINE.—Nevada *Transcript*, Aug. 24: Apple & Grant, the young millwrights from San Francisco, who last winter took out $12,000 from their little quartz claim just this side of Kanaka creek between Alleghany and Chips flat, working there by themselves and doing their crushing with a hand mortar, have found more rich ore. They first struck pay in the old tunnel run years ago by a Sacramento company that abandoned it in disgust after spending much money without getting any back. They have since run another tunnel 75 feet lower and this also shows pay. Mr. Apple is at present in charge of the operations, Mr. Grant being in Alaska superintending the construction of a large quartz-mill. The property is situated in the same belt as the Oriental, Docile, Plumbago, Fessler's and other claims, some of which have yielded phenomenal returns at intervals.

THE RED CHIEF MINE.—Nevada *Transcript*, Aug. 23: Levi Kendricks of this city and J. H. Seek of San Francisco have returned from the Red Chief mine on Kanaka creek, Sierra county, where they have been testing the ore with a Huntington crusher. They obtained good results. The ore they put through was of medium grade, milling about $5 a ton. The ledge is 250 feet wide, and the Red Chief Co. has locations on it aggregating 6000 feet in length. The new 40-stamp mill will be completed soon. A portion of the stamps will be started next week, and it is the intention as soon as the winter storms come and increase the water supply to have the mill in full operation.

SUNFLOWER.—*Mountain Messenger*, Aug. 24: The Sunflower Co. of Pike City is clearing ground at the tunnel mouth, preparatory to putting up a mill. It is to be a Huntington, we believe. The latest report is that some very good rock has been developed. J. B. York and Phil Lantz found a piece of quartz in their diggings in Slug Canyon last Saturday, valued at about $100.

Siskiyou.

QUARTZ.—Yreka *Journal*, Aug. 28: Messrs. Radelfinger & Dannenbrink, owners of the Gold Run mine at Know Nothing creek, have built a new ditch to secure more water-power for running their quartz-mill, which is about completed. They have been offered a big price for their mine by an English company of capitalists, but it is doubtful whether a sale may be effected, as they have a large body of exceedingly rich quartz in sight, to insure permanency. An English company, owning a ledge on Methodist creek, another tributary of the Salmon, not far from Know Nothing creek, intends making preparations to develop it on an extensive scale, by putting up a large mill and employing a number of experienced quartz miners. The Warren quartz-mill on Yreka Flats will be started up again soon to crush quartz taken out at the Witherhill ledge on head of Spring gulch, near summit of Humbug range. It is a bad place to haul from, with no water in vicinity for animals, but as the weather is becoming cooler, the hauling will not be so severe on teams.

RIVER MINERS.—The river miners on the Klamath are commencing to hoist pay gravel again, their wingdams and machinery having been repaired and rebuilt since the terrific cloudburst of July 24th, which caused such great damage all along the river from Cottonwood creek all the way down to Happy Camp.

Tuolumne.

THE PRICE RECEIVED.—Tuolumne *Independent*, Aug. 24: We are informed that the price received by Mr. Hyde for his property was $30,000. The mine sold for $25,000 and the ranch for $5000.

SETTLED.—The suit involving the Lady Washington mine vs. Hayward & Hobert has been settled. Mrs. Dorsey now has a perfect and undisputed title to the above-named mine.

NEVADA.

Washoe District.

CON. CALIFORNIA & VIRGINIA.—Virginia *Chronicle*, Aug. 24: The usual quantity and grade of ore is being extracted from the various openings on the 1400, 1435, 1500, 1600, 1650 and 1950 levels. On the 1600 level continue to extract ore from ground bordering the south drift from the Ophir line on the sill floor. On the 1650 level: The stopes on the seventh and eleventh floors above this level continue to yield the usual quantity of ore of fair quality. During the week 1028 tons and 1540 pounds of ore were shipped to the Morgan mill; 1791 tons to the California. The average assay value of all the ore worked at these mills during the week, according to battery samples, was $31.10. Shipped during the week bullion valued at $44,768.40 to the Carson mint. Now on hand in the assay office about $21,000.

OCCIDENTAL CON.—On the 300 level a north drift is advanced 56 feet from the upraise, 90 feet on the slope above this level showing value. Extracting ore from the 350, 400 and 450 levels. During the week extracted and milled 348 tons of ore showing an average assay value of $17 per ton. Shipped to Carson mint bullion valued at $5974, and have sulphurets on hand valued at $8000.

BEST & BELCHER.—On the 550 level the northwest drift is extended 56 feet; formation, porphyry, with streaks of quartz. On the 1000 level the northwest drift is extended 191 feet; formation, porphyry and quartz showing some value.

GOULD & CURRY.—On the 300 level the west drift from crosscut No. 2 is extended 53 feet; formation, soft porphyry. On the 400 level west crosscut No. 1 is extended 250 feet; formation, hard porphyry.

BELCHER.—The 200 level west crosscut is in 113 feet, the face in porphyry. Have resumed work in the 1200 level south drift. The raise above the 1200 level is in quartz assaying from $4 to $8 per ton.

JUSTICE.—The mill crushed 201 tons of ore during the week, showing a value of $18.52 per ton by battery sample assays. The top of the raise above the 490 level has entered fair-grade ore.

CROWN POINT.—The 700 level south drift is in low-grade quartz. The 800 level south drift is out 43 feet and the west crosscut 87 feet, the latter in porphyry and quartz.

UNION CON.—On the 1465 level west crosscut No. 2 from the north lateral drift is advanced 304 feet, passing through a formation of porphyry and clay.

HALE & NORCROSS.—Repairs in progress on the various levels. On the 500 level have put in square timber sets up to the Savage line, where good ore is showing.

ALTA.—Stopes on the 825 and 925 levels yielding the usual quantity and grade of ore. Crushing and concentrating the usual amount and grade of ore.

NORTH OCCIDENTAL.—On the 400 level the north drift is advanced 211 feet. The face continues in porphyry and very hard quartz carrying value.

SIERRA NEVADA.—On the 520 level from the shaft station, an east drift is advanced 1152 feet, continuing in hard porphyry with some water.

ANDES.—Drifting west in quartz and porphyry from the raise above the 350 level and from the bottom of the winze below the 350 level.

OVERMAN.—North drift from the winze and top of upraise continues in quartz. The Caledonia south drift continues in vein material.

ALPHA.—The 500 level west crosscut is in 217 feet, the face in porphyry and quartz. The 382 level west crosscut is in quartz and clay.

CHOLLAR.—The 750 level north drift continues in porphyry. The 650 level west crosscut passed through five feet of low-grade quartz.

POTOSI.—The 750 level south drift has stripped 50 feet of solid quartz giving low assays. Nothing new in explorations at other points.

OPHIR.—On the 1465 level the raise above the east drift from the shaft station is up 165 feet, and continues in a quartz and porphyry formation.

From the 1300 level shaft station an east crosscut will be advanced 300 feet to connect with the top of this upraise.

CONFIDENCE AND CHALLENGE.—The 500 level joint Imperial west crosscut is in 42 feet. The face continues in quartz and porphyry.

MEXICAN.—On the 1465 level the north drift from west crosscut No. 1 is advanced 261 feet, continuing in porphyry and quartz.

SAVAGE.—A north drift from the west drift has stripped 19 feet of fair grade ore. Nothing new in explorations at other points.

IMPERIAL.—The 300 level north drift is out 389 feet from the south line. The face continues in porphyry and quartz.

UTAH.—On the 600 level, the north drift is advanced 485 feet; formation, porphyry and quartz, showing value.

SILVER HILL.—The 160 and 260 level northwest drifts are out respectively 595 and 480 feet.

SEG. BELCHER.—The 1100 level south drift from the Belcher raise is showing bunches of ore.

BULLION.—Explorations on the 760 level are not yet resumed through the Chollar shaft.

NEW YORK CON.—The upraise above the 800 level continues in fair-grade ore.

EXCHEQUER.—The 382 and 500 level west crosscuts continue in porphyry.

YELLOW JACKET.—Continue shipping 50 tons of ore daily.

WARD SHAFT.—Reopening shaft below the 1500 level.

BENTON.—Operations temporarily suspended.

Morey District.

MILL STOPPED.—Belmont *Courier*, Aug. 24: Henry Metz informs us that the mill at Morey has crushed all of the low-grade ore. Mr. Cohen has shut down the mill temporarily. Messrs. Moore & Schendell, the lessees, are making money rapidly. All the stopes show rich ore in large quantities, and the outlook for Morey was never better. The high grade ore will be shipped to Salt Lake for reduction.

Pioche District.

HALF MOON.—Pioche *Record*, Aug. 24: At this mine during the past three months development work has been going on which has put the mine in good shape to produce ore when the smelter begins operations. Several hundred feet of new drifts have been run, all opening up ore in large quantities, except one prospect drift, and it is estimated that the mine is in condition now to yield 25 tons of ore a day for ten months at least. The ore is low grade and requires careful working, but it is easily mined and will pay handsomely. This property, but little thought of only a short time ago, will prove one of the mainstays of the Yuba M. & R. Co. which owns it.

Red Canyon District.

ORE STRIKE.—Virginia *Chronicle*, Aug. 23: Geo. A. Fitzmier returned yesterday from a visit to Red Canyon mining district, Douglas county, where he went to inspect a recent development in the Red Cloud location, which he has been engaged in prospecting for several years and has been finally rewarded by the development of a vein of ore three feet in width, which shows an average assay value across the face of $100 per ton. The vein was cut at a depth of 60 feet below the surface by driving an adit tunnel 140 feet in length. There is a five-stamp mill, operated by steam, about 1½ miles from the mine, where the ore extracted will be crushed. There are only a few men employed in the district. Several owners of mining locations in Red Canyon are also ranchers, and are now about gathering their crops, from the sale of which they will acquire more capital to develop their mining property, expecting eventually to realize a heavy interest on the investment.

Tuscarora District.

COMMONWEALTH. — *Times Review*, Aug. 23: Work of retimbering the shaft is progressing very well. The north drift, 100-foot level, extended six feet, continues to show good ore in the face. The mill will be cleaned up in two days more. Commonwealth concentrates from Grand Prize plant have been worked and give returns of 95½ per cent. Bullion shipments during the week, $21,527.44. Crude bullion on hand, about $10,000.

NAVAJO.—The crosscut from the end of the south drift east, 300-foot level, extended 13 feet. Upraise south end, same level, extended 11 feet and continues in high-grade ore.

BELLE ISLE.—The drift north from the end of the west crosscut, 250-foot level, has been extended 16 feet. The face of the drift looks favorable.

NORTH BELLE ISLE.—The shaft has been sunk and timbered 18 feet. The rock is much harder in the bottom. The flow of water has doubled in the past 24 hours. Everything running smoothly.

NORTH COMMONWEALTH. — Joint crosscut, 225-foot level, extended 13 feet all in vein matter and low-grade ore. East crosscut No. 1, 100-foot level, has reached the hanging-wall. The main south drift has been advanced 10 feet, showing some high-grade ore.

DEL MONTE.—North drift, 225-foot level, extended 14 feet; the face looks favorable for ore. Joint crosscut, 225-foot level, extended 13 feet, all in vein matter and low-grade ore. No. 1 crosscut east, 100-foot level, extended 14 feet, still showing ore in the face.

GRAND PRIZE.—400-foot level: West drift, old vein, has been extended 13 feet. Face of west drift from north crosscut advanced 14 feet, and west crosscut from south drift extended 10 feet. Water is now down 20 feet below the 400-foot level, and good headway is being made in lowering it. The concentrator will be started up on Grand Prize ore next week.

ARIZONA.

SENDING IN ORE.—Prescott *Courier*, Aug. 24: Johns & Ronald, lessees of the Catoctin mine, are sending in ore which goes to Colorado for treatment. The lessees of Dan Hatz's Emerald mine, in Slate Creek district, have shipped ore that worked $150 and $200 per ton in gold. The vein that produces this rich ore is small. Water is troubling the Howard people. They are milling second-class gold ore. W. W. Vanderbilt has men employed opening ledges in good shape. The Boggs and Hackberry mines in Lower Big Bug are being developed in the right way. Rumor has it that T. W. Boggs has disposed of his interest to Mr. Murray, and that Mr. Williams will manage the properties. We have written too much about mines here to go back on what we have said of them, and will close by asserting that the man who professes to believe that the United Verde, the Cherry Creek, Agua Fria, the Etta group, the Big Bug, Tip Top, Walker, Hassayampa, Bradshaw, Peck, Groom Creek, Congress, Eureka and other districts cannot, right now, furnish ore for small reduction works, is deceiving himself or trying to deceive people here who have lived for years off the proceeds of ore from said mines.

MOHAVE NOTES.—*Miner*, Aug. 24: A. E. Rogers had a lot of ore from the Tintic run through the sampling works this week. Dr. W. N. Sherman has commenced development work on the Alma claim, near Mineral Park. John Popham and John Hudgeons are taking out some high-grade ore from a claim on the south side of Surrum's Peak. D. R. Bell will soon commence the leaching of the dump at the Signal mine. Mr. Bell says that the ore leaches readily, and he thinks it will pay. The C. O. D. mine is looking better than ever, and it is expected that the month's work will be a shipment of about 100 tons of high-grade ore. Supt. Bowers has stopped the sinking of the shaft in the Night Hawk on account of the water, and the work of stoping out the new shoots has been commenced. The Empire mine is taking out some very fine ore. Specimens sent in by E. F. Thompson show the rock full of native and wire silver. The richest ore assays something over 1200 ounces per ton. Robt. Patterson was in from Gold Basin this week. The mines in that locality are looking well. The O. K. Mining Co. will commence operations again as soon as the cool weather sets in. Prospecting for water will be continued. Col. R. E. Beattie and J. M. Dawley are looking over the mines in Chloride district.

GRAND PRIZE.—Globe *Silver Belt*, Aug. 23: The Grand Prize mine, formerly owned by Messrs. Gray, Richards and Watts, situated about 15 miles north of Payson, on Webber creek, Gila county, is now in the possession of a Chicago company, with Capt. Burbridge as superintendent and Frank Bissig foreman. They are working 20 men and erecting serviceable hoisting works, a good pump, a cannon-ball mill of 10 tons capacity per day and two concentrating tables. In the bottom of the shaft at a depth of 110 feet is said to be a vein 18 inches to 2 feet wide of high-grade gold rock. The agreement entered into between the company and former owners is that the company erect the mill, hoisting works, pump, etc., and work the mine for three months after the machinery is in place, and should they realize during that time a sufficient sum to pay for the machinery, they are then to pay Messrs. Gray, Richards and Watts $50,000 for the mine. In case the three months' operations do not prove profitable the company has the privilege of giving up the mine.

BRITISH COLUMBIA.

LILLOOET.—Kamloops *Sentinel*, Aug. 23: Jas. Nevins of St. Mary's creek has just commenced sluicing and in a few days will clean up. He has six men employed. There is a large gang of Chinese opposite Chimney creek who have built an extensive ditch costing them several thousand dollars. Their claim it is said pays from $3 to $4 per man.

COLORADO.

OPHIR'S ORE.—Silverton *Miner*, Aug. 23: Mr. Crim of Salt Lake City, one of the owners of the Grand View, has been in town for the past two weeks. Mr. Goddard of East Saginaw, also part owner, is expected here in a few days. This property has not been worked for several years, owing to a misunderstanding between the owners. The Silver Bell is working a force of 12 men and taking out high-grade ore. Tom Simons is packing the ore to the Burro Bridge, where it is loaded on the cars and sold to Duyckinck & Co. Olaf Nelson has taken a lease on the Terrible. This is the western extension of the Silver Bell, and is owned by K. Benson of Silverton. The Nevada is being worked by Mason & Douglas, who have a lease on the property and are working a force of 16 men. They are jigging the ore from the old workings of the mine. The Suffolk is shipping every day, and keeps five stamps going night and day. Holly & Smith have taken a lease on the Hidden Treasure. This is gold property, and a mill-run of ten tons will be made in a few days. Major McBernie is working a number of men on the Triangle. It is located near the Suffolk, and rich ore is being taken out. Robert Neely is foreman. Bob is an old-timer in Ophir, and is familiar with all the ore in the camp. No good ore is thrown away where Bob has charge. The Clara at Trout lake is shipping to Duyckinck & Co. They are working a large force of men. Mr. Rose of St. Louis is superintendent of the property, and James Herring is foreman. Jim is an old-timer in the San Juan. The San Bernardo, also near the Trout lake, is being worked by Messrs. Beattie, Mason & Douglas, who have a lease and bond on the property. Mr. Beattie is sheriff of San Miguel county.

MILLING FACILITIES. — Georgetown *Courier*, Aug. 24: Georgetown's milling facilities deserve renewed interest. The present mills possess a fortune in the way of water-rights, water-powers and franchises. Most of them are of an antiquated type of machinery, but the franchises are such as to make them very valuable. With the mines at Empire coming to the front, the strikes on Lincoln mountain and the older mines seeking a market for their concentrating ores, the mills should engage the attention of capitalists. The concentrators in operation show what can be done, although working under great disadvantage. If the capacity was increased, new machinery put in, milling interest would at once revive and build up the town, for with mills comes necessity for machinery and general supplies, for wage labor and that general diversity of industry without which no community can prosper.

DAKOTA.

MONITOR.—Deadwood *Pioneer*, Aug. 23: A gold brick, valued at about $3000, representing a partial cleanup at the Monitor for the first 20 days of August, was brought down yesterday. Final cleanup for the month will be made September 1st. Directors have held no meeting lately and it is not probable will get together before the first week in next month, when it is hoped and anticipated another dividend will be declared.

PYRITIC SMELTING.—Seth Bullock came in from Carbonate yesterday evening, and in conversation with a *Pioneer* reporter confirmed statement published elsewhere, that the Iron Hill smelter having turned out four carloads of bullion, was to shut down at 12 last night. Furnaces will be changed at once and the plant blown in again two weeks, which will be for a practical test of dry or pyritic smelting. That it can be successfully applied is beyond question, since the process has been in use in Germany for more than three centuries. At Portland, Maine, it is operated on ore at a cost of $1.50 per ton. That it is the best method yet hit upon for treatment of Black Hills refractory ores, since it saves the full assay value of both gold and silver, is everywhere acknowledged. Once practically demonstrated, as it will be at the Iron Hill, the prediction is ventured that a large plant will go up in Deadwood.

IDAHO.

ATLANTA.—Ketchum *Keystone*, Aug. 24: G. G. Adams, of Atlanta, came in from that camp Tuesday. Mr. Adams says that Atlanta bids fair to assume its old-time prominence as an ore-producing camp, for at no period since its discovery—a quarter of a century ago—has a more hopeful feeling prevailed. Mr. C. N. Miller, with his concentrating mill, has fully demonstrated that the low-grade ores of the camp can be treated at a good profit, which has led the Buffalo company and others to erect a new plant and adopt the same methods. The Tahoma company have a ten-stamp mill and four Frue vanners handling in the neighborhood of twenty tons of pulp each day. Mr. Rudolph Behren, the manager of the Buffalo company, is exerting himself to the utmost to get ready to crush ore as soon as possible. Aside from the corporations, there are many properties owned by individuals, among which may be mentioned the claim of Messrs. Gaetz & Walters, upon which they are erecting a five-stamp mill; those of Messrs. Biers & Motton, Judge Heath's and Mr. Geo. Tims, all more or less developed, and improving with each day's work. The ores of the district carry ruby, native silver and sulphurets, with gold in a free and sulphuret state, all admitting of being concentrated except the ruby. Work has been suspended for the present upon the Silver King mine at Sawtooth. All the miners but two have been discharged. Those two have been left in charge of the mine.

WAGONTOWN DISTRICT.—Cor. *Statesman*, Aug. 25: The De La Mar mill is finished and can be run by steam; and ore hauling has begun and the reduction of ore, sufficient to pay expenses, for the thorough development of the splendid mine will begin in a few days. Six men have been put on in addition to the regular prospecting force, and the stoping of ore is progressing briskly. Ludwig, who represents a wealthy Pittsburg syndicate, is driving a tunnel on the Stoddard mine, east of the Wilson mine. No big ore body has yet been encountered, but the lode holds its own and looks well. Sommercamp is the owner of a fine group of claims adjoining the Wilson group, and though he has spent a fortune in the development of his claims, he intends to work a force of half a dozen men this fall and winter, to still further develop them. Negotiations are pending for the purchase of some fine mining property in Florida mountain, owned by Knott.

LOWER CALIFORNIA.

PLACER MINING AGAIN.—*San Diegan*, Aug. 20: W. H. Smith, the oldest white settler at Ensenada, came up this morning on the steamer Dublan. He says the recent rains at the Alamo made digging easy and caused quite a general return to the placer mining. Scores of small nuggets were discovered and quite a number of good ones were picked up. This work, however, was only taken up by the camp followers. The mining companies are busily engaged in preparing for handling quartz. The El Paso Co. are putting up a ten-stamp mill which will be the best in the country. Twenty-five men are employed now setting up the machinery. At the Alamo three inches of rain fell in two hours.

MONTANA.

AT THE BLUE BIRD.—*Inter-Mountain*, Aug. 21: Work of getting ready to start a leaching plant at the Blue Bird is still progressing. The two buildings being put up to accommodate the new process are 116x52, and 25x25 feet in dimensions. The buildings are about completed. Progress just at present has been delayed by the non-arrival of the Oregon pine lumber which is to be used in the construction of the tanks. It is thought that it will be a month before everything is in readiness to start the leaching process. At the mine and mill everything is running as usual. The crosscut at the 600-foot level is still being driven to cut the vein, which is yet quite a distance away.

GRANITE MOUNTAIN.—Phillipsburg *Mail*, Aug. 23: The output for the week ending Aug. 22 was 57 bars of bullion, containing 80,500 ounces fine silver and 186 ounces fine gold.

COMBINATION CO.—Ten additional stamps are to be put in; also some roasters, which will enable them to work all the ore, instead of shipping it to Butte after concentrating, as they have always done. One hundred thousand brick for the new addition is being conveyed from Phillipsburg to Black Pine. A meeting of the trustees of the company was held in Butte last Monday evening, and when, after a thorough investigation, the recommendation of Supt. Akers was adopted, it was decided to put in a Brueckner furnace. It is claimed that this addition will save the company at least $1000 a month in transportation, working charges, etc., and the cost will not be over $6000.

LITTLE BLACKFOOT DISTRICT.—Judging from all reports from the Little Blackfoot district, it will soon be recognized as one of the first in the Territory. Ever since Angus A. McDonald, of Phillipsburg, and some other gentlemen purchased the Telegraph mine at that place last spring, other parties have gone into the camp and made investments, until now a great deal of work has been done. A mining man in from there this week says it is the most favorable outlook for a rich camp that he has ever seen.

THE LEADVILLE DISTRICT.—*New Northwest*, Aug. 23: A recent assay from T. J. Kelley's lead of hard carbonates in the new Leadville district, 12 miles southeast of Deer Lodge, shows 85 ounces of silver and 32 per cent lead. Other claims assay 26 ounces silver and 32 per cent lead, 46 ounces silver and 34 per cent lead, and 26¾ ounces silver and 32 per cent lead, etc. Constant accessions are being made to the population of the new camp and everything that shows up yellow is staked off into claims. Those who got in on the ground floor are confident they will some day have a camp equal to the original Leadville. Not enough work has yet been done, however, to fix the status of the district, though the showing is certainly good for the little development that has been made.

NEW MEXICO.

LEASING.—Silver City *Enterprise*, Aug. 24: Wm. Beall and Dan Casey, who are leasing on Solid Silver ground at Black Hawk, are taking out some good ore. They now have about three tons sacked, a part of which is worth $500 per ton. The new Humboldt mill at Lordsburg has started up and is running steadily. Milt Miller and James Dodd returned Tuesday from Socorro, where they went with a shipment of ore from the Alhambra mine. The shipment was an astonisher to the Rio Grande Smelting Co., all those connected with the plant declaring they had never before seen or handled such a lot of rich ore. It was so rich, in fact, that at one time the smelter people declined to purchase it, and the ore was sacked up for shipment to Denver, but later changed their mind and proceeded with the sampling, which was no easy job, as all of the ore averaged over $1 per pound, and the first grade, of which there was 1000 pounds, ran high into the thousands. It was decidedly the richest shipment of ore ever made from Grant county. After returning home the boys purchased C. G. Miller's interest in the mine for $5000 spot cash, after giving him his interest in the shipment.

CARLISLE.—The *Enterprise* is informed by a Carlisle gentleman that a strike of importance has been made in the Carlisle mine. The informant states that every assurance is favorable in regard to the Carlisle being a bonanza for years to come. He thinks it is decidedly the biggest mining camp in the Southwest. What was originally taken for the footwall has turned out to be only a "horse" or slab of porphyry. A cut has been run through the porphyry and into the new ore body for a distance of 15 feet without a break. The ore is said to be richer than that heretofore taken from the mine. Good ore has also been encountered at the 60-foot level, and at the 600-foot level the ore is of a much better grade than at the 500-foot level. Galena is coming in more as depth is obtained, the concentrates now running over 30 per cent lead, and it is thought that the concentrates can now be smelted at the mine, thus saving a large amount of money paid out for transportation. Four or five men employed in the new body of ore will be able to keep the 60 stamps running.

OREGON.

CORNUCOPIA.—Cor. Baker City *Democrat*, Aug. 24: The mining outlook for the camp was never more promising than at the present time. The hundreds of locations are being worked by their owners as far as the money will go, but in most instances it is very limited, and consequently many locations receive no attention further than assessment work. The ore of the camp is all about the same character and is of that class which requires a great deal of machinery to properly reduce it. Considerable of the ore carries free gold, but the major portion of the value is in sulphurets. There are several mines that have been worked constantly ever since the camp was first discovered, about five years ago, and they are no longer classed as prospects but are called mines and are entitled to the appellation in every sense of the word. Among them we might name the Red Jacket, Simmons Group, Last Chance, Companion, Union, Forest Queen, May Flower, Red Boy, Moonshine, May Queen, Wild Irishman, Estella, Comet, Monte Cristo, and others. These mines have undergone extensive development and are showing up well. There are many other locations that are just as promising but have not been sufficiently developed to prove their intrinsic value. It is surprising, with all the mineral in sight in this camp, that at the present time there is but one mill in operation and that a 20-stamp. There is plenty of ore on the dumps to keep 20 mills of the like capacity running for months. What is most needed is a large custom mill with all the necessary machinery for working the concentrates. There is plenty of water, and if Pine creek was properly utilized it would furnish power for mills of any magnitude. It is only a matter of time until the Oregon Gold M. Co. will be running their mill by water-power.

UTAH.

IMPROVEMENT.—Park *Record*, Aug. 24: It is indeed gratifying to learn of the continued improvement of the Comstock ledge. Only last Thursday another strike was made in the face of the tunnel where a second pay chute appeared. It is about 18 inches in width and is increasing; meanwhile the vein of galena and carbonates is holding its own. The character of this second pay chute is principally high-grade free-milling, and some of the fine streaks and bromides will assay way into the thousands in silver. The tunnel is following the big ledge on a nearly straight line and less water is encountered now in the face. The Comstock has abundant promises in store for the London stockholders, and also for the entire country west of Thanes canyon to Scott Hill.

AN IRON CANYON STRIKE.—A few days ago Thos. Roscamp and John Glenn made an important discovery by chance in the Golden Staff claim situated toward the head of Iron canyon, the Himalaya group being between this property and the summit of Scott Hill. They have the croppings of a fine ledge and the shaft being sunk on it gives encouragement of a future mine. The ledge contains a small seam of ore which will go well in silver and lead, with traces of gold.

ORE AND BULLION SHIPMENTS.—During the week the Ontario shipped 30 bars of bullion, containing 16,267.69 fine ounces of silver. For the week just ended the Mackintosh sampler received 589,080 pounds of Ontario ore; 368,360 of Daly; 135,160 of Mayflower No. 7 leasers'; 86,290 of Woodside concentrates from the Union concentrator; 44,390 of Woodside first-class ore; 33,030 of Woodside jiggings; and 10 000 pounds of Jupiter leasers' ore; total, 1,266,310 pounds.

MECHANICAL PROGRESS.

American-Made Files.

The history of the growth of the American industry of file manufacture is both interesting and instructive as showing what can be done in building up an industry and cheapening its products by a little well-timed "protection." Mr. Wm. H. Maher of the Toledo *Blade* tells in an interesting fashion how the mechanics' file has contributed to prove the universality of this law, as follows:

"There is scarcely any one tool," says Mr. Maher, "that is so generally met with as a file. The crippled wood-sawyer who comes to cut your wood depends upon his file to keep his poor old saw in order. It is found in the chest of the carpenter; it is the right hand of the machinist. The little stave factory in the woods and the magnificent locomotive works alike depend upon a file to do their work and keep their tools in order. The village blacksmith could do nothing without his rasp, and a cabinet-maker depends on his file as an engine depends on steam.

"So universally is the tool used, and so constantly are mechanics and manufacturers purchasing, that the prices are well known, and a brief glance at the history of American files may be of interest. I have been connected with the file trade for nearly 23 years, simply as a middleman, buying such goods as would sell easiest and were most in demand. I made a bill to-day of a certain size of cross-cut files at $1.44 per dozen. I then turned back to the sales-book of 1866, and discovered that the price charged then for the same size was $6.50 per dozen. This is a decline in the price calculated to make one's eyes open.

"In 1866 almost every file in stock and in use was of English manufacture. All files at that date were cut by hand. Machines for cutting had been patented and an immense factory built at Boston to manufacture by machinery, but the goods proved worthless, failure overtook the concern, and for several years the country was flooded with the bankrupt stock that was given away with difficulty. There was a heavy duty on files, for it was desirable that they should be made here, and small factories were springing up all over the land where hand-cut files were made.

"Notwithstanding the Boston failure, American mechanics were not content to give up the cutting of files by machinery, and between 1866 and 1870 factories were established at Providence, R. I., Middletown, N. Y., Beaver Falls and Philadelphia, Pa. These makers put their goods on the market on their merits, cutting under the English price, and warranting their work.

"A few years ago a file factory was started in Saginaw, Mich. The file trade of Northern Michigan, because of the immense sawing done, is very large. The home file was offered to Michigan men at the same price as the Eastern file. The disposition on the part of consumers was to give the home file the preference, and the Eastern makers saw their orders decrease. They did not propose to permit this, so they cut the price, in hopes of driving the new concern out of the field. The result of this cut was an immediate saving of about $500 per day to consumers of files, and the cutting has been going on from that day to this. So, then, in about 20 years, under our tariff laws, we have seen files reduced in cost from $6.50 per dozen to $1.44."

HOW SWORD-BLADES ARE MADE.—Sword-blades should be, and usually are, made and tempered so that they will chip a piece out of a stone without showing a nick upon their edges. This information is given by one who has been through the great sword manufactory at Solingen, Germany. He writes to a Pittsburg paper a long description of the methods used there. The steel, he says, is cut from bars into strips about 2½ inches wide, and of the required length, by a heavy cutting machine. These are carried into the adjoining forge-room, where each piece is heated white, hammered by steam so that about 20 blows fall upon every part of its surface, and then thrown into a barrel of water. Afterward these pieces are again heated in a great coke fire, and each goes through a set of rolls, which reduce it to something like the desired shape of the weapon. The rough margins are trimmed off the piece of steel in another machine, and there is left a piece of dirty, dark-blue metal shaped like a sword and ready for grinding. This is done on great stones, revolved and watered by machinery, the workmen having to be the most expert that can be obtained, as the whole fate of the sword is in their hands. It is afterward burnished on small wheels managed by boys from 12 to 16 years old, and when it has been prepared to receive the fittings of the handles, is ready for testing, which has to be done with great care. Any fault in the work is charged to the workman responsible for it, and he has to make it good. It is said that any blade which will not chip a piece out of a stone without showing a nick on itself is rejected.

FLEXIBLE METALLIC TUBING.—Considerable interest was shown at the Brussels Exposition in 1888 in a form of flexible metallic tubing exhibited by the Belgian and Colonial Flexible Metallic Tubing Co. of Brussels, Belgium. The tubing was formed by wrapping strips of metal spirally around a mandrel. The metal strips were bent over at both sides and a thin, narrow rubber band was inserted to prevent leakage. The tubes could be bent in any direction, were perfectly tight, and were claimed to possess great resistance to both internal and external pressures, and to be easily handled and repaired. They were designed to compete with rubber hose in its various applications, and, according to present accounts, have met with a fair share of popularity. The tubing shown at Brussels was of brass and a wide variety of sizes.

A NEW MACHINE FOR HORSESHOE NAILS has recently been invented by an Englishman which is referred to by an English paper as follows: 'A demonstration of the powers of a new machine for the production of horseshoe nails was given in London recently on behalf of Mr. Capewell, the inventor. Each machine will produce over 600 pounds of average-sized nails in the working day of ten hours, and one boy can fully attend to four machines. The nails themselves are produced direct from the cold steel bar, and are therefore even in temper throughout and uniform, while it is claimed for them that in their finish, tensile strength, holding power in chuck, and freedom from liability to fracture under the heads, they are without rival in the market. Their cost is but little over half that of nails made by other processes. The process itself is very simple. The end of a coil of steel bar or wire on a drum is put into the machine, which, automatically cutting pieces of the required length, passes them down through a series of dies, which draw and bevel them; they are then caught in slots in a revolving plate and pointed, headed and finally dropped—finished nails ready for use—without any hand labor whatever. Should any failure take place in any of these operations with any nail blank, the fault instantly throws the machine out of gear, while a danger signal marks the exact spot where it occurs. To remove the faulty blank and restart the machine is the matter of seconds only.

CHROMIUM STEEL.—A new metallurgical industry has recently been started by a well-known firm of chemical manufacturers. It is the extraction of the metal chromium from its ores, to be subsequently used in making steel for very special purposes, locally by the Steel Company of Scotland, and at Sheffield in making armor plates at the Atlas Works of Sir John Brown & Co. The chromium is found to impart to open-hearth and crucible steel a wonderful amount of tensile strength, and consequently chrome steel is likely to be of the very greatest service in the armor-plate industry.—*Iron and Coal Trades Review.*

TUBULAR STEEL SLEDS.—And still another use has been discovered for steel tubes. They will be manufactured into sleds. Small sleds for coasting, large sleds for heavy hauling and even sleighs can be thus manufactured, proving light, convenient and substantial. This will create still greater demand for small-sized pipe. It is said that a company has been chartered for the construction of tubular sleds, and that the material will be supplied by the National Tube Works at McKeesport, Pa.

A GREAT STEEL PLANT.—The steel plant of the Phœnix Iron Company of Philadelphia, which has been in course of erection for the last four months, is now reported as completed. The engines weigh 370,000 pounds, and the roll train weighs 400,000 pounds. This is the largest plant in the country, not excepting that at Pottsville. The plant is expected to turn out steel suitable for armoring cruisers for the Government and for making steel guns of any caliber.

ROADWAY ON IRON BRIDGES.—Sir A. Rendel, the Consulting Engineer of the Home Government of India, has recently recommended, on the ground of strength and economy, the covering of the main girders transversely with corrugated iron plates, which, he says, form (when ballasted) a much better and more durable roadway for traffic, and probably a cheaper one than planking, and at the same time contribute to the structural strength of the bridge.

A STEEL CHURCH.—A church made of cast Bessemer steel has just been constructed by an iron works at Hennegau in Germany. Its destination is the island of Manilla, where frequent earthquakes render a brick building unsafe. The weight of this steel church is 1600 tons, and it will, it is thought, from calculations made, be capable of resisting earthquakes of a very severe nature.

COMPARATIVE VALUE OF MANUFACTURED STEEL.—Some interesting and curious figures were given in a speech by Sir Daniel Adamson, before the Iron and Steel Institute, regarding the comparative value of a ton of manufactured steel. The value of a ton of steel in the shape of steel rails is, say, $22, but the wholesale price of a ton of steel hair springs for watches would be $200,000,000.

A SELF COUNTER SINKING SCREW is a novelty. It is simply fitted with cutting teeth on the under side or bevel of the head, which cut into the wood as the screw is driven home, thus enabling the head to counter-sink itself. The channels and the teeth are both wider as they near the top of the head, thereby allowing the sawdust to escape.

SCIENTIFIC PROGRESS.

Improvements in Sugar Manufacture.

If the accounts of inventions and improvements in sugar manufacture, which we are receiving from Germany, are reliable, there is much reason for believing that we are just upon the eve of a complete revolution in this great industry all over the world. A Philadelphia paper of late date has the following:

The first lignite sugar refinery in this country is about to be put into operation, and if it carries out the expectations of its projectors it may revolutionize the sugar industries of the world. The Keystone Sugar Refining Co. of this city has established a plant at Riverside on the Philadelphia, Wilmington & Baltimore railroad, just this side of Wilmington, and in a few days the machinery will be put in motion. The scheme is to utilize the waste from the molasses houses, known as "black-strap," and turn out an excellent grade of sugar.

The process is the invention of a man named Kleeman, a German, who has superintended the erection of the machinery at the Riverside refinery. He has one or two large refineries in Germany, which at present are the only ones in the world. The "black-strap" is thrown into a reservoir and thinned with water, and then large quantities of pulverized lignite are thrown in and mixed with the refuse molasses. The process of purifying then takes place, and after passing through a sort of press the lignite and sugar are separated, the lignite being turned out in blocks, which can be used as fuel. By this means there is absolutely no waste.

The lignite is a variety of coal, and the company at present is receiving a supply from Germany, although it is found in large quantities in this country. In Vermont and Alabama there are great fields of it, and deposits of it are found in some parts of New Jersey, but there it is of an inferior quality.

The "black-strap" is to be secured from molasses houses in this city. It has always been a problem puzzling the refiners to find some way of using this waste, but it never was solved until Mr. Kleeman invented his process. The "black-strap" formerly was shipped to Europe, where it was used for coloring cordials, making rum, and for other purposes, but the product has always been in excess of the demand.

Chemical Sugar.

Simultaneously with the above, which we clip from the Philadelphia *Record*, comes another report from Germany as follows:

Much scientific interest if not commercial value attaches to the recent production of chemical sugar in the laboratory of the University of Wurzburg. Glycerine was used as the starting-point in the experiments. After decomposition and treatment with various reagents, a colorless syrup was obtained, which, unlike saccharine, appears to be a genuine sugar, acting in every respect like ordinary natural sugar, except in being incapable of rotating a beam of polarized light. The discoverers, Fischer and Tafel, are now continuing their experiments with a view to giving the lacking optical activity to the new product, which they have named acrose.

MENTAL EVOLUTION.—The following paragraph is interesting and quite significant as showing the gradual advance which the human brain is making in its upward development: Dr. Dight, who is professor of anatomy in the American College of Beirut, Syria, has made a careful comparison of a collection of human skulls, which are stored away in an old monastery in the Kedron valley, midway between Jerusalem and the Dead sea, with skulls of the same race at the present day. The measurements show some significant differences. The Caucasian skull has, during the past 13 centuries, increased in circumference nearly two inches, and has gained in cranial capacity 3½ inches. There has been no increase in the width. The brain has gained in hight and length—*i. e.*, there has been a development of the upper and anterior parts of the brain, the parts which we should expect to increase by education and civilization, as they preside over the moral and intellectual functions. The lower portions of the brain, in which the lower or more selfish propensities are centered, and which give breadth to the head, have, in the march of the centuries, failed to grow as rapidly as the higher brain centers; hence the non-increase in the width of our skulls.

AN INTERESTING PLANT.—We find the following in an exchange, without, however, any given parentage: Last spring a lady living on Mount Bowdoin found 17 four-leaved and one six-leaved clover, all on one plant. It was growing on rooky soil, and she pulled it up, took it home and set it out in her garden. It flourished, but did not increase in size, the roots refusing to spread. All summer it bore four-leaved clover, and in the autumn it was transplanted in a small box and taken indoors. Since that time it has borne 37 four-leaved and a dozen five-leaved clovers.

A REMARKABLE BATTERY.—The Italian papers report that an electric theodolite, which indicates with mathematical precision the position of an enemy's ship, whether at anchor or in movement, has been set up at Maddalena. The battery, which defends the Island of Caprera, is situated in a valley separated from the sea by a high hill. On this is placed electric machinery communicating with the battery. There is also a small "panorama" indicating the position of hostile ships, their direction, their distance from the battery, and the point to which the firing should be directed. The gunners do not see the enemy, but aim high, the balls passing over the hill. On the other hand, the enemy, having no means of ascertaining the situation of the hidden battery, cannot return the fire. The inventor of the machine is one of the heads in the engineers' department of the army, and has gone to Maddalena to direct the installation of the machinery.

Motions of the Earth.

The motions of the earth are somewhat complicated, but readily understood, governed and explained by well-known laws. First, the earth revolves on its axis in 23 hours, 56 minutes and 4 seconds. This time is required for one rotation from a star round to the same star again. The revolution is therefore called a sidereal day. While the earth has been turning on her axis she has been advancing in her orbit, and it will take her about four minutes longer to come to the same position in regard to the sun which it occupied three days before. This adding four minutes to the length of the sidereal day gives 24 hours for the solar day. The time of the axial rotation has not varied the hundredth part of a second in 2000 years. It may, therefore, be considered as invariable, and is consequently adopted as a fundamental unit in astronomical measurement.

The earth revolves in her orbit around the sun in 365.26 days, giving another standard measure of time—the length of the year. The velocity of the earth in her orbit is almost incomprehensible, for the huge sphere spins along at the average rate of 18 miles a second. The earth's orbital revolution and the inclination of her axis to the plane of the ecliptic cause the changes of the seasons and the varying length of day and night.

Precession of the Equinoxes.

The earth has a still more complicated motion, known as the precession of the equinoxes. It consists of a wabbling motion of the pole of the heavens around the pole of the ecliptic in a small circle requiring 25,000 years to complete. It is caused by the attraction of the sun and moon upon the earth at the equator. Consequently ecliptic and equator do not cross at the same point, but the equinoctial falls back each year 50 seconds of a degree. One effect of this movement is to change the polar star, for whatever part of the heavens the pole points the nearest star to, that point is the polar star. The present polar star will no longer enjoy that distinction 3000 years hence, and the brilliant Vega will be the polar star 12,000 years hence.

The earth is also moving through space. The sun, carrying with him the planets, satellites, comets and meteoric bodies following in his train, is hastening toward a point in the constellation Hercules at the rapid pace of 20,000 miles an hour. It might seem that, traveling at this rate, the goal must soon be reached.

Such, however, is the inconceivable distance of the stars that more than a million years must pass before our sun and his family, at their present rate of travel, have spanned the depths of space that intervene between the shining suns of Hercules.

AN ELECTRIC PLANT.—According to *Nature* a curious growth—a strange plant has recently been discovered in India, which possesses to a very high degree astonishing magnetic power. The hand which breaks a leaf from it receives immediately a shock equal to that which is produced by the conductor of an induction coil. At a distance of six meters a magnetic needle is affected by it, and it will be quite deranged if brought near. The energy of this singular influence varies with the hour of the day. All powerful about 2 o'clock in the afternoon, it is absolutely annulled during the night. At the times of storm its intensity augments to striking proportions. During rain the plant seems to succumb and bends its head during a thunder shower; it remains then without force or virtue even if one should shelter it with an umbrella. No shock is felt at that time in breaking the leaves and the needle is unaffected beside it. One never by chance sees a bird or an insect alight on the electric plant; an instinct seems to warn them that they would find there sudden death. It is also important to remark that where it grows none of the magnetic metals are found; neither iron, nor cobalt, nor nickel, an undeniable proof that the electric force belongs exclusively to the plant. Light and heat, phosphorescence, magnetism, electricity, how many mysteries and botanical problems does this wonderful Indian plant conceal within its leaf and flower?

SAND SLOPES.—A Mr. Bolton in recent visits to Egypt and Mount Sinai measured the maximum angle at which dry sand will lie at rest, and found it to be from 31 to 32 degrees; higher than this, it will move down the slope. This does not accord with the well-known formula in text-books.

THE new anti-sawdust law, which goes into effect Sept. 1st, is to be strictly enforced by the State Fish Commissioners.

THE RECORD of meteorological observations kept at the Paris observatory was begun in 1666.

ELECTRICITY.

Definition of Electrical Terms.

Electricity having become so large a factor in every-day reading, our readers who are not thoroughly posted will, no doubt, be pleased to study carefully the following definitions of electrical terms, which we clip from *Power and Steam*, N. Y.:

The manner in which work is done by a current of electricity traversing the wire is in some respects analogous to the manner in which work is done by a current of water flowing in a pipe. If the pipe is horizontal the water has no tendency to flow one way or the other, and can do no work. If the pipe be raised to a vertical position the water will flow out at the lower end, and if it there operated upon a perfect water-wheel belted to a perfect pump, enough work would be done by the fall of water to raise the same water to again fill the pipe.

The ability which the water has when in an elevated position to do work when falling is called its potential.

Electricity, like water, does work by virtue of its potential. There is a difference, however, between the potential of water and that of electricity. When the potential of water has expended itself in useful work we still have the water just the same as before, but when the potential of electricity has expended itself in work the electricity vanishes absolutely. We have no knowledge as to what has become of it.

Difference of potential is the difference between any given potential and another potential with which it may compare.

In dealing with electricity, difference of potential is called electro-motive force. It is usually written E. M. F. The unit of E. M. F. is the volt. Its value is purely arbitrary, but fixed. One volt will force one ampere of current through one ohm of electrical resistance.

Electrical resistance is that which impedes the flow of electricity. It is a property possessed by all substances to a greater or less degree. The unit of electrical resistance is the ohm, which in formulæ is usually symbolized by R. The value of the ohm is not absolutely known, but in 1886 electricians agreed to consider it for ten years as equal to the resistance offered to a current of electricity by a column of pure mercury one square centimeter in section and 106 centimeters long, at the temperature of melting ice. A round copper wire of 95 per cent conductivity, one-thousandth of an inch in diameter and one foot long, has a resistance of about 10.9 ohms. One ohm is that resistance through which one ampere of current will flow at a pressure of one volt E. M. F.

The rate of flow or current of electricity is measured in amperes.

One ampere is that quantity of electricity which flows per second through one ohm of resistance when impelled by one volt of E. M. F. One ampere through a silver-plating bath deposits 0.017253 grains of silver per second. Through a copper bath it will deposit 0.005084 grains of copper per second. The rate of deposition of silver or copper is one of the most accurate and reliable means of ascertaining current strength.

The unit of electro-dynamic quantity is the coulomb, and is of the value of one ampere of current. For example, a current of one ampere in one second would transmit one coulomb. A current of ten amperes would transmit in two seconds 20 coulombs. A current of 80 amperes in one minute transmits $80 \times 60 = 4800$ coulombs. The relations which exist between E. M. F., resistance and current are known as Ohm's law. Its simplest expressions are as follows:

In an electrical circuit the current in amperes may be found by dividing the E. M. F. in volts by the resistance in ohms.

From the last three proportions it may be seen that in a given resistance an increase of E. M. F. must be accompanied by a proportional increase of current; or an increase of current must be accompanied by a proportional increase of E. M. F.; but an increase of resistance will be accompanied by a proportional increase of E. M. F., or a proportional decrease of current; and a decrease of resistance will be accompanied by a proportional decrease of E. M. F. or a proportional increase of current.

According to these relations, it is seen that C. and R. are each the reciprocal of the other, multiplied by E.; that is to say, that C. and R. limit and define each other where E. is a fixed quantity.

The joule is the unit of energy, and is the work expended in forcing one coulomb through one ohm; it is equal to .7373 foot-pound.

In a given resistance, energy, such as work or heat, varies as the square of the current or of the electro-motive force; that is, by doubling the E. M. F. the energy becomes four times as great; by trebling the E. M. F. the energy is nine times as great.

Power is the rate of doing work, and is proportional to the E. M. F. multiplied by the current. The watt is the unit of electrical power. One volt multiplied by one ampere equals one watt. Power also varies to the square of the E. M. F.

It is evident that, by doubling the current in a fixed resistance, the E. M. F. must be doubled. Hence it follows that the power varies as to the square of the current. That is, by doubling the C. or E. M. F. the power is four times as great; by trebling the C. or E. M. F. the power is nine times as great.

One electrical horse-power equals 746 watts. That is to say, a current of one ampere and 746 volts would be one electrical horse-power.

And one horse-power expended wholly in producing electric energy would generate one ampere in 746 ohms resistance, or 746 amperes in one ohm resistance.

In reading French text-books, it must be remembered that the "cheval vapeur," or French horse-power, equals only 736 watts.

Work varies as to the quantity of electricity and the E. M. F. That is to say, the same amount of work is done when one coulomb falls one volt, whether it falls quickly or slowly; in other words, whether it is obstructed by a small or a large resistance. But one coulomb in passing one ohm will do little or much work, in proportion as it passes quickly or slowly. Thus, if a coulomb goes against an ohm in three seconds, it goes at the rate of one-third of an ampere, and consequently at a pressure of one-third of a volt, and a coulomb and a third of a volt means one-third of a joule of work. But if the same coulomb were to pass in a twentieth of a second, it would go at the rate of 20 amperes, and consequently 20 volts; in this case it would obviously do 20 joules of work.

E. M. F. is distributed according to the resistance of the various parts of the circuit, except where there is a counter E. M. F.

Counter E. M. F. is like back pressure in hydraulics. Thus, to find the available E. M. F., or the resulting current against a resistance where there is a counter E. M. F., the counter E. M. F. must be deducted.

GOOD HEALTH.

Living for Centuries.

Everybody is more or less excited just now over Brown-Sequard's supposed discovery of the elixir of life, the doctors are experimenting with the mysterious rejuvenator, and all the old people are fondly looking forward to the hour when they will throw away their spectacles and canes, rheumatism and lumbago, and in the flush of youth begin the drama of life over again. The pleasing delusion, if such it should prove to be, is by no means a novel one. More than once has the world gone wild over the Rosicrucian dream of physical immortality. There have always been a few occult philosophers who believed that the secret of longevity possessed by the old Silurians before the flood had not been lost; that Noah brought it safely over the deluge in the Ark, and that it was for ages preserved among the mysteries of Egypt.

The theosophists, and they are almost as numerous in our community as blackberries, believe there are men now actually existing who have by the observance of certain occult rules attained the age of two, three, four and even six hundred years. These adepts, as they are called, are rarely ever seen, as their bodies have become so etherealized and their tastes so exquisitely refined that they cannot endure our ordinary modes of life. They live in select brotherhoods in the quiet and seclusion of mountains and never meddle with mundane affairs. They are merely distant spectators of what is passing in the world, and as they make no disciples, have no confidants, obey all codes, conform to all laws, they pass through the world unnoticed, and only a few chelas or initiates are aware of their existence. There are many who believe that Nicolas Flamel, a Hermetic philosopher of the fourteenth century, is still alive and was actually seen as late as the end of the last century. The strange story of his life, as narrated by Sieur Paul Lucas, who claims to have met him at Broussa, is enough to form a plot for Rider Haggard. The legend of the "Wandering Jew" by Croly, "Zanoni" and the "Strange Story" by Bulwer are three specimens of the way this enchanting fancy has become embalmed in literature.

In the year 1883 the Putnams published a little book by Mr. Hyland C. Kirk, entitled the "Possibility of not Dying," that for a short time excited the attention of the curious. About a year ago, Dr. William A. Hammond gave the public several papers in which he gravely stated that there were no physiological reasons why a man should not live forever. He contended that the body of a man differs from any inorganic machine in the fact that it possesses the power of self-repair. In the steam engine, for instance, the fuel that serves for the production of force can do nothing toward the repair of the parts worn by friction, and hence every day the engine becomes less perfect till at last it is worn out. But the animal body is no such machine. Here the material which serves for the production of force is assimilated according to the character of the organs and parts that require it. There is a constant change going on, the hair of yesterday is not the hair of to-day, and the muscles that extended the arm an hour ago are not now identically the same. The old material passes away and new material takes the place. Now, just so long as this double action, this law of flux and reflux, balance each other, life continues. Were it possible to so adjust waste and repair that neither would be in excess, there is no reason why life, if protected from accidents, may not continue indefinitely. Eternity is long, and Dr. Hammond, who certainly has won some distinction as a physiologist, predicts that some time humanity is sure to discover the secret of prolonging life for centuries, if not forever.

At present it hardly seems possible that human knowledge can progress so far. We would be willing to compromise at say, 300 years, but be all this as it may, one thing is certain, that civilization is lengthening the average duration of life. Our sanitary knowledge and our knowledge of the means of preventing disease are augmented day by day, until now, in many respects, they are quite perfect. Our list of preventable diseases is already a long one; the almost complete suppression of cholera and smallpox, to say nothing of the absolute abolition in all civilized lands of the plague, blackdeath, sweating sickness, and other malignant diseases that once dug graveyards in a day, are only prophetic of still greater triumphs of the healing art. As a result, the life of a generation has increased six years in the last half century, and there is hardly any reason to doubt that the old Bible promise of three score years and ten may not some day become the average duration of human life.

REGULATING ONE'S WEIGHT.—To increase the weight: Eat to the extent of satisfying a natural appetite, of fat meats, butter, cream, milk, cocoa, chocolate, bread, potatoes, peas, parsnips, carrots, beets, farinaceous food, or Indian corn, rice, tapioca, sago, cornstarch, pastry, custards, oatmeal, sugar, sweet wines, and ale. Avoid acids. Exercise as little as possible, sleep all you can, and don't worry or fret. To reduce the weight: Eat, to the extent of satisfying a natural appetite, of lean meat, poultry, game, eggs, milk moderately, green vegetables, turnips, succulent fruits, tea or coffee. Drink lime juice, lemonade, and acid drinks. Avoid fat, butter, cream, sugar, pastry, rice, sago, tapioca, cornstarch, potatoes, carrots, beets, parsnips and sweet wines. Exercise freely.—*Kansas City Medical Index.*

TURPENTINE BATHS FOR RHEUMATIC PAINS.—Make a concentrated emulsion of black soap, 200 grammes; add thereto 100 or 150 grammes of turpentine, and shake the whole vigorously until a beautiful creamy emulsion is obtained. For a bath take half of this mixture, which possesses an agreeable pine odor. After remaining in the bath a quarter of an hour, the patient should get into bed, when a prickling sensation, not disagreeable, however, is felt over the entire body; then, after a nap, he awakens with marked diminution of rheumatic pains.—*Practical Medicine.*

FEMALE PHYSICIANS.—The question of female physicians has been settled in Russia in the affirmative, with the stipulation that ladies shall only attend on adults of their own sex, and on children of both sexes.

REMEDIES.—There are about 11,000 remedies mentioned in the 15th edition of the "United States Dispensatory." Each ill that flesh is heir to must be more than well drugged.

USEFUL INFORMATION.

What Salt Will Do.

Salt in whitewash will make it stick better.

Wash the mica of the stove doors with salt and vinegar.

Brasswork can be kept beautifully bright by occasionally rubbing with salt and vinegar.

Damp salt will remove the discoloration of cups and saucers caused by tea and careless washing.

When broiling a steak, throw a little salt on the coals and the blaze from dripping fat will not annoy.

To clean willow furniture, use salt and water. Apply it with a nail-brush, scrub well and dry thoroughly.

If, after having a tooth pulled, the mouth is filled with salt and water, it will allay the danger of having a hemorrhage.

Salt as a tooth-powder is better than almost anything that can be bought. It keeps the teeth brilliantly white and the gums hard and rosy.

Carpets may be greatly brightened by first sweeping thoroughly and then going over them with a clean cloth and clear salt and water. Use a cupful of coarse salt to a large basin of water.

If the feet are tender or painful after long standing or walking, great relief can be had by bathing them in salt and water. A handful of salt to a gallon of water is the right proportion. Have the water as hot as can comfortably be borne.

TREE POISON.—An invention has been patented in New Zealand and in the other colonies which, if it does all that is claimed for it, will revolutionize the settlement of bush lands. It is a composition which, when trees are inoculated with it, mingles itself with the sap and circulates through every branch and leaf, utterly destroying the life and rendering the standing tree in three months' time dead and rotten, and so highly inflammable that when fired it burns away literally root and branch, for the fire creeps even down the roots into the ground, consuming them so thoroughly that the land can be plowed afterward. It is available also for old stumps, thus doing in a month what Nature takes years to accomplish. The process of inoculation is simplicity itself, requiring little labor. It is simply the boring of a hole about six inches into the tree with an inch auger, filling with composition and afterward plugging with cork, tough clay, or other suitable substance. It has had several trials, and has done effectual work in all cases, in one instance 700 acres having been cleared with it, every tree being successfully dealt with. It is also very inexpensive, not costing more than a few pence even for a large tree.

PRESERVING FRUIT IN SAND.—It is said that the Italians have a method of preserving citrus fruits in sand. An excavation of from four to seven feet is made, and a board floor put in it. Upon this floor about three inches of clear dry sand is placed. The fruit (orange or lemon) is carefully cut from the tree and wrapped in tissue paper. The fruit is then laid upon the sand in such a manner that the wraps do not touch each other. Three inches more of the sand is then spread on the oranges, and another layer then put down in the same manner as the first, and so on, until there are three tiers of either. If more than three tiers are laid down the underneath oranges are crushed. Sand to the depth of seven or eight inches is then spread over the whole. Oranges are frequently kept for months by this process and kindred methods. All authorities are agreed that oranges and lemons, which are intended to be preserved, should be cut, not torn, from the tree. A similar method has been adopted by a grower of oranges in South Africa, and the fruit comes out of the "silo," as he calls it, in famous condition, at a time when oranges are scarce and yield good prices. Sweet potatoes may be preserved in the same manner.

WHAT BECOMES OF ALL THE PAPER?—There are over 1000 paper-pulp mills in constant operation in the United States, and the question is often asked: "What becomes of all the paper which is manufactured from this pulp?" The 15,000 different newspaper publications, daily, weekly and monthly, must use immense quantities. The Century Company alone takes nearly 200 tons a month for its publications. Harper & Brothers take 25,000 reams, and Robert Bonner 10,000 reams at a time. Two cheap-literature firms buy $500,000 worth of paper. One patent-medicine firm buys $300,000 worth of paper every year. As we have before said, there are more paper-mills, running more machines, in the United States than in any other country in the world. Germany has nearly as many, but no other country has half as many.

TO DISTINGUISH A GENUINE DIAMOND.—It is said that an expert is no longer required to tell whether a diamond is genuine or not. The test is simple, and can be made in any place and in a moment. All you need is a piece of paper and a lead pencil. With the latter make a small dot on the paper, then look at it through the diamond. If you can see but one dot you can depend upon it that the stone is genuine, but if the mark is scattered, or shows more than one, you will be perfectly safe in refusing to pay ten cents for a stone that may be offered you at $500. Of course a diamond to be subjected to such an examination must either be without its setting, or so mounted that the light will pass through it perpendicularly.

SAN FRANCISCO A RICH CITY.—The total indebtedness of this city, according to the annual report of the Auditor, is $902,811.11. This in itself is a remarkably fine showing for a municipality as large and progressive as San Francisco, but when compared with the total assets the indebtedness is astonishingly insignificant. The present value of city property is estimated at $50,000,000, and includes both City Halls, jails, reformatory institutions, engine and school houses and lots, outside lands, water lots, parks, and all the various apparatus and furnishings of all the city institutions. Most of the landed property of the city is growing in value constantly, so that the assets will keep on increasing.

ONE OF THE LATEST NOVELTIES is a window in umbrellas. This window consists of a small oval piece of glass with a silver or brass frame, which is easily mounted in a rib of the umbrella, while it is fixed to the silk by sewing it through the little perforated holes in the frame. These windows can be placed in new or old umbrellas in a manner which will not injure the fabric in the least. As to whether the umbrella will roll up tightly has not, however, been made apparent. By the use of such a contrivance, unpleasant collisions on rainy days may be avoided and many hard words between pedestrians saved.

A PECULIAR-SHAPED POTATO.—Potatoes often assume most peculiar shapes. S. Hodapp of Isleton has sent to the *Call* of this city a potato which for oddness of shape it would be difficult to find a mate to. The potato weighs about a pound and a half and resembles perfectly a small dog sitting on its haunches, with its forepaws outstretched. The only malformation is in the head, the forehead extending upward to a rather disproportionate hight. Altogether the potato is a genuine freak of nature.

TO SCATTER A CROWD.—A new way to scatter a crowd has been discovered. A man who found himself hemmed in by a dense throng near State and Washington streets, Boston, recently, while the circus procession was passing, pulled a bottle of ammonia from his pocket and spilled the contents promiscuously about. He had the entire sidewalk to himself in less than a minute.

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W. B. EWER.....SENIOR EDITOR

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SAN FRANCISCO:
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Business Announcements.

[NEW THIS ISSUE.]

Sheathing Lath—John F. Byxbee.

☞ *See Advertising Columns.*

Passing Events.

The Sierra Buttes mine, Sierra City, after running successfully for over 30 years, closed down this week. The mine belongs to the same English company that owns the Plumas-Eureka, Plumas county, and the Uncle Sam, Shasta county. The Sierra Buttes has had poor ore for the past two years. It was the most important mine at Sierra City, employing a large number of men.

The official trial trip of the cruiser Charleston is reported as successful, and it is expected that the vessel will be accepted by the Government. She developed high speed, though the horse-power did not quite come up to requirements.

The Commonwealth mine, Tuscarora, has made its last bullion shipment for the present and until another system of ore reduction is employed. Great numbers of miners have left the camp in consequence of the shut-down.

The Golden Gate river-bed claim on the Feather has turned the river into its new flume and in a few days will test the gravel in the bed of the river. This is very close to the old Cape claim, which is famous among miners for its richness.

Margins on Mining Stocks.

An important decision was rendered the past week by Judge Hoge in the case of Carlson vs. Goldman. Mrs. Carlson brought suit against Goldman to recover $600 paid on account for purchases of mining stocks on margin. The evidence went to show that she paid Goldman & Co. the money with which to purchase the stock, and failing to make good her margin, caused by a decline in the market price of the stock, she was sold out. Her counsel relied on the section of the Constitution which provides that all contracts for moneys paid for purchases and sales of stocks on margin shall be void and the payee may recover back the amount.

In deciding the case, Judge Hoge stated that from the evidence he did not think this case within the constitutional provisions. Says the Judge:

There has been, in fact, no sale on margin by Goldman. He was shown to be operating only as plaintiff's broker, he agreeing to advance the money necessary to make the purchase and plaintiff agreeing to pay from time to time. The contract of sale is perfectly concluded and the title to the stocks vests fully in the plaintiff. She could control them, order them sold at any time, and the amount they bring goes first to compensate the broker for his advances and the balance is paid over to her. The court thinks the transaction between Mrs. Carlson and the broker was a fair business proposition, in which one man acting as broker and agent for another agrees to make advances and charge interest; the other agrees to pay interest and to pay from time to time and does so. This is plainly not within the intended prohibitions of the gambling transactions known as buying and selling stocks on margin, which were designed to be checked by the constitutional provisions cited. Judgment is accordingly given for the defendant.

In deciding the case, it will be seen that Judge Hoge virtually decides another point that has been in controversy, viz., the legality of voting at the annual elections of incorporated companies by proxy of stock not owned or controlled by the person giving the proxy.

River Mining.

We had a call this week from Mr. S. N. Harris, superintendent of the Golden Gate Alluvial Syndicate which is about to work a section of the Feather river near Oroville. By next week it is expected that they will be able to begin the work in the bed of the river. A sub-flume is now being built for the seepage, the big flume having been completed and the water turned in. The flume carries the whole of the water of the river. Martin elevators will be used for pumping, and afterward for raising the gravel.

This claim is principally owned by English capital, who furnished the money for building the dam, flumes, etc. Mr. Harris and Major McLaughlin are part owners. The foot dam of the mining ground just laps on to the famous old Cape claim which yielded such enormous amounts of gold in early days.

The flume in the Golden Gate is a very large one. It is on a grade of one inch to 16 feet. At the head it is 50 feet wide and six feet deep, narrowing in width in 500 feet to 32 feet, and so continuing for 2800 feet farther, the last 2800 feet being five feet deep. The flume carries now 60,000 miners' inches of water with a depth of two feet carrying the whole river at its present stage.

There is a crib dam 50 feet high with a 40 foot waste-way, 10 feet deep, which will take a pretty good rise of the river. The first rise will not wash them out, as is apt to be the case with many of these river dams. Every precaution has been taken to stand a good rise without danger. It often happens that river miners can get in a month or two months' more work if they can stand the first rise. This dam is built to stand any ordinary winter.

The company will have quite a stretch of river-bed to work, and it is the expectation to work it all out in the next three months. The gravel is supposed to be from six to eight feet deep. We shall shortly give a detailed description of this large flume which has several peculiarities that will interest river miners.

THE ancient beach of Mono lake is about 700 feet above the present surface of the lake. It is a far greater elevation than any other lake margin in the United States.

GRAVEL containing gold in paying quantities is said to have recently been discovered at the head of Mill creek, Washoe county, Nev.

The Mining Bureau Fund.

It will be remembered that the last Legislature made an appropriation of $100,000 for the support of the State Mining Bureau, with the provision that a certain proportion should be expended in the field. When, however, application was made to State Controller Dunn for certain moneys out of this appropriation, he refused payment on the ground that the bill making the appropriation was improperly drawn, and there was nothing to indicate from what fund he was to pay. He therefore declined to pay the bills of the bureau. One man who had furnished supplies to the bureau on being refused payment asked the Supreme Court to issue a writ of mandate compelling the State Controller to pay his account. This has been under advisement for some time, but this week the Supreme Court issued the mandate instructing the Controller to pay the amount. The issuance of this writ sets the matter in controversy at rest and practically declares legal the appropriation for the bureau.

A couple of months' valuable time has been lost this summer, for the bureau has had no money with which to work, and most of the employes have been discharged. State Mineralogist Irelan will, however, make up for the lost time as best he can, and as soon as possible will have a corps of assistants at work in the field. It is understood that several branches connected with the objects of the bureau will be thoroughly examined and reported on, aside from the ordinary routine work. With the experience he has gained in field work in the past two years, Mr. Irelan will doubtless be able to give the public an exceptionally useful and practical report. He has personally visited most of the mining regions of the State, and familiarized himself with the wants of the mining community. Many localities will be described in more detail than has been the case in former reports, as the amount of the appropriation is sufficient to enable him to employ as many assistants as may be necessary.

The Railroads and Mineral Land.

A test suit has been brought in the U. S. District Court, Northern District of California, entitled Geo. H. Francoein vs. Oscar Newhouse, which involves the title to the Eagle Bird quartz mine, lot 52, township 17, north range 11 east, section 13, Mt. Diablo meridian, Marysville Land District.

The plaintiff claims title under the grant to the C. P. R. R., and the defendant claims by location under the U. S. mining laws and U. S. patent which has been issued to him. The railroad company wants to go behind the U. S. patent. It claims the title to the land patented was vested in the R. R. Co. by virtue of its grant from Congress and the land was returned as agricultural, not mineral. The question is whether the mineral went to the railroad company or not. The miners claim that the land did not pass to the railroad company, but being mineral was exempted from the grant, and that the title does not vest in the railroad company until patent issues. In this case no patent has issued to the company, but one has issued to the mine-owner. This test case involves title to a tract of land 72 miles long by 20 wide, in which are included some valuable mineral properties. There are a number of cases pending in the U. S. Court in which the same question is involved.

The Mechanics' Fair.

The opening exercises at the Grand Opera-house Tuesday afternoon were well attended. Pres. Kerr in his introductory remarks said that the Institute now has 4000 members, a library of 50,000 volumes, and property worth net $1,000,000. Irving M. Scott delivered an oration tracing the development of industrial arts and civilization, from remote antiquity to the present day, which is commended as instructive and entertaining throughout.

In the evening the doors of the Pavilion were thrown open, and thousands of visitors enjoyed the excellent music and inspected such of the exhibits as were already in their places.

F. A. HUNTINGTON, the manufacturer of the Huntington mill and other mining machinery, has removed from his old place on Fremont street, near Mission, to No. 213 First street, where he has better facilities and more room.

The Elevators of the Eiffel Tower.

(*Continued from page 161*)

two extremities of the *palonniers*, and support the elevator-cage, *B*, in passing over the pulies fixed at the summit of the tower. Two of these cables are attached to the cage itself, and the other two are fixed upon the *palonnier*, at the center of which the cage is suspended.

With a surface of 14 square meters, the cages can accommodate 63 persons and transport 750 in an hour, the duration of each trip of ascent and descent being five minutes. The weight of each cage loaded is 8000 kilogrammes, 4000 kilogr. for the cage itself, and 4000 for the passengers. Each cage going only one-half of the whole distance to be traversed, a change takes place at the intermediate floor, by two distinct roads, which permits great celerity in the service.

Over all the distance traveled, the two pistons are protected by a hollow cast-iron column, affording an opening for the passage of the *palonnier* and provided with several bearings serving for guidance and against which the piston can find support in the event it should be necessary. The suspension cables of the cage *B* pass through the same column.

On all the hight comprised, on the other hand, between the second story and the intermediate floor, the cages are guided by two cast-iron columns like the former, which inclose also and protect the suspension cables of cage *B*.

The means of transmission; pistons and cables, as is seen, are protected by sheaths, except the cables of cage *B*, which are fixed upon the cross-beams of the tower by curtain-bands in the upper part.

If we consider the operation and movement of the cages, we ascertain that four points are presented. 1. The cage *A* is empty and cage *B* only is loaded. 2. The cages *A* and *B* are both loaded. 3. The two cages are empty. 4. Cage *A* only is loaded. Examining the first and fourth cases, M. Grosclaude, Engineer of Arts and Manufactures, studies the weight which it is necessary to give to the pistons. Admitting that the weight of each cage will be 4000 kilogr., the weight of water displaced by meter for the two pistons would be 160 kilogr. the weight of the passengers 4000 kilogr. and the action due to friction 2400 kilogr. In the first case the system is put in motion with pistons of 19,200 kilogr.; in the fourth, the total section of the pistons being 1600 square centimeters, the pressure of water is 8 kilogr. per square centimeter. The ascent of cage *B*, which corresponds to the descent of cage *A*, is systematically regulated. The pistons are composed of two tubular parts, one of steel, the other of iron, and each weighs 9600 kilogr. The upper portion is formed of a steel tube 60 meters in length, weighing 3900 kilogr. The difference, 9600 – 3900 = 5700, represents the weight of the lower portions in iron.

A distributer also feeds the two cylinders, thus assuring in each of them an equal admission, giving for the pistons equal displacements. A reservoir of a capacity of about 20,000 liters at the top of the tower feeds this distributer. The water is led into the reservoir by two pumps of 25 liters each, placed at the lower part of the tower and raising the water to a hight of about 276 meters. The escapement water from the cylinders returning to the pumps comes upon the pistons with a pressure corresponding to a hight of 196 meters; the actual hight to which it is necessary to raise the water is then not more than 276—196 = 80 meters. In reality, the force to develop is a little greater, because of the loss of load. Generally the two pumps work together; they work separately only when the visitors are few.

The descent of cage *B*, if necessary, can be stopped by means of a resting brake, upon the helicoidal principle. This brake system is simple and ingenious. Each cage is guided toward its summit by breasts or teats bearing upon vertical slides and terminated at their lower part by conical bearings. At the same time that the cage moves in the cylinders forming the support of the slides, blocks gliding in helicoidal grooves present at their summit an evident conique corresponding to the conical bearing which we have indicated upon the breasts. The blocks and the breasts or teats being traversed by the cables if the latter should break, the blocks would stop in their sheaves, and support by means of the breasts the weight of the cage.

Working a Coal Mine in China.

The Tong colliery is about 80 miles northeast of Tientsin, China. The coal-beds have a dip south of about 45°, and are interstratified with sandstone, shale, indurated clay, and fireclay. Of the 17 beds discovered, nine are workable. The coal is bituminous. The floor of the coal-bed is invariably fire-clay, which is full of fossil stigmaria and calamites, showing it to have been the ancient soil of this carboniferous vegetation. The mine and the methods of working were described by J. M. Silliman before the American Institute of Mining Engineers some time since. Fig. 1 of the cuts is a map of the district. Fig. 2 shows a vertical transverse section through the coal-bed. Figs. 3 and 4 show the two shafts. These shafts are each 14 feet in diameter and are 100 feet apart. Shaft No. 1 is the downcast (560 feet deep) and No. 2 is the upcast. They are walled up with limestone, the stones being cut to fit the circular form; a block of the first section costs but five cents. The compartments for winding and pumping are shown in Figs. 3 and 4.

(To be Continued.)



Fig. 1.—MAP OF KAIPING COAL FIELD, NORTH CHINA.

Patent-Selling Agencies.

How Inventors are Sometimes Swindled.

The following letter received this week is a sample of those frequently sent to us asking for information concerning some of the numerous patent-selling agencies which send out circulars to inventors:

Messrs. Dewey & Co.—GENTLEMEN: The Blank Patent Co. of your place effected a sale, as they said, of my patent, and wrote me that I must send $22 to pay examination fees. They had taken it at $600 net to me, and I was to be at no expense. When they required this additional amount of me I naturally concluded it was simply a confidence game and they were "working" $22 out of me, especially as the party to whom they were selling wrote me a "hurry-or-you'll-lose-the-trade" letter. Now will you please inform me whether or not these men are reliable? Also is it the regular thing to charge $22 examination fees out of the party selling in advance? G. W.

Felton, Ga., Aug. 17, 1889.

A general answer to this may benefit other inventors who are not familiar with the ways of some of these patent-selling agencies.

When a patent issues, the patentee's or assignee's name is published in the Official Gazette of the United States Patent Office, and he will soon be flooded with circulars from all parts of the country. Some of these are from reliable and honest attorneys, but many are from professional swindlers who make a living by cheating patentees.

An explanation of a few of their methods will aid you in recognizing them when you see them.

One circular professes to come from a firm having a system of patent-selling agencies in all of the principal cities in the United States; that they will undertake to sell your patent for a slight commission if you will send them five or ten dollars to pay for copies of your patent. These copies, they say, are to be sent to their different agencies, and various means adopted to attract the attention of those in the line of business to which your invention relates, and you will soon be the possessor of hundreds or thousands of dollars realized from the sales which they will make. If you send the money for the copies of the patent, it is the last you will hear from it.

Another party will send you a circular intimating that he has had an inquiry made in regard to your patent, and that if you send him a power of attorney he will endeavor to make a sale for you. If you send him a power of attorney, he will write back that he cannot dispose of the patent, but can get $5000 or $10,000 for your Canadian patent (he has first examined and found that you have no Canadian patent), but "if you have no such patent, will hold offer till you get one, if you do so at once. Ten per cent for selling; total cost of Canadian patent through me is $20; this includes Government fee $20, and my fee $20; but in view of the sale will wait for my fee ($20) until patent is sold. Upon receipt of Government fee, I will prepare documents and send them to you to sign. If you cannot accept, say so, and do not ask me to advance the fee, as I am not permitted to do so as solicitor." Of course, if a second thought is bestowed upon this letter, the swindle becomes very apparent. The language itself is obscure, and the last sentence shows the true character of the individual from whom it comes. Accompanying this letter is a certificate from an alleged notary, certifying to the character of the anxious solicitor. Any one sending him money to pay for such a fee cannot expect to receive anything in return, and must not feel disappointed when weeks and months elapse and nothing is heard from their Canadian patent.

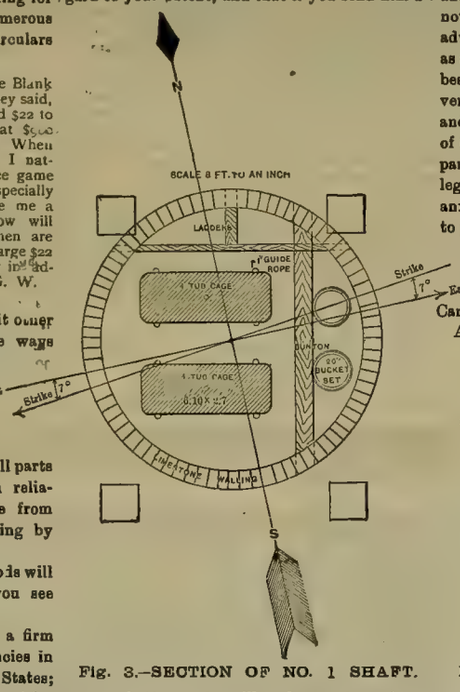


Fig. 3.—SECTION OF NO. 1 SHAFT.

Another swindling institution which has paid particular attention to patentees on the Pacific Coast, adopts the following modus operandi: First, you receive a well-worded circular letter, saying they believe your invention is valuable, and after going to some length in telling its value, they inform you that they are in the patent-selling business and would like to take hold of your patent. It will be necessary to send them but a small amount—usually $4.50 or an equally odd sum—to buy copies of your patent and pay for some other little matters. When they get the money from you they send to Washington and get *one* copy of your patent, print a small advertisement on it, and send it to you saying that it is a *sample* of what they are sending out. In a short time they write you again and say that one of their branch houses has been successful and can dispose of your patent for a piece of property in a distant city; but they also call upon you for $22 or so to pay the expenses incurred by the branch house. As a man is led to believe that he is soon to come into possession of land worth many thousands, it is presumed that he would not delay to give $22 or a like amount in advance of the realization of his bright prospects. If he sends it he does not get any return but a little disappointment, and although "sadder," he is a much "wiser man."

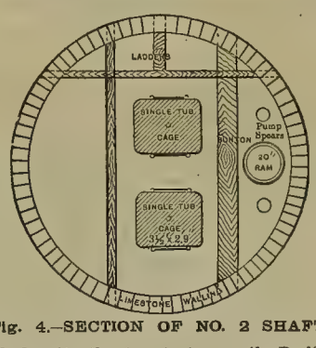


Fig. 4.—SECTION OF NO. 2 SHAFT.

The so-called patent sellers rarely effect a bona-fide sale. They depend upon the advance fees obtained as above for a livelihood. Some of them have thus grown rich and prosperous.

One of the latest tricks is the following: The patentee receives a letter from A & B asking for how much he will sell his patent for such and such a State. He replies, giving a price, say $5000. The patentee soon after receives a letter from X Y Z saying that A & B write they "have corresponded with you, and now say they have decided to purchase the patent on the terms named, provided the title and claims are found to be correct. To ascertain this, they require that X Y Z shall examine and report upon the patent, otherwise A & B will not purchase; that if the patentee wishes to complete the sale he must remit $22 to pay for the examination, which is a work independent of the sale and must be independently paid." The inventor sends the money; a report is made adverse to the patentee; no purchase is made; none was ever intended. Of course X Y Z and A & B were in reality the same people.

There are many other schemes adopted to secure money from patentees, but they are all of the same general character.

The United States Patent Office publishes an Official Gazette every week which gives the name and address of each patentee. These parties who derive their income from the ways here shown take this Official Gazette and send circulars to each person who has taken out a patent, and it is easy to believe that they have quite a comfortable income if only a small proportion of the patentees send money. Those who have been duped out of small sums hesitate to make the matter public.

These unscrupulous persons have no intention of returning an equivalent

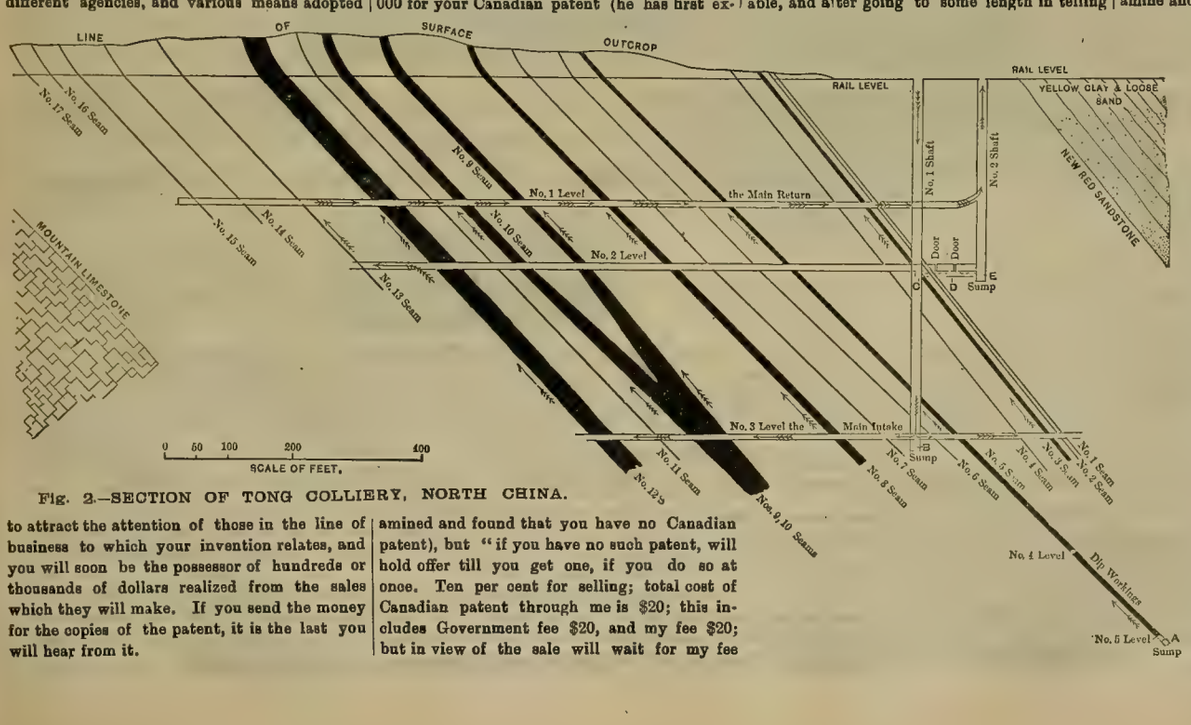


Fig. 2.—SECTION OF TONG COLLIERY, NORTH CHINA.

for the money they receive. The best way for a patentee to do is to make his invention as widely known as possible by advertising or by correspondence with manufacturers who are in that particular line of business. If they do employ patent-selling agencies, only those thoroughly well recommended should be dealt with. It should be remembered, moreover, that bona fide patent agencies, of first-class character, do not also engage in the business of selling patents. The two classes of business are entirely distinct and separate.

Assaying Notes.

[NUMBER 3.]

Testing Lead Ores by Crucible.

The ores of lead can be assayed for percentage of metal more promptly than those of gold and silver; but great care must be taken to understand the constitution of the mineral, if accuracy is essential; unless the deficiency of knowledge for exact fluxation is rendered unnecessary by relying on the universal action of and chemical changes produced by fire during a preliminary roasting at a low red heat when stirred for some 20 minutes.

All lead ores that are valuable to the miner as such when thus roasted, as well as those several unroasted ores of carbonate, chromate, phosphate, and oxide of lead, may be fluxed in the following manner, according to the late J. S. Phillips in his "Explorers, Miners and Metallurgists' Companion":

A. Average your sample with great care; take 25 grains of ore, which project, by a long-handled scoop, into your red-hot crucible; then, after quickly covering this with 100 grains of carbonate of soda, close the furnace for from 15 to 20 minutes, when you may remove the crucible from the fire, tap it lightly to precipitate and unite the molten globules of lead, and when the crucible becomes quite cold it may be broken, and after the bottom has been brushed clean and weighed, the ore's percentage may be known by multiplying this weight by four (or 100 grains may be taken).

This will extract as much lead (when properly conducted) from all classes of ores as any other mode, and even when sulphuret of antimony is also present the latter will not be reduced by these fluxes, but will volatilize and combine to form slag.

For ordinary purposes, even the worst ore, that of sulphuret of lead (galena) and antimony, need not be roasted.

The sulphuret of antimony is often associated with that of lead in the Pacific States and Territories, and when it is present this mode will be found all-sufficient.

When antimony is present an iron crucible must not be used, as it also reduces the sulphuret of antimony to metal.

B. Should it be required to ascertain, also, the percentage of antimony, the same quantity of ore may be treated as above for lead; but for both lead and antimony: to this end the 25 grains of ore must be fused with an intimate mixture of 75 grains of carbonate of soda and 75 grains of cyanide of potassium, which will reduce both metals; and this weight, multiplied by 4, will give the percentage of alloy, while the former percentage of lead being deducted therefrom, the difference will give the weight of antimony.

The purity of lead is best ascertained by flattening the button to a very thin disk, so that its edge may be characterized by absence of cracks, and for its ductility and tenacity, while the middle may be still bent repeatedly without fracture.

The above modes are universal and reliable for all the ores of lead which are of any value to the miner.

There are several other methods practiced in different districts for assaying pure galena, but they require much discretion, where there is any chance for associations of antimony, etc., or errors will be the result.

This carefully averaged sample of 25 grains may be smelted either in muffle or open fire, but if more is taken the larger crucible will require an open fire.

It will be advisable to assay in duplicate, when exactitude is required, and to withdraw at the separate periods of 15 and 20 minutes, so that the larger of the two buttons may be accredited for value.

If copper is present in the ore, a more moderate heat and less time may be advantageously given, so that as little copper as possible may be reduced therewith.

Copper may be also dissolved out from the weighed sample by a little dilute sulphuric acid, then watered, poured off and dried over lamp, sand-bath or other convenience, before fusion.

FORCE OF RUNNING WATER.—In the Conemaugh river stood a bowlder of granite eight feet in diameter and five feet high. The flood split it in two, carrying parts of it a distance down the stream. The writer has seen a bowlder fully four times the size of the one above referred to moved quite a distance by the waters of Deer creek, just below Nevada.

COTTON AND WOOL.

The Wool Trade of Persia and Transcaucasia.

The following observations on the wool trade in Persia and the adjacent regions are from a report recently issued by the British Foreign Office. The trade is almost entirely in the hands of Armenians, who purchase for their own people in Baku and Tiflis, and occasionally send the wool direct to the agents in Marseilles. Agents of Polish manufacturers are, however, beginning to compete successfully with the Armenians. There is nothing to support the idea which is prevalent that the Central Asian railway is drawing all the Khorassan and Central Asian wools to Russia and denuding the English market. The railway has undoubtedly lowered the prices of Bokharan and Turkestan wools on the Caspian, and the Baku-Tiflis line has cheapened all Asiatic wools in the Black sea ports, but neither railway gives Russia an exclusive advantage. As regards Khorassan wool, the sheep are chiefly the property of the nomad tribes. There are two clips a year, and March and August are the buying months. Sabzewar is the center of the trade, and the permanent residence of the Armenians engaged in it. These make cash advances to the Persians, who visit all the villages at the shearing season and purchase the wool, which is then brought to Sabzewar, the Persians being allowed a commission of two per cent. At Sabzewar it is sorted and baled, and then forwarded, via Shahrud, to Bender-i-Gez for shipment across the Caspian. The bales weigh about 190 pounds each, and two form a camel-load. The actual price paid in October last in Sabzewar was about four pence per pound, and the quantity annually exported is about 14,000 or 15,000 bales. As to the possibility of securing Khorassan and Transcaucasian wools for the English markets, Mr. Law observes that they are both to be bought freely in Baku and Tiflis.

It is purely a question of price and of knowledge of the market, which is not gained without time and trouble. Probably Armenians or Parsees would have to be employed to make the first purchases from the producers. Mr. Law also points out that Khorassan wool might be transported southward and shipped from Bender Abbas, instead of from the Caspian. It can be delivered at Batoum for about six pence per cwt. less than at Bender Abbas, but there is no direct communication between Batoum and Great Britain, and British trade suffers severely in many ways from the want of it.

The Wool Industries.

Colonel Harney, President of the Manufacturers' Association, lately made a statement before the Senate Committee which seems a little contradictory. He says that some of the wools produced in Mendocino county are almost as fine as those produced in Australia, and that if the grade and breed could be maintained it would be possible eventually to rival Australia. But Colonel Harney added that it would most certainly benefit the people of the State and of the country generally if the higher grades were admitted free of duty.

Commenting on the above, a contemporary says: This is equivalent to saying that the production of the higher grades ought not to be encouraged in this State or elsewhere in this country. Certainly if the lower grades are required to pay a duty, as Harney advises, the admission of the higher grade free would tend to center production upon the lower grades. It is quite possible that it may be for the present interest of wool manufacturers to open our ports to free wool of the higher grade. As we do not at present produce the very finest grades, the duties paid on such grades add to the cost of the manufactured product. If it were an established fact that we could not produce the higher grades we might then admit them free of tax, on the principle that we now admit tea and coffee free. But Colonel Harney has testified to the superior quality of Mendocino wool and to the prospects that wool may be produced in that county equal to the best of Australian wool. Probably Mendocino county is not the only location in the State in which similar results may be attained. The question, then, is, should the production of the highest grades of wool be abandoned for the immediate benefit of wool manufacturers?

THE ONCE DESPISED COTTON SEED.—Was there ever, says the *Banker's Monthly*, such a history as that of the cotton seed? For 70 years despised as a nuisance and burned and dumped as garbage, then discovered to be the very food for which the soil was hungering, and reluctantly admitted to the rank of utilities, shortly afterward found to be nutritious food for beasts as well as for soil, and thereupon treated with something like respect. Once admitted to the circle of farm industries, it was found to hold 35 gallons of pure oil to the ton, worth in its crude state $14 to the ton, or $40,000,000 for the whole crop of seed. But then a system was devised for refining the oil up to a value of $1 a gallon, and the frugal Italians placed a cask of it at the root of every olive tree and then defied the Borean breath of the Alps. And then experience showed that the ton of cotton seed was a better fertilizer and a better stock food when robbed of its 35 gallons of oil than before, that the hulls of the seeds made the best of fuel for feeding the oil-mill engine, that the ashes of the hulls scooped from the engine's draught had the highest commercial value as potash, and that the "refuse" of the whole made the best and purest soap stock, to carry to the toilet the perfumes of Lubin or Colgate. In regard to the cotton-seed hulls, a still further important discovery has been made. An experimental paper-stock mill at St. Louis has demonstrated that the waste or refuse lint of mills that make cotton-seed oil is almost as valuable as the oil itself, this substance being convertible into paper. The receipts of the cotton-seed oil-mills, it is said, will be almost doubled from that source, while expenses will not be greatly increased.

COTTON MANUFACTURING AT THE SOUTH is compelling New England cotton manufacturers to go on to finer grades of goods, leaving the coarser grades to the mills of the South. Longer stapled cotton, largely of Egyptian growth, is coming more and more into demand, for which the combing machine is required. Not only this, but the fancy loom for gauze and other descriptions of weaving is meeting with an unusual demand; and where the witch motion can be applied it finds a ready reception in many of our best equipped and most progressive mills. Elegant cotton fabrics are being made in some of our New England mills, which are not infrequently placed upon the counter and sold in favorable competition with like goods of foreign manufacture. There is no good reason why our mills should not take up with the manufacture of finer fabrics, and pursue still more extensively the work already begun.

GAIN IN NEW ENGLAND SPINDLES.—The known and estimated gain in spindles in the New England States from Jan. 1, 1888, to June 30, 1890, in round numbers is 1,500,000; with a total spindle capacity of 10,500,000, the net gain for New England, including Massachusetts, should be a trifle over 14 per cent. For Massachusetts alone, 13½ per cent; for Middle States, 9 per cent; for Southern States, 60 per cent; for Western States and Territories, 13½ per cent; British America, 3 per cent.

WOOLEN-MILLS IN UTAH.—The new Deseret Woolen-Mills at Salt Lake City are ready to begin business. The manager says he expects to turn out 20,000 yards of cloth a month. The woolen-mills at Provo, Utah, have been enlarged to twice their former capacity. They will now be run every day in the year.

MEMPHIS is the greatest inland cotton market in the world, receiving from 700,000 to 1,000,000 bales yearly.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, term of subscription, and give it their own patronage, and as far as practicable aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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JULES BAUMANN—Arizona.
FRANK S. CHAPIN—Nevada.
CHAS. F. BLACKBURN—Idaho.
L. H. WILSON—Oregon.

LOCOMOTIVE WORK.—The Baldwins at Philadelphia have lately entered into contract with the Northern Pacific for 76 locomotives. This will give them about six weeks full work. This company is watching its opportunity to supply some of the new roads in South America with engines.

Books on Working Ores.

BY GUIDO KUSTEL, M. E.

ROASTING OF GOLD AND SILVER ORES (Second Edition) and the Extraction of their Respective Metals without Quicksilver. By GUIDO KUSTEL, M. E. 1880.

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Assessment Notices.

ASSESSMENT NOTICE.

California & Nevada Railroad Company.—Location of principal place of business, San Francisco, California. Location of Railroad, Alameda County, California.

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 3d day of August, 1889, an assessment, No 1, of Fifty Cents per share was levied upon the Capital Stock of the corporation, payable immediately in United States Gold Coin to the Secretary at the office of the Company, Room 12, No. 320 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 20th day of September, 1889, will be delinquent and advertised of sale at public auction, and unless payment is made before, will be sold on Monday, October 14th, 1889, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

E. A. PHELPS, Secretary.

Office, Room 12, No. 320 California Street, San Francisco, California.

ASSESSMENT NOTICE.

Gray Eagle Mining Company.—Location of Principal place of Business, San Francisco, California. Location of Works, Placer County, California

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 13th day of August, 1889, an assessment, No 14, of Four Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin, to the secretary, at the office of the Company, 327 Pine Street, Room 9, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 16th day of September, 1889, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 8th day of October, 1889, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

O. H. BOGART, Secretary.

Office, 327 Pine Street, Room 9, San Francisco Cal.

GOVER MINING COMPANY.

Notice of Special Meeting of Stockholders.

A Special Meeting of the Stockholders of the Gover Mining Company will be held at the office of the Company, Nos. 13 and 15 Fremont Street, San Francisco, California, on TUESDAY, THE TENTH DAY OF SEPTEMBER, 1889, at 1 o'clock P. M of that day, for the purpose of electing five Directors, to serve until the next annual meeting and until their successors are elected and qualified, and for the transaction of all other business that may be brought before said meeting.

By order of the Board of Directors.

GRAY DEW, Secretary.

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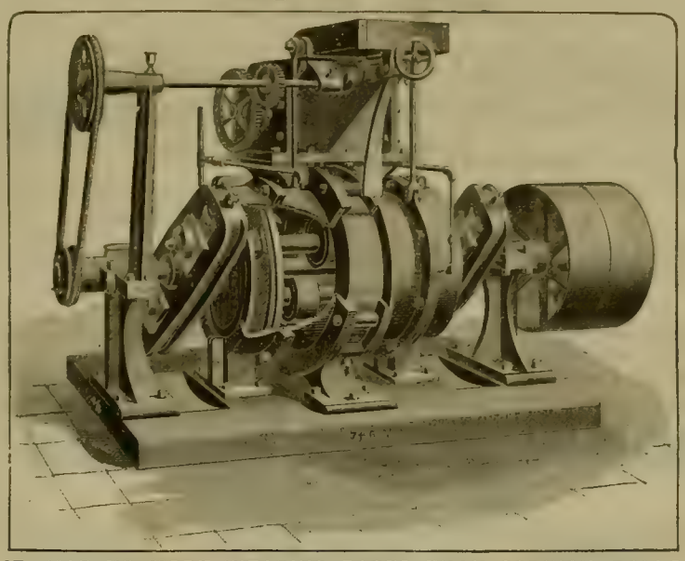
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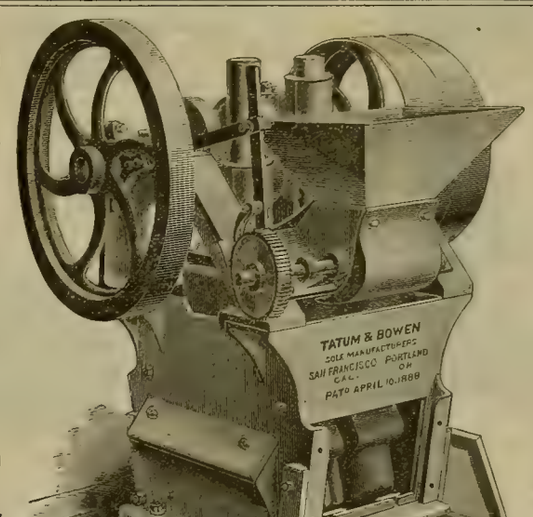
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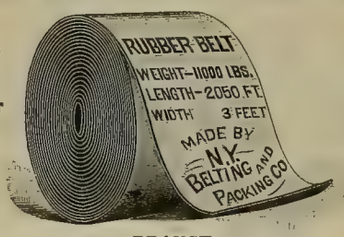
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THE CALIFORNIA CONSOLIDATED Gold Mining Company, Sierra City, Cal., A. Schubert, President; Alvin Fischer, Secretary; A. Leffer, Superintendent. Divided into 300,000 shares at $1 each. Property comprises two locations. Ore assays $7 per ton, average. Coarse gold, solid rock; vein from 15 inches to 2 feet wide Tunnel No. 1 in 120 feet, and prospects well. No. 2 just begun. Stockholders: Alvin Fischer, A. Schubert, Gus Fischer, F. L. Fischer, Anton Fischer, Fred Fischer. For information concerning stock, etc., apply to F. L. Fischer, Sierra City.

THE BUFFALO CONSOLIDATED GOLD Mining Company, Sierra City, Cal., Ernest Busch, Superintendent. Stock divided into 800,000 shares at $1 per share. The property comprises 5 locations. Ore finely decomposed, carries coarse gold. Size of ledge: Tunnel No 1, 32 ft.; No. 2, 9½ ft.; No. 3, 10 ft. Fine black decomposed rock interspersed with white quartz. New 10-stamp mill run by a Pelton Wheel, blacksmith shop and boarding house. Stockholders: Ernest Busch, Hugh Murray, Frank Cook, J. G. Lee, Henry Carpenter. For further information apply to Ernest Busch, Sup't, or Hugh Murray, Sec'y.

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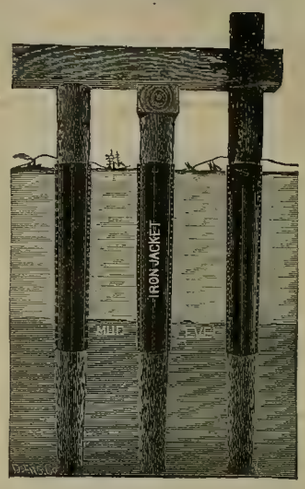

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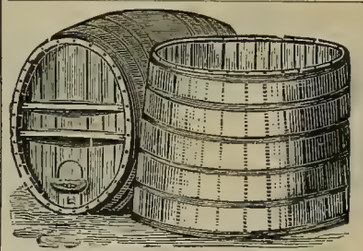
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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

From the official report of U. S. Patents in Dewey & Co.'s Patent Office Library, 220 Market St., S. F.

FOR WEEK ENDING AUG. 20, 1889.

409,446.—SINKING WELLS—H. W. Blaisdell, Yuma, A. T.

409,346.—TWO-WHEELED VEHICLE—K. A. Brigham, Gilroy, Cal.

409,271.—REMOVABLE SAWTOOTH—P. Cardiff, Astoria, Or.

409,352.—HORSE BLANKET—John E. Foster, Ferndale, Cal.

409,189.—WATER ALARM FOR STEAM BOILERS—A. W. Gilfillan, Mendocino, Cal.

409,655.—TYPE-WRITING MACHINE—F. E. Gladwin, S. F.

409,403.—FLOOR JACK—W. W. Irwin, Silver Lake, Or.

409,589.—ORE CONCENTRATOR—C. F. Jacobson, S. F.

409,405.—MOLDING PLANE—E. D. Johnson, Flagstaff, A. T.

409,302.—VEHICLE AXLE—J. G. Kenyon, Port Kenyon, Cal.

409,303.—POSTING GUIDE FOR BOOK-KEEPERS—H. H. Love, Sacramento, Cal.

409,476.—WRENCH AND OIL-CAN—J. H. Loso, Los Angeles, Cal.

409,493.—PAVING COMPOUND—Patterson & Groat, S. F.

409,335.—BALING PRESS—Jacob Price, San Leandro, Cal.

409,423.—FIREMAN'S MASK—T. E. Richet, Portland, Or.

409,536.—BRAKE FOR RAILWAYS—A. Watson, S. F.

409,342.—MACHINE FOR CUTTING OFF PILES—E. J. Weston, S. F.

409,541.—SMELTING FURNACE—J. J. Williams, S. F.

The following brief list by telegraph, for Aug. 28, will appear more complete on receipt of mail advices:

California—G. H. Bohrs, San Francisco, pilot or wheel guard for street cars; Howard W. Brown, Oakland, copying sheet; Lewis M. Clement, Oakland, and G. C. Watriss, San Francisco, cable or electric street railway; John Friss, near French Camp, bag-holder; John E. Furry, Stockton, fire-ladder; Albert J. Hart, San Francisco, thread-controlled stop-mechanism for sewing machine; William Kidd, Fishermans Bay, ox yoke; Herman Kohn, San Francisco, double-acting bellows; Thomas H. Melrose, San Francisco, speed-controlling device for elevators; Charles H. Ohm, San Francisco, safety guard for cars; Lester A. Pelton, Nevada City (assignee to A. P. Brayton Jr., San Francisco), water wheel; Charles B. Towle, Vallejo, school desk; George H. Wright, San Francisco, device for repressing cables at street crossings of cable roads.

NOTE.—Copies of U. S and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

BALING PRESS.—Jacob Price, San Leandro. No. 409 335. Dated Aug. 20, 1889. This patent covers certain details in construction in the horizontal baling presses made by Mr. Price.

HORSE BLANKET.—John E. Foster, Ferndale, Humboldt Co. No. 409,352. Dated Aug. 20, 1889. The invention consists in novel straps, belts and bands for keeping the blanket in place. The object is to provide a simple and effective device for holding the blanket on the horse and dispensing with the surcingle commonly employed for this purpose.

TWO WHEELED VEHICLE.—Kasson A. Brigham, Gilroy. No. 409,346. Dated Aug. 20, 1889. The general object of this invention is to overcome the unpleasant horse motion which is a feature of this class of vehicles. The particular object is to provide a strong and effective shaft connection by which the desired result is obtained.

VEHICLE AXLE.—J. G. Kenyon, Port Kenyon, Humboldt Co. No. 409,362. Dated Aug. 20, 1889. This invention relates to that class of vehicles in which the wheels are attached to and rotate with independent axles. The invention consists in the novel means for attaching the wheel to the axle, the novel bearings for the opposing axles, the casing or box in which they are confined and details of construction. The object is to provide a suitable and practical construction in which each wheel, though secured to and rotating with its axle, shall have sufficient play to avoid great rigidity, and also to provide a simple and effective support for the independent axles from hub to hub.

POSTING OR COPYING GUIDE FOR BOOK-KEEPERS.—Harry H. Love, Sacramento. No. 409,363. Dated Aug. 20, 1889. This posting or copying guide consists of parallel opaque strips with transverse uniting bars and set-screws whereby the space between the strips may be regulated, and sliding guides upon the ends of the strips for holding them in proper relative position upon the book from which the copying is to be done. In posting from the journal or cash-book to the ledger, book-keepers experience some difficulty in preventing mistakes—such as reading the name from one portion of the line and the wrong amount in the column of figures—and in copying lists of names and in other similar work such mistakes are apt to be made by missing names or mistaking lines. This device is intended to prevent these errors.

Mining Personals.

J. R. Tregloan is superintendent of the South Spring Hill mine, Amador county.

A. P. Minear, manager of the Amador Con. M. Co, has been in the city this week.

W. Dodge is superintendent of the Baker Divide mine at Forest Hill, Placer county.

Robert Stevenson of Sierra county has bonded the Gardner or Paugh mine, near Clinton, Amador county.

Mr. Craig, a mining expert of Colorado, is at Silver City, Idaho, examining the Black Jack and Empire State mines.

Superintendent Comstock of the Silver King mine informed the Florence (A. T.) *Enterprise* that work in the mine has progressed satisfactorily.

Mr. Hopper, formerly at the Sierra Buttes mine, Sierra county, is now secretary of the Uncle Sam mine, Shasta county, belonging to the same company.

John Prout, who was for years shift boss of the Gould & Curry mine, on the Comstock, died at Freeland, Montana, last week. He was foreman of the Freeland mine.

W. H. Radford, the superintendent in charge at the North Bloomfield mine, has paid the $500 fine which was levied by Judge Keyser last March for illegal mining.

A. L. Walker, superintendent of the Old Dominion Copper Co., Globe, Arizona, is an amateur photographer, and has been making some good underground "flash-light" pictures.

Mr. Leak, who is connected with the Montpelier quartz mine, just above Downieville, Sierra county, has returned to his home in Chicago. Mr. J. Hughes has charge of the mine.

E. A. Shear has returned to Salt Lake from Pioche, where he went in company with Jos. S. Cook to repair and put in working order the shaft and pump in the old Raymond & Ely hoisting works.

D. D. Bailey, one of the pioneers of 1869, at Julian, San Diego county, has been elected recorder of Banner district, San Felipe canyon, a few miles from Julian. He is one of the owners of the Ready Relief mine.

Mr. L. Gross collected and arranged the fine exhibit of minerals and ores at the fair at Redding. The prize for the best class of ore on exhibition was given to the Gladstone M. Co., on Kline Gulch, in the French Gulch district, Shasta county.

James Sallee of the Iron Mountain (Shasta Co.) mine was in town this week to get a crank-pin for his engine, having broken one but without harm to the engine. He reports the mine very successful and their new roasting furnaces working to perfection.

A. H. Butler has returned to San Diego from Alamo, Lower California, with the papers in his pocket showing that six of the best mining claims at Alamo now belong to his company. These, he said to a reporter, were sifted out of the 22 original denouncements made.

D. B. Lyman, superintendent of the North End mines, has agreed to close the mines on Saturday, Sept. 7th, the day of the Miners' Union picnic. It will be a regular miners' holiday, as nearly all the men intend to go to Carson. It is likely that most of the other Comstock mines will also be closed on that day.

August Werner is superintending the building of the new smelter at Pioche. Mr. Werner of late years has taken out a number of letters patent on inventions made by him, several of which apply to smelters. The ball-valve tuyere nozzles and improved slag-pots to be used at the furnace at Pioche are patented by him.

The Phillipsburg (M. T.) *Mail* says Robert Beveridge, formerly foreman of the Hope mill, and J. J. Hayden departed yesterday morning for South America, where they will engage in mining. Their families also left during the week for Salt Lake and Butte, respectively, where they will remain until the gentlemen have arranged homes in that tropical country.

Mr. A. B. Paul, the well-known pioneer mining man of this State, is on a visit to the city, having come down from the Calumet mine, six miles above Redding, Shasta county. This company has a 24-stamp mill and is working 25 men, though more will be employed when there is more water at command. They have a five-ton mill for working gold-bearing ore by dry amalgamation. Mr. Paul says they have been very successful with the dry process and he will shortly give us an account of the results of the various tests. Paul pulverizing barrels are used and a very high percentage is obtained.

Capt. C. B. Dahlgren, who conducted mining operations in Battle Mountain and Pittsburg districts, Nev., for several years, is now engaged in mining on the Colorado river south of the Nevada line, and about 40 miles from The Needles, on the Atlantic & Pacific railroad. He has an immense lead, which averages about $14 per ton in gold, and works which reduce about 30 tons per day. The mill is situated on the Colorado river, and though the temperature seldom goes below 90°, the men have good health and there is very little sickness. He says it is not unusual to see a man prepare to go to sleep by dipping his blankets in the river, then spreading them on a bunk or mattress and lying down on them.

Coast Industrial Notes.

THERE are eight sawmills at Grays Harbor, Washington, that cut daily 490,000 feet of lumber.

AN important discovery of natural illuminating gas has been made on the farm of Captain Boyes near Sonoma.

SAYS the Reno *Gazette:* A log raft containing 750,000 feet of lumber was recently towed from Bijou, Lake Tahoe, to Glenbrook.

TULARE county redwood lumber is coming into demand at many points in the State, and lately several large orders for it have been received.

THE Union Pressed Brick and Terra-Cotta Works of Vallejo has already spent $30,000 on the works, and it will require a large sum yet to complete them.

THE salmon pack of the Columbia and Sacramento rivers has fallen off from somewhere in the neighborhood of 900,000 cases to but little more than 200,000 a year.

DUGAN & BLAIR have recently put a heavy set of rolls in their flouring-mill at Bishop Creek, Inyo county, rebuilt the wheel and overhauled the machinery generally.

THE citizens of St. Helena raised by cash subscriptions $2000 and presented it to Duckworth & Genung, whose machine-shops were recently destroyed by fire. The firm will rebuild and resume business.

THE story of the discovery of codfish banks off the coast of San Diego by the Albatross is discredited by experts. The cod banks near Cape Lookout, on the upper coast, are expected to prove very valuable.

THE Homer *Mining Index* has this industrial note: "Louis de Chambeau is making off-hand sketches with a long-handled shovel at the May Lundy dump, while several others are upholstering ore-sacks."

E. C. VOORHIES, president of the Amador County Committee, regarding the display of golden Amador's mineral and productive wealth at the State Fair, reports that a space 50x50 has been allowed in the Pavilion.

SINCE the Seattle fire 6000 tons of sandstone have arrived at that city from the four quarries at Chuchanut, on Bellingham bay, which are running at their full capacity, and granite is arriving by rail from Spokane Falls.

STEAM road-wagons have been put on the road to haul lumber from Sierra valley to Verdi. They weigh 20 tons each, and haul a load of 50,000 feet of lumber each trip. The distance is 16½ miles, the grade 500 feet to the mile, and a round trip is made in 12 hours.

THE Navy Department has readvertised for bids for the 2000-ton cruisers for which there were no successful bids when opened this week. The advertisement reduces the required speed to 17 knots per hour instead of 18, and adds six months to the length of time for their construction.

WITH 500 square miles of salt fields of unknown depth, and a whole mountain range of the purest rock-salt, says the Virginia City *Enterprise*, Nevada should be able to stand off the salt trust when it begins to cinch. Our State authorities should now offer a premium for the discovery of a sugar mine.

WORK at the Sonora foundry, Messrs. Romans & Cowie, has been quite active and orders for mining and other kinds of machinery have kept the foundry very busy. All the iron-work for the sulphuret works now building has been done at this foundry. An order has been given for ten additional stamps for the Mattison mill in Calaveras county.

F. C. MCNEIL tells the Reese River *Reveille* that the Chinamen are doing very well in their placer mining below Ione (Nev.) in the canyon, and that they are running a tunnel at present above the diggings to get more water. All the resident miners are greatly surprised over the success of the washing, and have wished many times since that they had dropped on to it.

G. N. FOLSOM has moved his camp from Incline, Lake Tahoe, to the Burk ranch, just over the mountain west of Genoa, Nev. It is the intention to cut 50,000,000 feet of logs, which will be towed to the Incline mills, and when sawed the lumber will be flumed down into Washoe valley. It will take several years to cut off the timber in the vicinity of the new camp.

DURING the past quarter of a century we have had little use for Eastern-made blinds, doors, or sash, for local factories have fully supplied the market, and there has been a surplus for export. The assessor reports 13 factories for the manufacture of these goods in this city. Nearly all of them are south of Market and east of Fifth streets. These factories employ 1400 to 1500 men and boys and cut up over 10,000,000 feet of lumber annually. The value of the manufactured product is estimated at $5,400,000 per annum. These are not the only factories of the kind in the State. There are others in the midst of the lumber districts in the interior. Some of these manufacture on a large scale.

THE Inyo *Register* says: The Big Pine sawmill is temporarily closed down. Wildasinn's mill, at Mineral Park, is running constantly and will cut nearly half a million feet of lumber before closing down. The Black Rock mill is also running, but will probably hang up soon. The Rock Creek mill has not fired up at all yet this season, but will make a short run this fall, probably.

JESSE SUTTON, superintendent of the transportation department of the Shasta Lumber Company, informs the Redding *Free Press* that the company is receiving 35,000 feet of lumber per day at its yard in Redding. Six 6 horse and two 8-horse teams are employed in hauling the timber from the dump to town. The company has 55 wagons, representing an investment alone of $10,000 or $12,000.

THE copper mine at San Pedro, N.M., has closed down and over 200 miners are thrown out of employment. The smelter, however, will continue to run. This action of the company is regarded by some as a blow at the camp on account of the recent rich strikes there, while others claim that the mine will pass into the hands of contractors and that in order to arrange the details a close-down was ordered.

FOR several weeks past large quantities of redwood railroad ties have been shipped east by the Southern Pacific Company for the Rio Grande Western. The ties are brought down from Mendocino county to Long wharf, and from there shipped in box cars to Ogden. The ties are for the Rio Grande Western—the newly incorporated Denver & Rio Grande Western, which line extends from Pueblo to Salt Lake City.

GREAT activity at present prevails among the lumbermen up in the Sierras. The mills are being run both day and night, and millions of feet of lumber are being piled up. The wood-cutters are also busy, and what escapes the sawmills goes into the woodpile. Lumbering will now be rushed day and night until the snows of winter begin to pile up in the mountains. Fires and the woodman's ax are fast denuding the "big ridge."

A LOCAL woolen-mill has completed a contract for 8000 blankets for the use of the inmates of the Soldiers' Home, near Dayton, O. This contract was let last April after a careful scrutiny of samples by the army officials, who met at Hartford, Conn., for the purpose of opening bids in accordance with advertisements. The bid of the local mills was four cents lower than the next lowest bid, and the contract was therefore awarded to the local works.

THE Inyo *Register* says that the Mono mills have temporarily suspended operations, though the Bodie & Benton R. R. still runs out lumber and wood trains from Bodie. The logging is now done by George Kinney of Round Valley. The mills manage to utilize pretty much all there is in the tree, as what is not available for lumber is cut into wood and used by the locomotives doing the logging or shipped into Bodie for use by the mills and hoisting works.

THE Victoria *Colonist* has printed a statement of the salmon pack of British Columbia to Aug. 17th, totaling 376,000 cases, being 127,000 cases above the largest pack of any previous year. Of this amount the northern canneries contribute 100,000 cases, the remainder being from Frazer river. It is estimated that the year's pack will reach 420,000 cases. This has all been sold at from $5.50 to $6.50, and calculating at $6 a case, makes the total value over $2,500,000. The Frazer river canneries have from 10,000 to 30,000 cans each.

THE planing-mill of John Rowell & Co. is nearly completed, and will supply the wants of Oroville and vicinity. The mill is 180 feet along the railroad track near the depot, by 100 feet back; 20 acres consists of lumber-yard. The mill is raised several feet from the ground, and its main shafting is underneath. The driving-power consists of an Atlas engine of 75-horse power, which is bolted down to a concrete foundation, and is even with the upper floor of the mill, while the two 12-foot boilers are 6 feet lower.

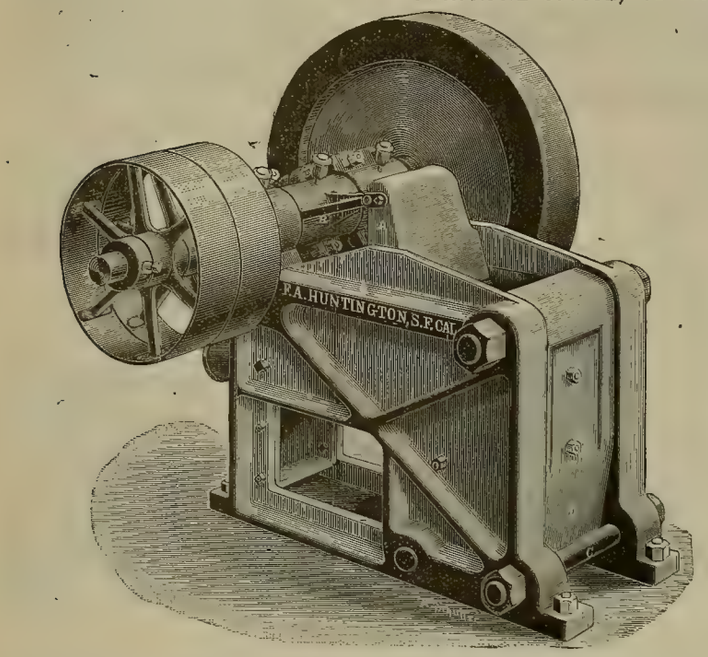
THE Virginia *Enterprise* gives a quaint account of a man who combines the occupation of millman and chiffonier at a place near the C. & C. dump: "There are 30 tons of rags, bottles, bones, pots, old iron and other metal nestled within the precincts of the stronghold—the accumulation of years. There is nothing that the Chinese or East Indian chiffoniers can pick up on the streets that Signor Guerrero will not buy. The mill adjoins and is part of the 'castle.' It is driven by an over-shot water-wheel, fed direct from the Taylor-street sewer. It has two 200 pound stamps and one pan, and can crush and amalgamate 500 pounds of ore in 24 hours. The Signor says his tailings are not worth saving, which compliment can hardly be paid to all other mills on the lode. Signor Guerrero built the mill himself, runs it and conducts the junk business besides."

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MANUFACTURER AND DEALER IN

STEAM ENGINES AND MINING MACHINERY OF EVERY DESCRIPTION.

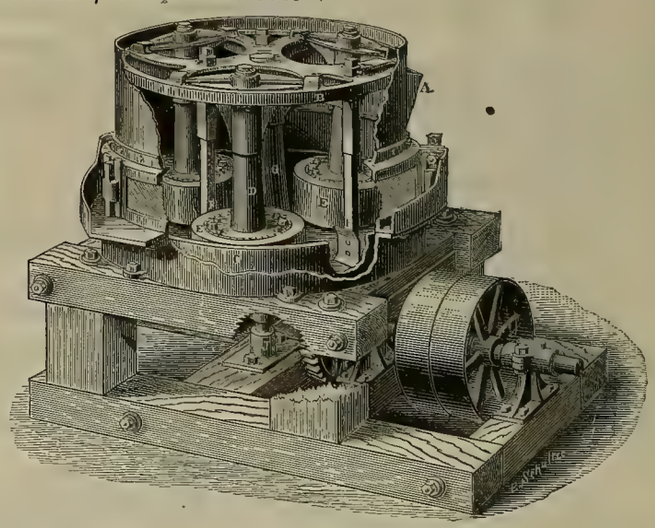
PRINCIPAL OFFICE, 45 FREMONT STREET, SAN FRANCISCO.



Huntington's Improved Rock-Breaker.

The main features of this machine are strength, ease of adjustment and simplicity of construction.

The movable jaw *A* is worked by the eccentric *B* and is pivoted at the bottom. The stationary jaw *D* is secured at the top by a bolt running through it, and at the bottom bears against the heavy bolt *C*. The main wear is, of course, at the bottom of a breaker of this form, and the wear is easily taken up by inserting a plate between the bolt *C* and the jaw *D*. The jaw is thus swung in at the bottom, and the opening where the ore passes through is made correspondingly smaller. As will be seen by the cut, this machine is of very simple construction and is strong and durable.



F. A. HUNTINGTON'S
Centrifugal Roller Quartz Mill.

The following will explain the above cut:

The ore and water being fed into the mill at the hopper *A*, the rotating rollers and scrapers throw the ore against the ring die, where it is crushed to any desired fineness by the centrifugal force of the rollers as they roll over it.

The water and pulverized ore are thrown against and through the screens when fine enough. The discharge is so perfect that it makes little or no slimes, and leaves the pulp in good condition for concentration. The rollers are suspended, leaving a space of one inch between them and the bottom of the mill, thus allowing them to pass freely over the quicksilver and amalgam without grinding it or throwing it from the mill, while it agitates it sufficiently to make amalgamation perfect. For wet crushing and gold saving it has no equal.

I claim especial merit in that feature of this system *which prevents* ALL FLOURING of gold and quicksilver, and the consequent loss of gold that attends stamp milling.

For the economical working of ore that contains sulphurets, I particularly claim the adaptation of this mill. The rotary method of crushing the ore so granulates the pulp (which is discharged the moment it is crushed) that a complete concentration of sulphurets is rendered most easy.

FREEMAN'S
Dry Process
GOLD SEPARATOR.

They are good machines. If the gold is in the dirt they will save it. They will save finer gold than water will.

T. J. SCOTT,
Osceola, Nevada.

Smith & Drew took out Tuesday, in their dry wash diggings, in addition to 5 ozs. of fine gold, a nugget weighing 22 ozs. The machine used was Freeman's Dry Process Separator.—*Utah Daily Union, May 10, 1889.*

☞Send for descriptive Circular and Price List.

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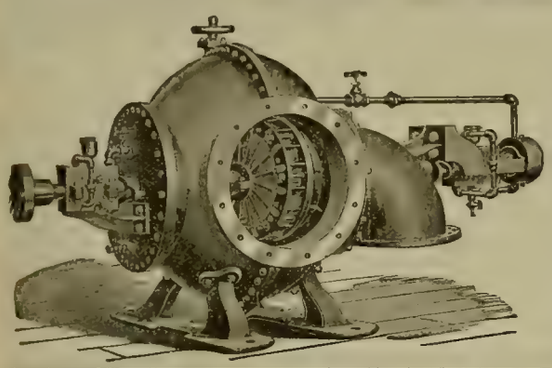
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These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

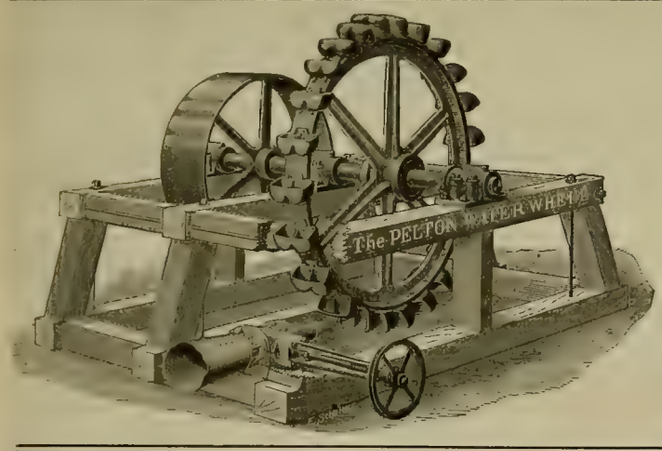
Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

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Over 600 in use on the Pacific Coast alone, aggregating upwards of 50,000 Horse Power.

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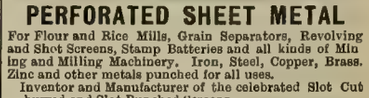
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Market Reports.

Local Markets.

SAN FRANCISCO, Aug. 29, 1889.

General trade the past week was fairly active for the season. Several distant buyers are sampling the market, while the near-by dealers will begin to come in soon. The Mechanics' Fair draws merchants from all parts of the State, who take advantage of it to lay in their stock of goods. The large grain harvest will do no little in relieving any stringency in the interior and restore confidence in the future. Although prices are now low, yet better values are looked for; even if this be not realized in the near future, the increased yield to the acre will do no little in offsetting the low prices. The improved outlook for the dried-fruit crop is a promising feature to prospective prosperity. Manufacturers have a fair business. Machine and iron-workers in general report more orders in hand.

The local money market continues easy, with only a fair inquiry for funds. As yet, farmers' requirements for crop purposes are mostly met by interior banks and capitalists. There is nothing in the market calculated to invite a speculative movement outside of wheat and barley. Those who have risked money in them on the bull side have not coined any too much, consequently they are shy in risking much cash on the long side," although it would seem that at present prices very little risk is run. In local securities, a deal appears to be under way in the powder stock, but whether those who buy at an advance can realize much profit, is, as yet, a problem. Other local securities are too high to invite operators to any great extent. Mining stocks have been quite active, so far as the Comstocks are concerned. An attempt is evidently being made to draw in new victims to bleed, on the old cry, after they are well in the meshes of big ore strikes. That the manipulators will be successful, there cannot be the slightest doubt, if the future is to be judged by the past.

MEXICAN DOLLARS—The market is quiet but firm at 74 to 74¼c from first hands, retailing over the counter at a slight advance. The last steamer leaving for Hongkong took out Mexican dollars valued at $154,304.

SILVER—The market has exhibited considerable strength the past week in sympathy with an improving market abroad. The output on this coast is below requirements, and to meet urgent wants, buyers are at times compelled to pay good prices. The last sale we have reported was at 93 1-10c per ounce fine. The asking rate on yesterday was 93¾c, but so far as obtainable, buyers were not disposed to bid, evidently waiting until toward the last before buying. The European market is reported dull, but very strong, with any buying of moment met by higher asking rates. The last steamer for Hongkong took out bullion valued at $163,000. Silver to-day is quoted by buyers at 93¾c.

QUICKSILVER—Receipts the past week aggregate 179 flasks. Shipments by sea were as follows: To Guaymas, 323 flasks; Ensenada, 25 flasks. The market with us is reported dull. The consumption on this coast is said to be light, but then the output of the mines is also light.

BORAX—Receipts the past week aggregate 614 ctls., and the exports by sea 24,952 lbs. to New York. The market is reported strong at full prices, under a good trade call from the East.

LIME—Receipts the past week aggregate 6379 bbls. The consumptive demand continues free, with a fair shipping inquiry reported.

TIN—Exports by sea the past week were as follows in plate: Victoria, 37,012 lbs.; Guaymas, 19,422 lbs. The spot market for both pig and plate favors buyers, owing to liberal supplies and buyers offish. For prompt shipment the market is very strong, which precludes, for the present, any business. Outward freights at supply ports are reported very strong.

IRON—Imports the past week aggregated 150 tons pig from Irondale. The local market is very strong, with indications of an advance. The consumption is gradually increasing, which naturally is reducing stocks, owing to the small imports. The quantity on the way is said to be light, while the high prices abroad for both pig and freight are against any business for the present. It looks as if prices here must advance soon.

The following are the latest comparative quotations f. o. b. at Glasgow:

F. o. b. Glasgow.	Aug. 14, '89.	Aug. 21, '89.
No. 1 Coltness	59s 6d	60s
" Langloan	58s	58s 6d
" Summerlee	58s	58s 6d
" Gartsherrie	56s 6d	57s
At Ardrossa.		
No. 1 Eglinton	47s 6d	47s 6d
" Glengarnock	54s 6d	55s
" Dalmellington	49s 6d	49s 6d

COAL—Imports the past week aggregate as follows: Nanaimo, 3300 tons; Coos Bay, 475; Seattle, 3577; Port Townsend, 700: Australia, 2172; Departure Bay, 4300. Total, 14,524 tons. The market for both spot and to arrive is very strong. At the close $7.50 is asked for Australian for prompt shipment. Outward charters in Australian ports are advancing. As high as 16s is reported to have been paid the past week. Coast coals have a stronger tone with an advance not at all unlikely at an early day. The demand from consumers is reported to be increasing. The tonnage on the way from and on berth at Newcastle, N. S. W., and at Sydney for this port aggregates about 70,000 tons register.

COPPER—The local market is strong in sympathy with Eastern and European advices. It is very generally believed among usually well-informed parties that the output of the mines is to be reduced under a new arrangement between all parties in interest; yet, while claiming this so as to reduce the stocks more rapidly, they think that prices will not be advanced much, at least not enough to interfere with the consumption.

THE manufacturers of window glass, table glass and crockery have formed a trust.

Eastern Metal Markets.

By Telegraph.

NEW YORK, Aug. 29, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	42 5-16	92½	$12 10	$3 90	$.0 30
Friday	42 5-16	92½	12 10	3 87½	20 30
Saturday	42 5-16	92½	12 10	3 90	20 30
Monday	42⅜	92½	12 00	3 87½	20 35
Tuesday	42 7-16	92⅜	12 00	3 85	20 50
Wednesday	42½	92½	12 00	3 85	20 50

NEW YORK, Aug. 28.—In copper a fair movement for use prevails. Lake, 12c; Western, 11c; casting brands, 10½c. Consumers seem more inclined to use Lake at 12c than before. Pig lead is in fair demand at 3⅞c. Refined borax is in moderate supply with a good demand ruling. Tin has been strengthening in sympathy with foreign markets.

San Francisco Metal Market.

WHOLESALE.
THURSDAY, August 29, 1889.

ANTIMONY	17 @	—
BORAX—Refined, in carload lots	7¼@	7⅝
Powdered " " "	7¼@	
Concentrated " " "	— @	6⅝
All grades jobbing at an advance.		
COPPER—		
Bolt	21 @	22
Sheathing	22 @	24
Ingot, jobbing	15 @	16
do, wholesale	13 @	14
Fire Box Sheets	22 @	24
LEAD—Pig	4 1/2@	—
Bar	5 @	—
Sheet	7 @	—
Pipe	6 @	—
Shot, discount 10% on 500 bags Drop, ₱ bag.	1 45 @	—
Buck, ₱ bag	1 65 @	—
Chilled, do	1 85 @	—
STEEL—English, lb	16 @	20
Canton tool	9 @	9¾
Black Diamond tool	9 @	9½
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4½@	—
TINPLATE—B. V., steel grade, 14x20, P. S.	4 80 @	—
B. V., steel grade, 14x20, spot	4 85 @	—
Charcoal, 14x20	6.25 @	6 75
do roofing, 14x20	5 12½@	5 25
Pig tin, spot, ₱ lb	21 @	21½
do, do, prompt shipment	— @	—
QUICKSILVER—By the flask	47 50 @	50 00
Flasks, new	@	—
Flasks, old	3⅝ @	

	Spot.	To Load.
IRON—Glengarnock ton	27 00 @—	—
Eglinton, ton	26 00 @—	—
American Soft, No. 1, ton	— @31 00	—
Oregon Pig, ton	— @30 00	—
Clay Lane White	— @24 50	25 @ —
Shotts, No. 1	28 50 @29 00	— @ —
Bar Iron (base price) ₱ lb	2½@ 3	— @ —
Chrome iron ore, ₱ ton	— @10 00	— @ —

Lumber.

Fine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$19 00	$16 00
41 to 50 ft	20 00	17 00
51 to 60 ft	22 00	19 00
61 to 70 ft	26 00	22 00
1x3, fencing	21 00	18 00
1x4, "	20 00	17 00
1x3, 1x4 and 1x6, odd lengths	18 00	15 00
Second quality	16 00	14 00
Selected	23 00	21 00
Clear, except for flooring	30 00	27 00
Clear for flooring	1 00	.....
Clear V. G. No. 1 flooring	5 00	.....
Firewood	13 00	9 00
Dressed Pine, flooring, No. 1, 1x6	31 00	28 00
No. 1, 1x4	32 00	29 00
No. 1, 1¼x4, 1¼x6, and odd sizes	36 00	32 00
All sizes, No. 2	26 00	23 00
Stepping, No. 1	43 00	34 00
Stepping, No. 2	33 00	24 00
Ship timber and plank, rough	26 00	17 00
Selected, planed 1 side, average 40 ft	28 00	23 00
" " 2 " " "	30 00	25 00
" " 3 " " "	32 00	27 00
" " 4 " " "	34 00	29 00
Deck plank, rough, average 35 ft	34 00	31 00
Dressed, average 35 feet	39 00	34 50
Pickets, rough, B. M	19 00	15 00
1x1½, 4 ft long, ₱ M	5 50	4 00

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	$ 7½ @ 7½	Cardiff	50@10 00
Liverpool St'n	7 50 @ 7 75	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	8 00 @ 8 50	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Gilman	6 00
Scotch Splint	9 00	Seattle	6 00
West Hartley	11 00	Coos Bay	5 00
Greta	8 00	Cannel	10 00
Westminster Brymbo	9 00	Egg, hard	17 50
Nanaimo	9 00	Cumberland, in sacks	19 00
Sydney	8 00	do, bulk	18 00
Jackson	6 00		

COKE—Eng., ton, spot, in blk & aks, resptvly.. 17 00 @20 00
Do, do, to load.. 13 00 @13 25

Prices of Powder.

The California Powder Works give the following as prices of Hercules powder, f. o. b. at works:

	Carloads.	Less than Carloads.
No. 1 dynamite	$ .33	$ .35
No. 1* "	.28	.30
No. 1** "	.23	.25
No. 2 "	.18	.20
No. 2* "	.16¾	.18¾
No. 2** "	.15½	.17½
No. 3 "	.13	.15

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Occidental Cons., Aug. 24, $5000; Justice, 24, $5201; Hanauer, 24, $5500; Cons. Cal. and Virginia, 24, $44,768; Commonwealth, 27, $26,000; Hanauer, 25, $2750; Hanauer, 27, $3800.

FREEMAN DRY PROCESS.—Mr. James B. Freeman, the inventor of Freeman's dry-process amalgamator, is in the city. He has one of his machines in the Mechanics' Fair, where it will be in operation daily. An exhibition will be given on Monday next at 2 P. M., when a public test will be made.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Argenta M Co	Nevada	19	10	July 20	Aug 21	Sept 16	E M Hall	314 Montgomery St
Alpha Con M Co	Nevada	3	25	July 15	Aug 22	Sept 12	C E Elliott	309 Montgomery St
Bulwer Con M Co	California	5	25	Aug 6	Sept 12	Oct 10	L Osborn	309 Montgomery St
Calaveras Blue Gravel M Co	Cal	3	3	Aug 3	Sept 16	Oct 2	B Burris	240 Montgomery St
Challenge Con M Co	Nevada	5	50	Aug 6	Sept 9	Sept 30	C L McCoy	329 Pine St
Chollar M Co	Nevada	27	50	July 15	Aug 20	Sep 10	C E Elliott	309 Montgomery St
Con New York M Co	Nevada	1	25	Aug 14	Sept 18	Oct 9	C E Elliott	309 Montgomery St
Crown Point M Co	Nevada	51	50	July 9	Aug 12	Sep 2	J Newlands	329 Pine St
Eu t Mt Diablo M Co	California	5	10	July 18	Aug 22	Sep 16	R W Heath	318 Pine St
East Sierra Nevada M Co	Nevada	1	10	Aug 8	Sept 13	Oct 7	G E Spinney	310 Pine St
Gray Eagle M Co	California	14	4	Aug 13	Sept 16	Oct 8	O H Bogart	317 Pine St
Golden Fleece G'v'l M Co	California	14	17 00	May 21	July 20	Sep 16	W. J. Gleason	306 Market St
Grand Prize M Co	Nevada	21	30	July 27	Aug 30	Sep 20	R R Grayson	327 Pine St
Kentuck M Co	Nevada	19	30	July 30	Sept 2	Sep 20	J W Pew	310 Pine St
Mexican M Co	Nevada	38	25	July 9	Aug 13	Sep 3	C E Elliott	309 Montgomery St
Mineral King M & M Co	Arizona	3	10	Aug 22	Sept 24	Oct 21	P H Leonard	419 California St
Mono M Co	California	28	50	July 24	Aug 28	Oct 1	B L Burling	309 Montgomery St
Overman S M Co	Nevada	60	25	July 27	Aug 30	Sep 20	G D Edwards	414 California St
Palesade S M Co	Nevada	1	10	Aug 6	Sept 16	Oct 2	D Buck	309 Montgomery St
Savage M Co	Nevada	73	50	July 19	Aug 21	Sep 10	E B Holmes	309 Montgomery St
Scorpion M Co	Nevada	1	10	Aug 8	Sept 13	Oct 7	G R Spinney	310 Pine St
Southern Cal Coal & Clay Co	Cal	2	10	Aug 16	Sept 16	Oct 16	W G Mugan	10 California St
Utah Con M Co	Nevada	7	25	July 9	Aug 13	Aug 30	A H Fish	309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	MEETING	DATE
Chicago M & M	Nevada	W m Grant	520 Montgomery St	Annual	Sept 3
Gover M Co		Gray Drew	13 & 15 Fremont St	Special	Sept 4
Hector M Co		J B Hughes	517 Clay St	Annual	Sept 9
Occidental M Co	Nevada	W H Watson	302 Montgomery St	Annual	Sept 10

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Caledonia M C	Nevada	A S Cheminant	328 Montgomery St	08	Aug 6
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	July 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	July 25
Idaho M Co	California		Grass Valley	7.50	May 5
Navajo M Co	California	J W Pew	310 Pine St	10	Apr 1
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Aug 10

Mining Share Market.

The Comstocks the past week were quite active, with Mexican and Union the leaders in the north end, and Yellow Jacket and Crown Point in the Gold Hills. Values gradually advanced up to Monday morning, when they began to weaken under bear points of quite a setback soon. These points many were inclined to believe, owing to Ophir, Con. Virginia and Confidence having done very little. Prices so far have failed to go off to the extent the bears had been led to believe, yet they have faith in their points ultimately being correct. The bulls, on the contrary, have points that stocks are going higher, and appear more than pleased that the market recovers so quickly after each shading off. But it makes very little difference how the average outside dealer operates; it is only a question of time when he retires a loser.

The market so far acts as if it was purely manipulation, for, so far as we can learn, there is nothing outside of promising work to justify either present prices or activity. Yet the market often goes the highest when there is nothing made public to warrant an advance. In the outside stocks the Quijotoas have been fairly dealt in and at strengthening prices. The Tuscaroras have lagged, as if the manipulators are taking in stock at declining prices. Eureka Con. made quite an upward move on more favorable advices from the mine. As the stock is better held, these moves can be made more advantageously. The Bodies did not go up with the Comstocks, but they set off when the latter did. Now that the price is down the air is full of assessment talk on Bodie, with still lower prices to obtain. Mono lost part of its assessment.

The market opened strong this (Thursday) morning at higher figures, with Mexican the leader. After the call the market was still active, with a slight shading in values. The state of the market indicates that lower figures may obtain before the pool can force the shorts to fill. Outside stocks are dull and heavy for the Bodies, which is due to a 50-cent assessment pending on Bodie. The Quijotoas were firm, but the Tuscaroras were weak.

It is the general opinion that if the Savage Mining Co.'s managers wish to vindicate themselves from the charges preferred by the president and secretary of the Mining Stock Association, they ought to bring a criminal suit against the parties and a libel suit against the *Chronicle* for publishing the accusation.

From the mines our advices report that the north drift from the west crosscut No. 1, on the 1500-foot level of the Mexican, is extended 260 feet, with improvements reported as the drift is run north toward the Union line. Belcher is upraising in low-grade ore from the 1200-foot level toward the 1100-foot level. The Ward shaft is now repaired and timbered to the 1600 foot. In Potosi the ore body mentioned in last week's paper is stripped for a distance of 50 feet. The rock is white, 36 feet wide, and reported as low grade. The west drift on the 500-foot level of Yellow Jacket, which is being run for the gold ledge, is now in very nearly 550 feet. The west crosscut from the 500-foot north drift from the Yellow Jacket shaft, run jointly by Challenge, Confidence and Con. Imperial, is in about of 150 feet in good formation of quartz and clay. From the Quijotoas the work going on is all of an important character. More men are to be put to work, while the mill, with its full complement of stamps, will start soon. From the Tuscaroras the usual reports come to hand, while from the Bodies we are unable to get any information outside of that heretofore published.

THE whaling tender Thomas Pope arrived in port Wednesday night from the Arctic. The captain made a report in which he stated that the ocean was very clear of ice as far as Cape Lisbourn, but to the eastward of it the ice was quite heavy. The following is the catch of the whaling fleet up to July 20th: Barks Reindeer, 3; Helen Mar, 1; Hunter, 1; Northern Light, 2; Lagoda, 1; James Allen, 1; schooner Rosario, 1; J. A. Howland, 1; steamers Belvidere, 2; Lucretia, 2; William Lewis, 1; Thrasher, 3; Narwhal, 4; Beluga, 2; Orca, 1; Balæna, 1; and Jesse Freeman, 1.

THE POWDER POOL.—It is said the Vulcan Powder Company was offered a subsidy of $25,000 a year to suspend operations for five years. The company would not accept the proposition. Now it is said the Powder Pool has leased the entire plant and business of the Vulcan Powder Company for five years, at an annual rent of $20,000, which is considered more favorable to the company than if it went out of business entirely for the five years.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 7.		WEEK ENDING Aug. 14.		WEEK ENDING Aug. 21.		WEEK ENDING Aug. 31.	
Alpha	.75	1.00	.75	1.15	1.15	1.35	1.25	1.35
Alta	1.30	1.30	1.30	1.4	1.40	1.45	1 25	1 50
Andes	.50	.60	.55	.70	65	.75	.70	.80
Argenta	....	....	....	....	....	....	....	....
Belcher	2.15	2 55	2.20	3.05	2.75	2 95	2.90	3.10
Best & Belcher	2.70	3.15	3 00	4.00	3.40	3 80	3.60	4.00
Bullion	.40	.60	.50	.75	.65	.70	.65	.70
Baltimore	....	....	....	....	.30	....	.30	....
Belle Isle	.15	.20	....	....	....	....	....	....
Bodie Con	.70	1.00	.80	.90	.85	.95	.85	.95
Benton	....	....	....	....	....	....	....	....
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.15	.20	.10	.15	.10	.15	.10	.15
Commonwealth	3.05	4.00	2 45	3.2	2.50	2 60	2.50	2.60
Con. Va. & Cal	6⅞	7¼	7⅜	7⅞	7¼	7⅞	7⅜	7⅞
Challenge	1.50	1 8	1.45	2.20	1.80	2.15	2 00	2 20
Chollar	1.10	1.35	1.30	1.50	1.80	2.10	1 95	2.20
Confidence	5⅛	5⅞	5¼	6	6	7	6.50	....
Con. Imperial	.35	.45	.35	.55	.50	.65	.50	.55
Caledonia	.15	....	.15	.20	.20	....	.25	..
Con. Pacific	....	....	....	....	40	....	....	....
Crown Point	1.70	2.10	1.75	2.5	2.70	3.20	2 90	3.35
Crocker	.30	.35	.35	.40	.40	....	.35	.45
Central	....	....	....	....	....	....	....	....
Dudley	....	....	....	....	....	....	....	....
East E. & B	....	....	....	....	....	....	.10	.15
Eureka Con	....	1.50	....	....	1.35	1.50	1.40	2.75
Exchequer	.50	.60	.50	.70	.65	.70	....	.65
Grand Prize	.35	.45	.40	....	.35	.45	.35	.65
Gould & Curry	1.60	1.90	1.70	2.25	1 95	2.10	2.00	2.20
Hale & Norcross	....	....	2.70	3.10	2.90	3.15	2 95	3.20
Holmes	....	....	....	....	....	....	.60	.60
Independence	....	....	....	....	....	....	....	....
Iowa	....	....	....	....	....	....	....	....
Julia	.20	.30	.20	.25	.25	....	.30	....
Justice	1.30	1.55	1.40	1.60	1.45	1.60	1.40	2 00
Kentuck	....	....	.70	1.00	.95	....	.90	.95
Lady Wash	....	....	....	....	.35	....	....	....
Locomotive	....	....	....	....	.10	....	....	....
Martin White	....	....	....	....	....	....	....	....
Mono	.50	....	.50	.55	.35	.60	.55	1.10
Mexican	2.15	2 60	2.30	3.45	3.15	3.60	3.40	4 40
Mt. Diablo	....	....	....	....	....	....	....	....
Navajo	.40	....	....	....	25	.30	.25	....
North Belle Isle	1.00	1.25	.90	1.10	.80	.85	....	....
Niagara	....	....	....	....	....	....	....	....
Nev. Queen	1.00	1.30	.85	1 00	.85	.90	.70	.75
North G. & O	....	....	....	....	....	....	....	....
Occidental	1.85	2.10	1.90	1.95	1.80	1.95	1.85	1.95
Ophir	3.75	4.20	4.10	5.25	4.75	5	4.85	5.25
Overman	65	.75	.60	.90	.75	.90	75	1.20
Potosi	1.20	1.40	1.25	1.65	1.50	1.70	1.50	....
Peerless	.25	.3	.25	.40	.25	.35	.30	.35
Peer	.10	.15	.10	.20	.15	.20	....	....
P. Sheridan	....	....	....	....	....	....	....	....
Silver Star	....	....	....	....	....	....	....	....
Savage	1.15	1.40	1 25	1.75	1.50	2.10	2.25	
S. B. & M	1.40	1 65	1.40	1 75	1.65	1 90	1.80	1.90
Sierra Nevada	1.95	2.15	2.00	2.70	2.50	2.80	2.60	3.10
Silver Hill	.35	.40	.40	.45	.40	.50	....	....
Silver King	....	....	....	....	....	....	....	....
Scorpion	....	....	....	....	....	....	....	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	....	....	....	....
Union Con	2.20	2.60	2.45	3.15	3.00	3.30	3.25	3.95
Utah	.55	.70	.50	1 10	.95	1.10	1.05	1 20
Yellow Jacket	2.30	2.65	2.35	3.30	3 00	3.30	3.00	3.30

Sales at San Francisco Stock Exchange.

THURSDAY, Aug. 29, 9:30 A. M.

100	Kentuck		90c
1140	Mexican		5 25
100	Alta	1.4	
100	New York		25c
450	Andes	.80c	
50	Occident		1.80
200	Belcher	3.10	
700	Ophir		5.25
140	Best & B	3.90	
150	Overman		1.25
400	Bonanza	20c	
200	Potosi		1.65
100	Bullion	70c	
150	Savage		2 35
240	Crown Point	3.30	
500	Scorpion		20c
450	Con. Imperial	5c	
300	S. B. & M		1.90
330	Con Va & Cal	7.75	
350	Sierra Nevada		3.25
200	Gould & Curry	2.25	
200	Utah		1.20
100	Grand Prize	65c	
510	Union		4.05
100	Hale & Nor	3.20	
200	W Comstock		60c
260	Justice	2.00	
100	Yellow Jacket		3.35

THE NEW GOLD CERTIFICATES.—In accordance with the instructions recently issued by the United States Treasurer the Sub-Treasury in this city is prepared to issue gold certificates in denominations of $5000 and $10,000. These certificates are payable on demand at the Sub-Treasury, but only to order of the party to whom issued, and not merely on demand like all other denominations of currency.

A CONTRACT has been let by the War Department to the San Francisco Contracting Co., to build an iron wharf at Black Point, this city. Piles, flooring and everything will be iron. The experiment of having an iron wharf is owing to the wooden wharves at the Point having failed to stand any length of time.

W. L. SCOTT of Pennsylvania has telegraphed to his superintendent to discharge all the employes of the Spring Valley mine (Illinois) not absolutely needed, and prepare for a shut-down of six months or a year. The mines, he said, will not be opened again if they cannot be operated on a paying basis.

The Charleston's Trial.

The cruiser Charleston returned from her ocean trip on Monday morning, having succeeded in making 19½ knots. The official test commenced precisely at 10 o'clock, and at the close of the first quarter of an hour the engines were making 114 revolutions per minute. During the first hour the highest rate made by the engines was 118½ revolutions. The average revolutions of the engines during the first hour was 113 7-10, or nearly seven more than on her previous trial trip. Her rate of speed was 18 knots.

The Charleston was a little north of Monterey when the second trial commenced. During the first half hour's run the propellers made an average of 117 revolutions per minute. This average was maintained with a slight increase during the entire run, the engines at certain times making 120 revolutions per minute. The average revolutions of the engines during the afternoon run was 117 3-10. During this time the patent log recorded a speed of 18¼ knots per hour. Besides the record as indicated by the log, shore bearings were taken, and these showed that the Charleston was making an average speed of 19 3-10 knots per hour. The safety valve was blowing off all the time, indicating that the boilers were making more steam than the engines were able to use. The engines worked to the entire satisfaction of every one. Not a hitch was discovered anywhere. There was not at any time the slightest indication of heating of the engine slides, which caused the trial run last May to be a failure. The average horse-power developed was 6700; the vacuum was never below 26.

The vessel will now go to Mare Island to receive her equipment. The results of the official tests were very satisfactory, and no other will be made unless the builders desire to show a higher horse-power than was developed.

THE Atlas Iron Works are branching out and will have a new foundry in South San Francisco near the rolling-mills. The main building will be of corrugated iron and fitted within with all modern improvements in machinery. The entire structure will cover nearly a block square. The water at that point is very deep, and will permit the docking of the largest steamer at the wharf of the works. A railroad track is to be run in from the land side. Two traveling cranes are to be rigged up, so that a heavy boiler or a large piece of machinery can be handled easily, and can be placed on a vessel or car with comparatively little expense. Two cupolas will also be constructed. In speaking of the new works Mr. Jardine said that the company did not propose to confine itself to shipbuilding. "A considerable portion of the plant in the present works," said he, "will be used in the new building, and I shall still keep a portion of my present shop. I have great confidence in the ship-building interests of California, and I think she has a glorious future before her in that line. The steamers which have been turned out in San Francisco have proved most successful, and the industry is growing. No less than 20 steam schooners were built for Alaska alone last year, and as that country opens up more will be needed, to say nothing of our own coast and that of Mexico and Central America."

DECADENCE OF A MINING CAMP.—A gentleman who was lately in Tuscarora informs a Virginia City *Enterprise* reporter that the town is being deserted by the miners. They are leaving on horseback, muleback, wagons, buckboards, stages and on foot. The weather being pleasant, they need no more for a traveling outfit than a pair of blankets, some crackers and cheese, a plug of tobacco and a bottle of Tuscarora elixir. The Commonwealth mine closed down a few days ago, throwing 200 men out of employment in its mill and mine. A month ago there were 400 miners employed in the mines of Tuscarora, and to day there are not 75. Sunday 25 men left the camp on horseback for the Idaho country, seven left in a private conveyance, two stages were loaded down to the guards and a number "hoofed" it out of town.

LOW-GRADE TAILINGS. — Six mile canyon blanket-sluicers, who have no pans to amalgamate the sulphurets saved from tailings, are not making miners' wages and several of them have suspended operations. This is due to the low percentage of metal left in tailings flowing from the California panmill since the adoption of the Boss & Rae amalgamating processes, through which nearly 90 per cent of the assay value of ore pulp is saved—nearly 20 per cent above the average of ten years ago.—*Virginia Chronicle.*

NEVADA BULLION.—Of the $520,338,579 produced by the mines of the State of Nevada, $159,150,487 was in gold and $361,188,092 in silver. The gold is over 30 per cent of the gross yield. Of the total amount it is estimated that $326,804,600 has come out of the Comstock lode. Eureka district produced altogether $57,558,459, of which $10,070,000 was lead and the balance gold and silver.

THIS year's yield of the Broken Hill Proprietary Company's mines at Broken Hill, New South Wales, is estimated at $5,000,000 in silver bullion. These mines are under the superintendency of W. H. Patton, formerly in charge of the North-end Comstocks.

About Obtaining Patents.

Patents are Virtually Contracts.

The Patent Law provides that in case a patent, which is the evidence of the contract, is not executed in compliance with the requirements of the law, it may be annulled and rendered void. Hence, it is of the greatest importance to every inventor that his patent or contract be skillfully and accurately drafted, in order that it may afford him complete protection for his invention during the life of his patent.

Secure a Good Patent.

An inventor should first ascertain whether or not his improvement has been patented to another. This requires an exhaustive search among all the patents in the class to which the invention relates. If, by this "preliminary examination," the improvement is found to have been previously invented, our client will receive, for the small sum of $5 for the examination, a verbal or written report showing definitely wherein his invention has been anticipated, thereby saving him further expense and perhaps much time, anxiety, etc.

To avoid all needless delay, however and secure patents at the earliest moment practicable, inventors will do well to forward a model, drawing or sketch, with a plain, full and comprehensive description of their invention (stating distinctly what the particular points of improvement are), with $15 as a first installment of fees. If the improvement appears to us to be novel and patentable, the necessary papers for an application for a patent will be prepared immediately and forwarded to the inventor for his signature. When he receives the application and finds it duly prepared, he will carefully sign and return the same plainly addressed to us, with postal money order or express receipt for our own fee. The case will then be promptly filed by us in the Patent Office, and vigorously prosecuted to secure the best patent possible. [This course is the most expeditious and satisfactory, as no time is lost in transmitting correspondence relative to the preliminary steps.] When the patent is allowed the inventor will be duly notified, and on sending the final Government fee of $20 to us, we will order the issue of the patent, and forward the same as soon as it is secured from the Patent Office.

The payments are thus divided and made easy. We make no pretense of doing cheap work, in order to entice custom, nor do we afterward make additional charges to bring the bill up to a fair compensation. We do our work honestly and thoroughly, and we never give up a case so long as there is a chance of obtaining a patent. The Agency charge, including drawings, rarely exceeds $40, and for this we do all we can without appealing the case.

Models and Drawings.

Models are now seldom required by the Commissioner of Patents, and generally only in intricate cases. Perfect drawings of practical working machines are more satisfactory to the Patent Office than the old cumbersome system of storing up an immense bulk of countless models.

Drawings or sketches, sufficient to illustrate the invention clearly, with a description that will enable us to make a full set of perfect drawings for the Patent Office, is all that we require. A model will answer our purpose as well, however, in cases where the inventor can more easily furnish it.

The value and even the validity of a patent often depends on the character, clearness and sufficiency of its drawings. There are thousands of existing patents in which the improvements are but partially or poorly illustrated in the drawings. When an attempt is made to dispose of such patents, the vagueness and defects of the drawings often prejudice capitalists and manufacturers against the invention, while in reality it may be of great value, and would meet with ready sale had it been skillfully, completely and artistically portrayed. In all cases prepared by us the drawings are made under our personal supervision, by skilled draftsmen in our constant employ, and every precaution is taken to have the invention fully and clearly shown by different views, so that the improvement will be readily understood by the Examiners in the Patent Office, and comprehended by the public when the patent is granted.

Advantages to Inventors on the Pacific Coast.

The firm of DEWEY & Co. has edited and published the MINING AND SCIENTIFIC PRESS continuously since 1860, a period of 26 years. Few agents, who are still engaged in the business, have had so long-extended practice in patent soliciting. The members of the firm give personal attention to the applications intrusted to their care; and their familiarity with inventions and with local affairs in the Pacific States and Territories, enables them to understand the wants of inventors on this coast more readily and thoroughly, as we believe, than any other agents in America. Thus there is saved a great deal of the time which ordinarily—when distant agents are employed—is wasted in preliminary writing back and forth.

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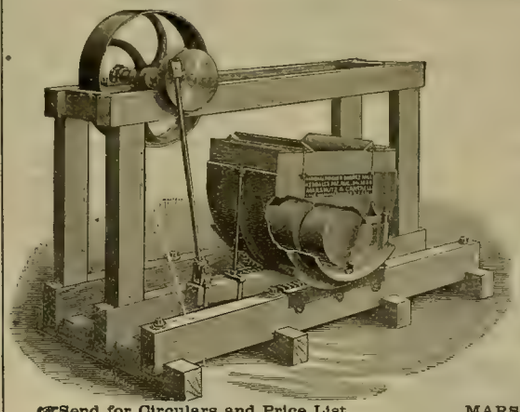
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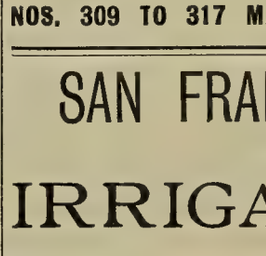
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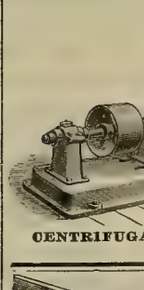


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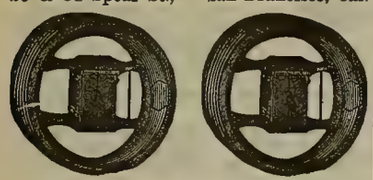
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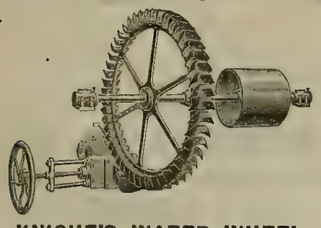
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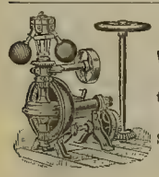


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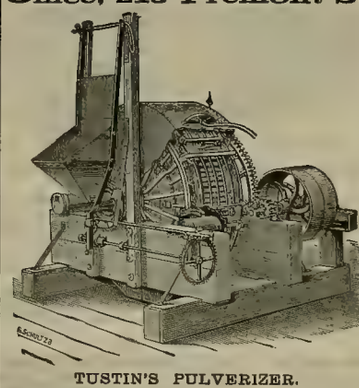
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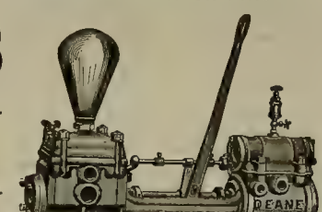
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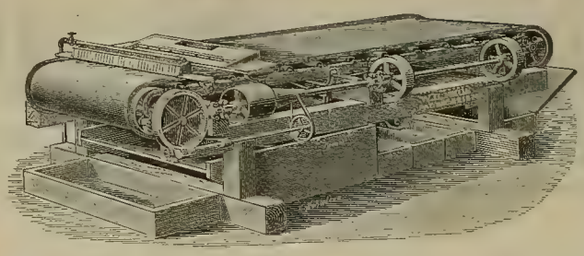
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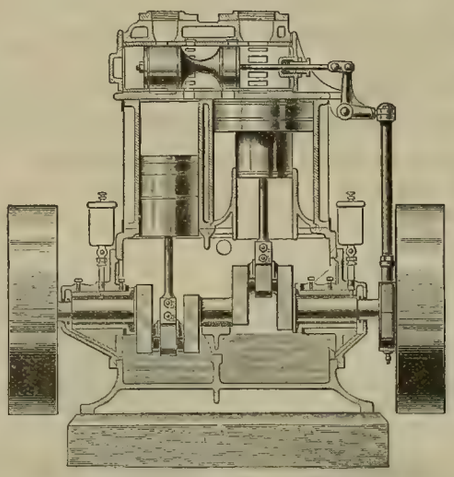
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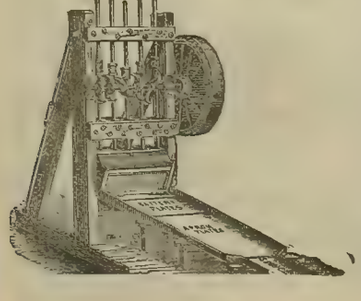
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TWENTY-PAGE EDITION.

VOL. LIX—Number 10. DEWEY & CO., PUBLISHERS. SAN FRANCISCO, SATURDAY, SEPTEMBER 7, 1889. Three Dollars per Annum, Single Copies, 10 Cts.

FIG. 8.

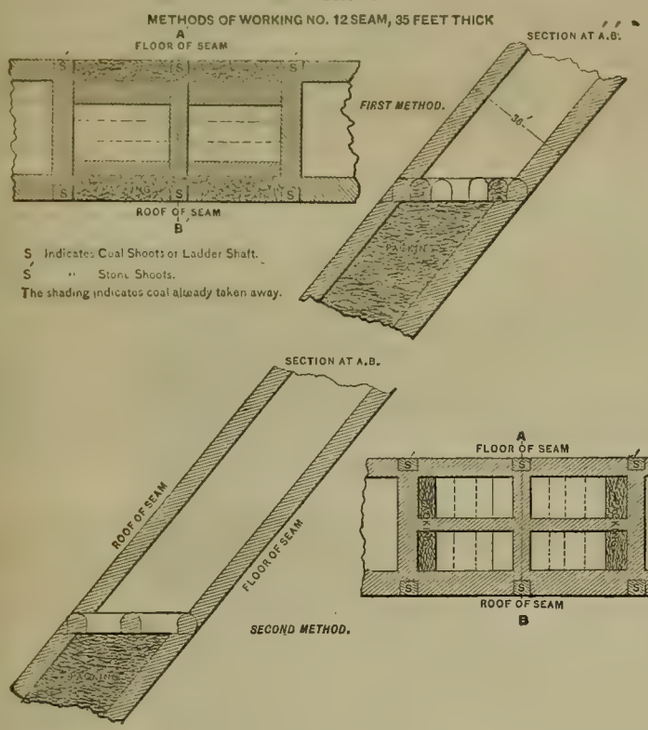


FIG. 6.

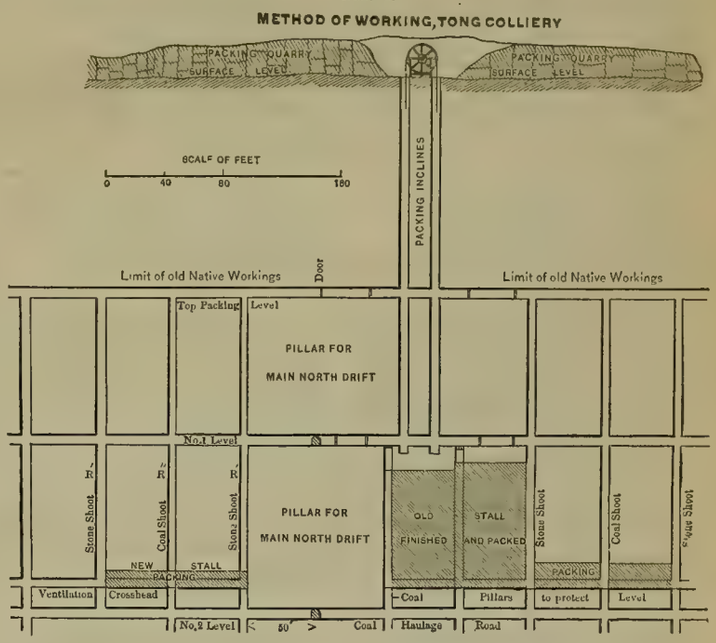


FIG. 5.

PLAN OF NO. 2 LEVEL, TONG COLLIERY.

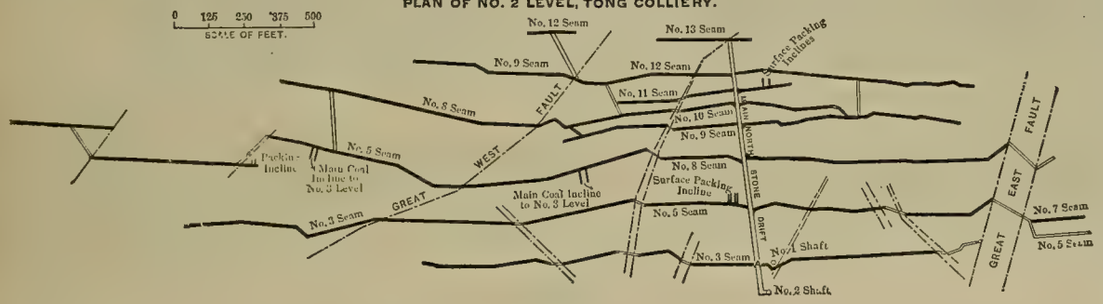
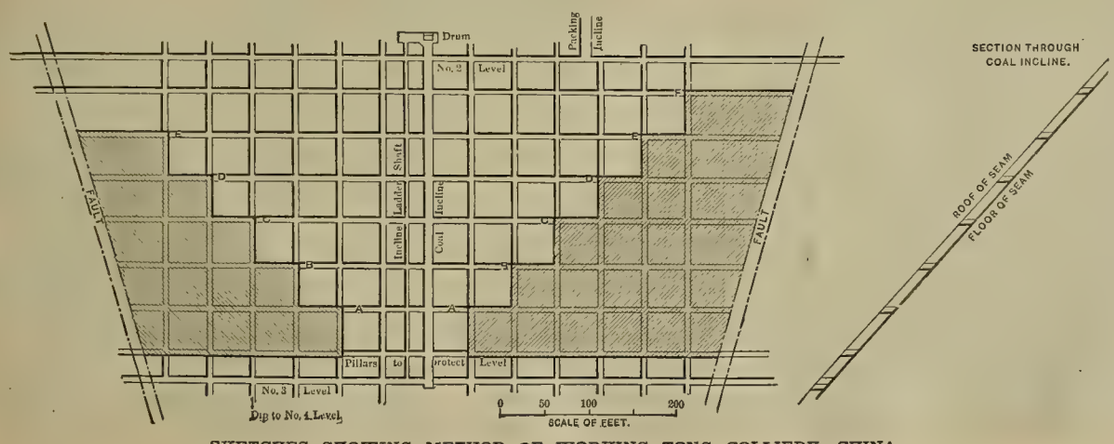


FIG. 7.

METHOD OF WORKING NO. 5 SEAM.



SKETCHES SHOWING METHOD OF WORKING TONG COLLIERY, CHINA.

Working a Chinese Coal Mine.

In last week's PRESS we gave a map of the Kaiping coal-field, North China, and a sectional view of the Tong collieries. In this issue we give some engravings showing the method of working the mines.

As soon as the shaft reached its required depth a crosscut was driven north to cut all the coal seams, and when any seam, as, for instance, *A*, was reached (No. 5 seam, Fig. 5), it was followed along the strike east and west. In studying Fig. 5 it should be borne in mind that the heavy black lines indicate the drifts or gangways, not necessarily the coal. Thus it will be seen that by reason of faults throwing the seams, the gangway which is at the main stone-drift, in No. 5 seam, is found at one end in No. 7 and at the other in No. 3.

After extending these levels on each side of the crosscut a distance of 50 feet, winzes *R'*, *R* (Fig. 6) were driven up to No. 1 level for ventilation. These winzes at a distance of 20 feet above No. 2 level are connected by a ventilation cross-head. As the drifts advance, winzes are thus driven up at intervals of 50 feet. When three of them have been driven to No. 1 level a stall can be worked at once. *R'*, *R'* are stone shutes, and *R''* is the ladder shaft and coal shute.

The details of working a stall are as follows: (Fig. 10, page 189.) Coal-boxes 2 feet square by 8 feet long are put up from the bottom or No. 2 level to the ventilation cross-head for sending coal out of the stall, and ladders 12 feet long are put in to communicate with No. 1 level. Bridge rails of 14 pounds per yard are then laid from the ladder shaft to the stone shute.

In mining the coal the miners begin at the stone shutes and work to the ladder shaft. Round props of 6-inch pine, 4 feet apart, are put up close to the coal as the cutting face advances. The empty space left by cutting away

(*Continued on page 189.*)

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

A Californian at the Paris Exposition.

MESSRS. EDITORS:—We left London July 10th at 10 A. M., via Folkstone and Boulogne, and arrived in Paris at 6 P. M. We put up at the private hotel, 20 Rue d'Antin, Avenue de l'Opera.

The transition is so great for such a short space of time that I hardly know whether I am in dreamland or had the nightmare. So few people speak the English language that we find it hard to get along sometimes. We have to use pantomime, pigeon English and bad French. In the banks and large business houses they have men or women who speak English. It is almost impossible to find a policeman or cabman who can speak English. All of them understand Exposition, and when we want to return home we show a card of the hotel and street. This city is entirely different from anything we have seen yet. There is a greater uniformity in construction of buildings and material. Block after block is built the same hight and with same finish.

The Boulevards are Wide,

With a row of trees on each side, and sometimes from one to four rows through the center of the street. The streets are nicely paved with stone, wood or concrete, and are swept every night by horse-power. Carts are kept on the move to carry off the filth that is collected by machine sweeping and by the women with long brush brooms. Some of the pavements are from 20 to 30 feet wide, and are occupied in front of a saloon by chairs and small tables by those who wish to rest and chat and drink a glass of wine or beer and munch some dry bread and do a large amount of talking.

There are a great many strangers in Paris and times are very lively. A large amount of money will be left in this city by the tourists, who seem to have plenty of it. A person can spend a lot of money here, or he can get along very reasonably for an Exposition year. The cabmen had a strike awhile ago and charged exorbitant prices, but their charges are in the bounds of reason now.

A cabby brought four of us home from the Exposition the other night and charged us three francs (60 cents) for a distance of at least 2½ miles. There are only a

Few Horse-Cars Here,

And they do not run very near our stopping-place. They charge about three cents for a ride. The Seine is full of passenger steamboats, which only charge two cents, but still we have to walk three-fourths of a mile. Most of the conveyances are one-horse and one-seated cabs, with four wheels. There is the regular public bus, with double or upper deck, and plenty, as it would seem, of conveyances got up especially for the occasion.

After 9 o'clock it is hard to get on to a bus, unless you stop at a station and get a ticket with a number on, and then each one must take his turn according to number. The horses have been worked so hard since the opening of the Exposition that they are almost lifeless, and it takes considerable of the cracking of the whip, which a Frenchman is noted for, to keep them on the move. I predict that half of the horses which live to see the end of the Exposition will be worthless.

Most of the horses that work in the buses, street cars, and heavy carts are the gray Normandy or Percherons. They have not as good horses here and they do not take as good care of them as they do in London and Scotland. Have not seen a light carriage or buggy on the streets.

A Magnificent Exposition.

I went to our Centennial in 1876, to our Cotton Exposition at Atlanta, Ga., the Cotton Exposition in New Orleans, and I say, if all were put together they would not come up to this. I said when I examined our Centennial I should not live to see its equal. If I can govern myself I will not make such an extravagant prediction again. It would seem that it would take the combined world to surpass this. I cannot comprehend the mind that has the genius to conceive this, or the daring audacity to successfully carry it to completion. It seems for adaptability and tact and for means to carry out, the Frenchman has no superior. I met a minister in London from Oben, Scotland, who had just returned from Paris, where he had been on his wedding tour, and he said the Exposition and the Eiffel tower did not come up to his expectation. I was quite disappointed at his report. I forgive him now, for I know when I was on my wedding trip I thought Lake Erie a millpond and Niagara the water pouring over the dam. He said Paris was such a gay city and its citizens so full of pleasure that they had no time to think of death or prepare themselves for the other world.

At Philadelphia and New Orleans there was plenty of ground room, and the exhibition was contained in a few large buildings. Here the ground room is scarce, or a good deal cut up, and the exhibition has to be in a good many small buildings, outside of the one main building. There must be some first-class organizers here in order to get up the buildings as nicely and tastefully as they have and classify the exhibits. I have tramped and tramped and tramped, and the more I see the more bewildered I become.

The U. S. Exhibits.

The United States, as far as I have seen, have three very creditable exhibits: One in the art department, one of machinery, and the other, for want of a better name, call it useful arts, and still another in that indispensable household help, the sewing machine.

I think the machine department the most complete ever got together. They have motors of all kinds—air, gas, steam, electricity, water and sundry ones beyond my comprehension.

The drawings, maps and models of the civil engineering department seem exhaustive.

I have not seen one-half of the art gallery yet, but I have seen enough to cover a ten-acre farm. One picture, "The Crowning of Josephine by Napoleon," 20x30 feet in size, would take a person well up in art and history several hours to fully appreciate and comprehend.

Here is a grand school to study art. The student need go no further; nothing is forgotten or left out. The creation of genius, or the copy of nature, has had its full sway. I wish I had the gift of language to describe some of the fairy statuary pieces with the fountains in full force. I do not like to describe so beautiful and fairy-like scene with imperfect language. They use water with a lavish hand but with beautiful effect. I have attended the fair five times, and to-day I went over acres of ground that I had not visited before.

The Oriental Exhibits.

I thought the natives of Eastern and Oriental countries were located near the River Seine, but I see I am mistaken and have not seen half of them. They are assigned a piece of ground running back at right angles from the river, I know not how far.

Here is the grandest opportunity to study, as it would appear, all nations of the earth, their modes of living, dressing, habits of industry and mechanism, animals, architecture, and food and manner of preparation.

Each nation has brought its hut, cave, tent, house or habitation with it. They have brought their primitive wooden looms with them for weaving different fabrics, their agricultural and mechanical tools, their boats and fishing tackle, their bamboo and split bamboo houses, their needles and knitting apparatus, paint brush, pot and tools, and are at work laying Mosaic pieces. They have their large and long-horned cattle from India, their two beautiful gray mares with their foals from Arabia. Hundreds of trinkets that they make are offered for sale.

A Chance Acquaintance.

I was passing by one of their booths, or huts, when a big, fine-looking fellow came up to me and said, in good English, "How do you do?" and grasped my hand and gave me a good shake. He said: "I am a Yankee as well as you," and ordered his assistant to draw two glasses of pineapple water, which was well appreciated, I being a little warm. I asked him where he had learned to speak English so well. He said he had been six years in the American navy. I offered to pay him for the drinks, but he would not accept. He felt it a privilege to treat a Yankee. We shook hands, and I said: "I will see you again."

Some were regular negroes, with short, curly hair, from Algiers, some from the Congo, Turks, Egyptians, and one race looked like the Chinese, but did not shave their heads. They wore a sort of turban. Natives from Soudan were there, and showed two massive logwood or mahogany doors that had been used in their forts and had been pierced by cannon-balls, evidently by their enemies. One nation had its cart drawn by natives. It consisted of massive wheels, bamboo or wicker-box and top, with hard-wood pole running through the hubs far enough to fasten into a frame outside the wheels that supported the box or body. There was no iron tire in the wheels and the felloes were kept together by a rabbet running from the middle of the outer circumference of the wheel toward the hub. It was a very Babylon of voices and nations. The directors have built a great many fancy and extravagant-shaped houses for these foreigners to vend their wares in.

The Eiffel Tower

Is the masterpiece of the Exposition. It appears at all of these great Expositions they have some leading feature. At the Centennial it was a bell with a crack in it, at New Orleans a tiny bale of cotton, at Paris the Eiffel tower is stamped on most everything, and at my breakfast, if I find the Light Brahma has not stamped the Eiffel tower on her shell, it is a good cause for pronouncing it overripe.

Three of us estimated yesterday that the foundations on which the four legs or supports of the tower stand cover an area of nearly two acres. The arches, platforms, the circular tapering, the finish at the top, and the maze of bracing are fine specimens of mechanical skill and cause much wonderment. There are three different lifts or elevators, or in other terms, you have to use three different ones before arriving at the top.

When I look through a little piece of glass about the size of a small bird's eye, inserted in the pen-holder that I am writing with, I find quite a description of the tower. It says it is 300 meters high, a little less than 1000 feet. A meter is three feet three inches and six-tenths, or about 39⅓ inches. All five of us started to go to the top, but on account of there being such a crowd we only went up to the second lift, and will go up to the top some day when there is not such a crowd present.

At the first platform it seemed like a small village. There are restaurants, drinking saloons and booths where small articles are sold. The second lift presents one of the finest of views of Paris and the surrounding country. It seems more like a painted city than one of reality. I should have said before that there were four lifts from the ground to first platform, and two from first to second, and one from second to top, and a continuous stream of people going up and coming down. Every one who goes to Paris wants to ascend the tower. Eiffel has a lease of the ground for 20 years, and then it belongs to the city.

Paris, July 18th. DANIEL FLINT.

A Bad Mining Law.

Comments on the Stewart Bill.

EDITORS PRESS:—While Mr. Stewart is doing much in the interest of the mining fraternity, we cannot indorse all of his aims as set forth in the PRESS of Aug. 10, 1889.

There is no law in existence that so retards the development of the mining resources of the country as that which compels an honest prospector to do the representing of worthless co-owners in order to prevent the forfeiture of his own rights. It is a poor law that compels a man to labor in the interest of one who will not labor for himself.

For instance, when James Faithful, Pete Dolittle, and Bill Bilk became co-owners in a mining claim, Bill Bilk congratulated himself that James Faithful is not only hopeful of success, but a hard worker besides.

So he said to himself: "I'll just let my co-owners perform the assessment work, and if the vein proves to be worthless they may advertise me out and take it for their pains; but if they make a lucky strike I'll then have no difficulty in rustling up the 'stuff' to pay my portion, and claim my share of the ore as well as to retain my interest in the bonanza."

As to Pete Dolittle, he intends to help develop the claim, but would a good deal rather hang around the saloons to play cards and drink rotgut; and when he does attempt to perform a little work don't know how to go about it; hence, after a few vain efforts at something that worries him a little he starts off in ill humor, curses his luck, and gets on another spree.

Now James Faithful, who, if sole owner, or with agreeable co owners, would have worked zealously to develop the claim, under present circumstances, rather than be the slave of worthless co-owners, reluctantly abandons the claim, which is subsequently jumped by Jack Sharp, who is a gambler by profession, and never prospected an hour in his life, but is always on the lookout to speculate on the labor of others.

The important question now is, "Why did Jack Sharp have a better right to relocate that claim than James Faithful?" I say most emphatically—when a co-owner does the full representing of a mining claim, he is more justly entitled to all of it than a stranger would be were all the co-owners to abandon it. The stranger does not have to advertise. And a man should not be put to unreasonable expense to advertise his co-owners for *any* length of time.

Let him post a notice of relocation on the claim in a conspicuous place and have said notice recorded within a reasonable time, and if any co-owner acts unjustly in this, let him be prosecuted for attempting to receive value under false pretense, or on some other charge as the law may prescribe.

The above illustration does not show all the evil effects. Presuming that James Faithful concludes to perform all the assessment and acquire title to all the claim by advertising out his co-owners, he will cease development just as soon as the limit prescribed by law is performed. Moreover, he may do "deadwork" rather than to expose any body of ore that he is led to believe exists on the claim.

Thus year after year rolls by, leaving the country undeveloped, and no one but a prospector can know what a curse such law is. Regarding the relocating of a claim we do not consider it just to prevent any prospector from relocating a claim which he formerly occupied.

He may have spent years of privation and hardship, and finally through force of circumstances aided by discouragement, he abandons the claim and returns in subsequent years to find it had been located and abandoned in the intervening time by other parties; and now when greater experience and more means would enable him to develop it, the law prevents his action, thus forcing the ground to lie idle indefinitely and preventing an honest prospector from reaping the rewards of his early labor.

Or, in another case, the former occupant returns to find a portion of the claim occupied. He does not dare to relocate to adjust his lines to the present situation, so it is left unoccupied or falls into the hands of others.

A law that we should have is, one to require $100 worth of improvements to be made for the first year where the location is made on an old discovery of which the locators were not the original discoverers, excepting such locations as shall be made within 90 days of the expiration of the representing year.

This would prevent Dolittles and Sharps from locating and holding old discoveries for speculation, trusting to the labor of others to open up the district and enhance the value of undeveloped claims.

A Montana law, which says that "the relocating of a mining claim by its occupants does not exempt the same from the annual expenditure, but such must be performed just the same as if it had not been relocated," fills all requirements to prevent fraud in cases where prospectors jump their own claims to avoid doing the assessment work.

My quotation may not be accurate, but the reader will understand the meaning, and bear in mind that the writer is a prospector, not a lawyer.

Hoping that the honorable gentleman from Nevada, as well as Mr. Carter from our own Territory, may see and act on these suggestions, we promise them a prospector's sincerest thanks.

Glendale, Montana. HENRY W. BROWN.

THE MINERAL PALACE.—A dispatch from Pueblo says the decisive meeting of the mineral palace enterprise was held, and the North Side and South Side got to bucking against each other, with the result that over $200,000 was subscribed by both together. The North Side, however, offered total subscription of $110,000 and captured the prize. It will be located in the northern suburbs. The capital stock was increased to $150,000 and about half the increase was at once subscribed for. The architect's plans have been accepted and show that it will be a magnificent creation, far excelling in richness and splendor any of the "palace" novelties yet presented to the public. The building will be in Egyptian style, in three great domes surrounded by an open colonnade. The pillars and columns will be respectively of stone and silver ores representing every quarry and mine in Colorado, and the domes will be lined with polished metal.

THE FORTY-NINERS.—The Society of California Pioneers of New England will revisit the scenes of their labors next spring. From a prospectus issued by Wm. H. Thomas, the president of the society, it is learned that they will leave Boston on a special train April 4, 1890. They will come by the Santa Fe and A. P. roads and make a few days' stay at the cities of Southern California. From thence they will journey to Sacramento and remain for three days, giving all a chance to visit their old mining camps. The circular says that here they will "probably have an evening reception at the State House by the Governor, if he is not absent from the city." Then they will go to San Francisco and San Jose and back to Sacramento, whence they will go East by the Central Pacific and the Denver & Rio Grande roads.

THREE expert miners, J. M. Owens, Thomas Owens and William Ellis, have been purchasing machinery and implements for use in opening a fine slate quarry in Calaveras county. The quarry is situated about three miles southeast of Copperopolis and is distant 12 miles from Milton, the nearest railroad shipping-point. The stone is fine-grained, dark blue in color and can be split to any desired thickness. Slabs can be cut out in any size and split to order. The owners of the quarry claim that their slate is the best ever discovered in California, far excelling the roofing slate now being taken out in El Dorado county. The miners say they have a large ledge of fine-grain stone which will make first-class pencil-slates for use in schools.

THE new Howard-street line of cable cars is a part of the Omnibus Railroad Company's system and runs from Twenty-sixth to the ferries. At Tenth and Howard streets a cable branch runs along Tenth, across Market into Fell, to Franklin, to Oak, to Stanyan, to Waller, passing the Haight-street Base-ball grounds. Another branch begins at Post and Montgomery and finds its way out to Waller. A horse-car line will connect between the ferries and Post street. Still another cable branch will begin on Leavenworth and Ellis and will run south on Leavenworth to McAllister, passing in front of the new City Hall and connecting at Polk and Fell streets with the cable from Tenth and Howard to the park.

THE ADELAIDE COPPER MINE.—The work of developing the 100-foot level on the Adelaide copper mine is being rapidly pushed, and with very satisfactory results. The drift south is in 35 feet, and shows good ore all the way. An assay from some soft decomposed sulphurets in the face ran 22 per cent copper and 18 ounces silver. The crosscut west is in 36 feet and still in ore. A drift from this crosscut has been started north along the vein and a crosscut will soon be started east toward the hanging-wall. Work on the shaft will be resumed, and it will be sunk another hundred feet when the 200-foot level will be opened up.—*Winnemucca Silver State.*

FOR THE ADVANCEMENT OF ASTRONOMY.—Among the newly incorporated enterprises is the Astronomical Society of the Pacific, which has for its objects the study and advancement of the science of astronomy and the fitting out of expeditions for the purpose of observing astronomical phenomena in the United States or in foreign countries. There is no capital stock. The directors are: Edward S. Holden, E. J. Molera, Chas. Burckhalter, J. M. Shaeberle, Wm. Alvord, W. H. Sowden, W. C. Gibbs, Wm. M. Pierson, Wm. Bœricke, Frank Soule, Jr., and C. Mitchell Grant.

Town-Sites and Auriferous Lands.

In December last L. E P. Lachlan applied to the Federal Land Office in this city (says the Sacramento *Record Union*) for a mineral entry on certain tracts of land in El Dorado county. The application was rejected by Register Hetzel on the following grounds:

First—The conflict of a portion of the tract sought to be entered with the grant to the Central Pacific Railroad Company.

Second—On the ground of conflict of other portions of the tract with mineral patents already issued by the Government.

Third—On the ground of conflict with patents issued by the Government, under the town-site law, to the inhabitants of the town of Greenwood, El Dorado county, on Feb. 3, 1874.

Mineral Claim or Town-Site.

The Register held that the first two grounds of conflict are local and not of general interest. The Commissioner of the General Land Office has sustained the Register in his rejection of the application upon each and every ground, but with reference to the third ground has instructed the local office that, if so demanded by the mineral applicant, a hearing must be ordered to determine whether or not this particular mineral claim was known to exist prior to its occupancy or improvement for residence or business purposes under the town-site title.

The General Land Office further holds that if it be proven after a hearing that the land in conflict was known to be valuable for mineral purposes at or prior to the inception of the town-site entry, or prior to its occupancy and improvement for residence or business purposes under the town-site title, the General Land Office will recommend the Secretary of the Interior that suit be instituted in the name of the United States to declare that portion of the town-site patent proven to have been known to be valuable for mineral purposes void and of no effect. The Commissioner, in his decision, refers to a decision rendered by the Secretary of the Interior on July 9th last, in the case of the Government against Laney.

The Effect of This Decision,

Under certain possible contingencies that may arise, would seem to be very far-reaching and full of importance to towns in the mining sections, many of which are built on ground that in early days was covered by mining claims, and which ground is still known to be valuable for mining purposes. The result of the contest in the Greenwood case will be watched with great interest, as the character of the evidence that will be taken at the hearing ordered by the General Land Office will determine the extent of the danger that threatens other towns located under similar conditions to those of Greenwood.

The Nevada *Herald* predicts a hard winter because the wild geese are herding to the south in great numbers.

Patents and Progress.

Changes Wrought by Inventors.

One need not be very old to have a distinct recollection of his daily life, its conditions and environments, 50 years ago, when the patent system of the United States was in its early infancy. Then the country was almost entirely agricultural, for our grand career in manufactures and the industrial arts was just beginning. It virtually began with the patent system—the creation of the Patent Office—and it has actually kept pace with the development of that system, so that this magnificent progress stands as the indisputable result of the system. In other words, we owe our splendid achievements in manufactures and the arts to the stimulus that the patent laws have given to invention.

Fifty years ago most of the people of the United States were clothed from the products of the domestic spinning-wheel and hand-loom. The itinerant shoemaker went from house to house, setting up his bench and plying his vocation in the farmers' kitchens. There were no planing-mills; no shops for the manufacture of doors, sashes and blinds. All the work of the builder, including carpenters' and joiners' work, was done by hand. The carpenter, if a good one, got a dollar a day. Coal was consumed but by few families even in the large cities, and by nobody in the smaller towns. The tailors, like the shoemakers, came to the house and made into clothing the cloth woven by the mother and daughters, with a little help from the fulling-mill that was generally near the grist-mill of the neighborhood. The railroad and the telegraph had not yet added their powers to the forces of civilization. This year, 1889, is no more like 1839 than the hand-loom is like a cotton factory. "Better 50 years of Europe than a cycle of Cathay." Better one year of the life that is lived under the new conditions than any number of years of the hard existence that was drudged out under the old conditions. It is only the hopelessly pessimistic soul, and the constitutional and incurable grumbler, who does not recognize the blessings that have come with the march of invention. For all those, let it be borne in mind, we are indebted to the system that has fostered invention, and secured to inventors the right to enjoy the products of their own brains and hands. —*Inventive Age.*

What the miners of the United States want is a square location law with plain statements. Give us a law which shall plainly define a miner's rights, confine him to his side lines and end lines and avoid litigation.—*Los Angeles Miner and Artisan.*

Engineer John Heath has been in the service of the Northwestern railroad nearly 30 years, during which time he made 93,658 miles as fireman and 905,117 miles as engineer without an accident. It is a notable record.

The Hensley group of copper mines at Washington Camp, Pima county, Arizona, has been sold to the Westinghouse Manufacturing Company of Pittsburg, Pennsylvania. They have been bought, not for speculation, but to produce copper to be used in the manufacture of engines and other machinery. The price at which the mines are sold is said to be $100,000. The several claims are being patented and extensive works are to be erected to reduce the ore.

A telegram has been received at San Diego from the officers of the San Diego Land and Town Co., in Boston, owners of the Sweetwater dam, directing the floodgates to be opened, and to let 5,000,000,000 gallons of water run to waste in the bay. The object of this order is to remove the water from the lands of Neale and others, who recently secured a verdict in the Superior Court of that county, awarding them $122,675 damages for about 350 acres of land covered by water behind the dam. The company claims that the award was excessive, and rather than pay it, will restore the land to its former condition.

At Klamath City, says the Yreka *Journal*, the Klamath River Lumber and Improvement Co. employes have made great progress lately in the construction of their mill, the frame of which is now nearly completed, and the machinery is now being shipped at the East. They have also erected six new houses on the principal business avenue of the new town, called Commercial street. There are about 600,000 feet of lumber now on the ground, for construction of the company's buildings, with 400,000 more to arrive as fast as the Sisson Lumber Co. can fill the order, and it is expected the extensive mill will be in operation by the 1st of December next.

The sash, door, blind and molding mills of the interior of California send some of their product to San Francisco. In some cases this comprises a large proportion. The remainder goes into the immediate neighborhood of the mill. This is especially the case where the mills are located in the large interior cities and towns. The San Francisco mills sell most of their product for home consumption, and much of it is consumed in this city. They also supply interior points from San Diego to Siskiyou. Shipments are also made inland to points outside of State boundaries. There is also some export trade with foreign countries. Australia is probably the best country in this line. Last year over 34,000 doors were sent hence to the colonies of a value of $59,800. There were also door stock and moldings for the same market to the value of about $20,000. Mexico takes about 10 per cent of what Australia buys in this line here. The various islands of the Pacific are customers of the same kind, but on greatly reduced lines. But it is upon domestic rather than foreign consumers that our manufacturers rely for custom and an extension of their business. Fortunately the home field is steadily enlarging. From a few hundred buildings per annum, San Francisco alone is now erecting upward of a thousand, and every building furnishes a demand for doors, sashes, blinds, etc.

San Buenaventura.

San Buenaventura, the county seat of Ventura county, is one of those pleasantly located southern towns which is profiting by the impulse imparted to them by railroad connection, increase of population and the enhancement of real estate values. Like all of the old California Mission towns, the beauty of its location, the salubrity of its climate, and the agricultural resources of the surrounding country were the natural inducements which tempted the shrewd old Padres to establish a station here. Like some others of these old Missions, also, these natural advantages were allowed to slumber for nearly a century before they were availed of by the new and more energetic race which has come in and possessed the land.

It is now a thriving city of thirty-five hundred people, with wide, shady streets and avenues, laid off at right angles, with public and private schools, churches of all denominations, daily and weekly newspapers, free library and reading-room, large and convenient hotels, stores where every description of merchandise can be procured, and all the accessories of a thriving, well-furnished California town.



A PARTIAL VIEW OF SAN BUENAVENTURA, CAL.—A CITY BY THE SEA.

The town is built at the mouth of and on the east bank of the Ventura river, is on the coast line of the Southern Pacific railroad, about 65 miles northeast from Los Angeles, and about 25 miles southeast from Santa Barbara, and being situate on the coast, with tolerably deep-water facilities, enjoys the advantages of competition between railroad and marine transportation. In addition to all this, San Buenaventura has a large and fertile back country tributary to it, and being thus happily located, is secure in present prosperity and future success.

A New four-masted schooner built by Hall Bros. at Port Blakely is called the Golden Shore. She is owned by J. J. Smith and others. She is 178 feet on the keel and 200 feet in length over all, 38.6 feet beam and 14.2 feet in depth of hold, and is the largest vessel ever built by Hall Brothers. Her masts are each 100 feet high, being 89 feet above the deck; the top masts are 60 feet higher. Her booms are 39½ feet long, and the gaffs are 38 feet long. The Golden Shore has a carrying capacity of 1,000,000 feet of lumber, having come down from Port Blakely on her first trip with 960,000 feet of lumber. Forward there is a donkey engine and a steam pump, used in loading and discharging and to facilitate the weighing of the anchor.

Richard Jones, agent of a colony of Welsh people, has bought a tract of 800 acres near Fulton, Sonoma county. The land will be divided into 30-acre tracts.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

AMADOR GOLD MINE.—*Ledger*, Aug. 31: There are about 80 men at work on this mine now. The Co. are putting in two-inch pipe all around and inside the mill for use in case of fire. The mill reservoir will be finished next week. The new hoisting works come up to expectations, and are a great improvement over the old hoist. Good progress is being made in the drifts and crosscuts in the lower levels; the west crosscut at the 550 level is now in about 275 feet and advancing at the rate of 30 feet a week. The north drift at the same level is in 165 feet. Here only 15 to 20 feet a week is made as the drift is on one of the ledges all the way, and quartz does not break as well as slate. This drift and crosscut are being driven to connect with the north and west shafts respectively at the 550 level, so as to afford good ventilation, and at the same time increase the available supply of ore. The richest gold specimens yet obtained from the Reed and Askey mine were taken out this week. They will be sent to the State Fair.

VOLCANO.—Cor. Amador *Ledger*, Aug. 31: The Volcano Tunnel Co. has bonded its mine for $180,000 to an English company, and there is a chance for all the property adjoining to be sold. Work commenced at the Bob Powers claim on Monday last. They are going to put in large reservoirs for the purpose of catching water in the winter.

SUTTER CREEK.—On Monday the hoisting works on the old McAdams mine, now owned by S. D. R. Stewart, were destroyed by fire. Before anyone had time to get to the spot the building was almost entirely demolished. Fortunately the machinery had all been moved away.

DRYTOWN.—A full force of carpenters and millwrights are at work on the new 30-stamp mill at the Cosmopolitan.

Butte.

LOVELOCK.—Oroville *Register*, Aug. 29: At the Carr mine there are six or eight men drifting and getting ready for washing the gravel this coming winter. Right opposite this mine a Shasta company have opened what is known as the Mammoth Silver Ledge. The quartz assays high in silver but the free gold that has been found in it will pay for working. In the Hough ledge they are at work and getting out some rich rock. This is thought to be a pocket ledge but it turns out some fine quartz. Between the West Branch and Kimshew the Perkins & Gallagher ledge promises finely and about 60 tons of rock are on the dump. The owners talk of putting up a mill this fall. They have a tunnel 250 feet long and have tapped the ledge at a depth of 105 feet. We hear rumors of a fine prospect of gravel on the head of Chipp's Creek by Patterson & Co. The Martha Washington mine at Kimshew, owned by Snow & Kendall, has been leased for a year. The Josephine mine has been leased for four years to Waldow & Co. Preparations are being made for working both mines this winter. The parties who have leased the mines are getting out timbers and lumber and making other preparations for the coming of the rainy season. M. Doon has the contract for furnishing the lumber to repair the flumes on the Hendricks ditch, while Boxall & Yonkers have the contract for fixing the ditch itself. The water will be brought down to the mine owned by George Perry near the mouth of the Little West Branch. Messrs. Russel, Smith, McFaddyn, Jurgenson and others are opening a mine on Big Butte Creek near the mouth of the American Ravine. They will flume Big Butte and work the bed of the stream. This promises well and when the bed rock is reached it is thought it will prove very rich. Years ago ground worked here by Fox Brothers paid finely and it is believed this mine will pay as well.

Calaveras.

AROUND ANGELS.—*Echo*, Aug. 31: Everything is being got in readiness at the Gold Cliff mine preparatory to resuming work on an extensive scale. The Bradley mine, owned by Ike Bradley & Co., and situated near Smith's Flat, has been bonded to C. R. Beal & Co. for the sum of $1000. The company will proceed at once to develop the mine. Nearly every morning since the mines have reduced their working force, owing to the scarcity of water, the stages leaving Angels have been loaded down with men in search of other fields for employment. The Utica mine is soon to have a new engine and boiler, to furnish motive-power for the mill whenever the water supply for that purpose gives out. The furnace is now being built, and the machinery will arrive in a few days.

El Dorado.

CEMENT GRAVEL.—Placerville *Observer*, Sept. 3: The Chili Ravine Cement Gravel Min. Com. have commenced a tunnel on the south side of their claim near Weaver creek. The mill stands in Chili Ravine from which a long tunnel runs easterly. From this tunnel they have recently run South, striking into a channel of rich cement gravel which is too deep to admit of its being worked from the tunnel on the Chili Ravine side. They therefore find it necessary to run in from the Weaver creek side of the divide in order to tap the channel deep enough to conveniently extract the cement gravel. The discovery of this channel will greatly enhance the value of this property. The main East tunnel at the Equator mine, is being driven ahead. Three parallel veins have been run through on the line of this tunnel, one of which is over 20 feet in width, the ore prospecting over $7 per ton. It is the intention of Supt. Burdick to commence drifting North on this ledge. It promises to open into an immense ore chute which will furnish a supply of ore sufficient to keep a 40-stamp mill running for many years without having to sink below the level of the tunnel. Mr. B. G. Parlow is now sinking a shaft on the Gentle Annie mine at Poverty Point, and is down about 40 feet. At this depth very fine ore is being found, showing considerable free gold, galena and iron pyrites. The width of the vein is not known, as the shaft does not take it all in. It is certainly a large vein of ore, and promises to make a good mine. The mill at the Rogers mine at Smith's Flat has been closed for a while on account of water. Abe Landecker, time-keeper at the Chili Ravine mine, is highly elated with the showing now made at the Chili. They are arranging to put steel rails in the South tunnel and open up the lower channel in first-class style. Preparations are being made for active operations at the Greenstone mine. Work on this mine was suspended for a few days while waiting for machinery and steel rails, a carload of which will arrive this week. The outlook at the Greenstone is decidedly encouraging. We hear very flattering accounts from the Reeg mine. Messrs. Holland & Bradley have recently started one of the National rocker mills on that mine and the ore is yielding beyond expectation.

Inyo.

CERRO GORDO.—Inyo *Index*, Aug. 28: Supt. Farrington of the Union mines is expected back in a few days. A carload of mining timbers, 8x10, is side-tracked at Keeler. Report has it that what is known as the "new shaft" will be reopened and timbered anew, and that the first extensive mining will be done on the 700-foot level. The crew now at work have kept right along where Boland & Gorman left off, and already have considerable good ore on the dump.

Mono.

THE LAKEVIEW TUNNEL.—Homer *Mining Index*, Aug. 31: The lower tunnel of the Lakeview is progressing favorably. The ledge is presumed to be about 25 feet distant. This intervening space will soon be passed through, and in a few days our anxious curiosity will be satisfied. If the ore found below is as good as that obtained above, it will be safe to call the Lakeview a first-class mine. In fact, it is generally believed to be one of the most valuable properties in the district, and if it were in the hands of live persons, it would be shipping bullion right along, as it should have been doing for ten years past. Harry Trevathen is working on the Sheboygan and getting a considerable quantity of $30 ore, while Burns of the Corinthian has been enjoying himself in Bodie for quite a spell. He is probably "getting a good ready on." Three miners will be put to work next week on the Real Top Sawyer, recently located on Mt. Gilcrest. It is said that there is plenty of good ore in sight. It is certain that there is a royal chance for a dump. Most of the waste will light on top of the Lake Canyon mill. The Josie Green folks are talking of resuming work on their promising little mine. There is more money in it than in developing the vegetable resources of Mono county with a toothless rake or in pumping grass-juice out of a reluctant cow. Jasper Parrett will start up his mill again next week, having sufficient ore on hand to run until cold weather compels him to quit. Rich concentrates from May Lundy ore are being packed down from the upper canyon and stored at the old mill for future reference. Bullion goes out of the camp regularly from various sources and by different channels, and little noise is made about it, though the aggregate is sufficient to attract attention elsewhere. Wm. Ray's claim, the Silver Crown, at Mount Gibbs, at the depth of 25 feet, shows a large ledge of fine ore. A long hole in that hill would disclose something worth seeing. The Powbattan mine is showing up well. The owners, realizing that they have a good thing, are industriously developing it. Tom Williams is hauling 100 tons of hay to the Mono mill.

RARE ADVANTAGES.—Homer *Mining Index*, Aug. 31: Homer District has advantages that few other mining regions possess. The mines may be worked to the depth of more than 3,000 feet, and neither hoisting nor pumping machinery will be required. No other section affords such facilities for deep tunneling. The Erie tunnel, when completed, will be 4,500 feet long, and intersect the ore channel in Prospect Mountain 3,000 feet below the croppings. Another 1,000 feet might have been added to this depth by starting the tunnel lower down the hill. Unlimited water-power may be obtained for driving machinery in either of these canyons; so, if mining can be done cheaply anywhere else, it can be done cheaper here.

THE GOLDEN CROWN.—"The vein in the Golden Crown is one of the prettiest things I ever saw"—so an old miner said the other day, after inspecting the ground exposed by the tunnel, which is about 200 feet. It is, in truth, a very promising mine; and every blast and stroke of the pick improves its appearance. The vein is about 20 feet wide, and the ore streak six to eight, all giving high assays, while eight or ten inches of it is the richest black metal, worth from $500 to thousands of dollars per ton. It is known to a certainty that this mine will be handled next year in a business-like manner, and it is more than probable that reduction works will be erected on an eligible site adjacent, where wood and water are abundant. The company owning the Crown and adjoining property has expended about $20,000 in the work of development, and has plenty left for further operations.

A FREE-GOLD PROSPECT.—There is a ledge of gold-bearing quartz of unknown width on the summit of Mount Gibbs, nearly 12,000 feet above the sea, and about 3,000 feet higher than Ella Bloss and Golden Crown, running northwest and southeast, with a slate country on the west and porphyry on the east. It appears to be an enormous contact vein. The slopes of the hill are covered with float quartz, some of the blocks weighing many tons, and from their shape and size it is inferred that the ledge is of great width. It is about a mile east of the silver belt, and looks well enough to induce a prospector to expend considerable work upon it.

THE MONO-BULLION.—Fred. Schwartz has, without doubt, got a good mine in the Mono-Bullion. The vein holds a steady width of about ten inches, and being good ground to work the ore is easily extracted. He will keep on during the winter, and when spring comes he will not only have a good lot of ore on hand, sufficient to afford him more than wages for his labor, but he will own a piece of valuable property.

Nevada.

BELOW THE BALTIC.—*Transcript*, Sept. 1: The new mill at the Starr mine, a mile and a half in a southerly direction from the Baltic mine, has been put in operation, and is crushing some good-looking ore. Mr. Campbell is superintending this property. Development work is being done on the Boston quartz claim, situated above the Bloomfield ditch and about a mile from the Baltic. As Sheriff Dunster was passing there Friday, he noticed that the blacksmith shop was in danger of destruction from a fire that had started on the woodwork around the forge and was spreading rapidly. He shouted to the men working in the tunnel, but getting no response turned to and extinguished the flames. After he had done so one of the miners came out and noting the situation thanked the sheriff heartily for saving the property.

CRUSHING.—*Tidings*, Aug. 31: A crushing from the Gladstone mine, near Bonivert's place and owned by J. J. Ryan and others, paid $60 a ton. Good Ore. Messrs. Brown and Spaulding are sinking from the tunnel level on the shoot of ore in the extension of the old banner, and find the ledge widening and the rock improving in quality as they sink.

THE MANZANITA.—*Transcript*, Aug. 30: Messrs. Allan & Wheeler have run the new tunnel of the Manzanita drift mine 328 feet since the 8th of last July, and they are now getting near gravel, judging from the flow of water encountered. They expect to be in pay dirt within two or three weeks. It will probably take from 700 to 800 feet of tunnel to reach the channel's center.

Plumas.

THE BUNKER HILL CON.—*National*, Aug. 24: This mine is now coming into great prominence, and is pronounced by experts to be one of the finest gravel mines in the State. It is situated at the head of Hopkins creek, about 26 miles southeast of Quincy, and is near the Sierra county line, and adjoins the celebrated North America mine. It has been worked more or less since 1857, but through bad management, never paid well; but since the property has been under the present manager, it has yielded fine returns. It is owned by a corporation, the stockholders being mostly the miners. William Metcalf of Nelson Point is superintendent, and the success of the mine and the fine condition it is in is owing chiefly to his careful management. The mine has paid so well for the last five or six months that a large debt was paid off and everything is easy to run right along. The main tunnel is in about 1300 feet, and a magnificent body of gravel has been struck; this gravel is the same deposit as the North America, and this itself bespeaks a fine mine. The appliances for working are all first-class. Twenty white men are employed now—not a Chinaman on the place. The superintendent says that they have the finest gravel mine in the country, and we hope they have.

THE MEGOWN MINE.—Greenville *Bulletin*, Aug. 28: This property is deservedly attracting attention in Plumas. It is situated six miles from Spanish Ranch toward Rich Bar, about one mile north of the old Mountain house. The discovery was made many years ago, but little work in developing it was done until within the past two years. It is what is called a contact ledge, situated beside a serpentine belt, and consists of a quartz vein in porphyry, and much of it is of a decomposed character. It is about 14 feet wide. The vein has been tapped at a depth of 100 feet. By a 700-foot tunnel, 500 foot-backs can be secured on the ledge, which stands at an angle of about 45 degrees. It may be called a rich mine. Three men rocked and panned out $172 in one day, and during four weeks they averaged $50 per day. The vein has been developed 300 feet in length. When it is known that at a depth of 100 feet the ore pays equally as well as the figures named above, the value of this property may be roughly estimated. It is owned by Mr. Megown, who has been struggling along several years in his efforts to prospect the mine in which he had so much confidence. No mill has yet been erected on the property. During six months of the year there is sufficient water-power at command to run a suitable mill.

Shasta.

OLD DIGGINGS DISTRICT.—*Free Press*, Aug. 29: Mr. Reno, a mining man from Salt Lake City, was inspecting the mines of the Old Diggings during the past week in company with Andy Fife. Mr. Morton also had a visitor from below whom he was showing around. The Old Diggings district is attracting its share of attention from mining men, while the whole county is enjoying a modest though substantial boom.

Sierra.

OXFORD.—*Mountain Messenger*, Aug. 31: The quartz ledge at the Oxford has widened to nearly four feet and the rock is exceptionally fine looking. The chimney which they have struck contained some very rich rock near the surface.

GOLD BLUFF.—The Gold Bluff Mine is about to begin raising water from the lower levels by means of 63-gallon tanks. The work of laying the pipe from the Costa ditch is expected to be completed by the end of this week. The depth to which sinking was carried by hand was about 100 feet, at which point not much if more than two inches of water was had to contend with. It is confidently believed that the present machinery will enable Mr. Van Slyke to carry his works down many hundred feet without difficulty.

Trinity.

EAST FORK.—*Journal*, Aug. 31: Jas. E. Given, from East Fork, informs us that times are lively in that camp. There are about 150 men in the camp and vicinity, and a good deal of work is being done. The Enterprise Co. will have their new stamp mill in running order in two weeks more. It is reported that two new stamp mills will be taken into the camp this fall, one to be put on the North Star mine and the other on the Yellowstone property. A good deal of development work is being done on the above-named properties. Day & Co. on the Ozark are taking out good ore, running tunnels and crushing rock. Frank Peterson has been crushing good ore from the Fountain Head. On the whole the outlook for the future of the camp is very bright. Capital has found its way in and mining operations will be conducted on a larger scale than heretofore. By the time the winter rains set in several mills will be crushing ore and a steady outt-put of bullion will add its share to the progress and prosperity of that part of the county.

A NEW MILL.—H. Junkans informs us that the mill for the North Star mine on East Fork will be shipped in about a week and will be erected as soon as possible after it arrives. The work of grading, etc., will be pushed rapidly and the timbers will be on the ground when the mill arrives.

NEVADA.

Washoe District.

UTAH—Virginia *Chronicle*, Aug. 31: On the 600 level the north drift is advanced 520 feet; formation vein porphyry with streaks of quartz, showing value.

CON. CALIFORNIA AND VIRGINIA.—The usual quantity and grade of ore is being extracted from the various openings on the 1400, 1435, 1500, 1600, 1650 and 1950 levels. On the 1600 level continue to extract ore from ground bordering the south drift from the Ophir line on the sill floor. On the 1950 level the incline winze is sunk 99 feet on the slope below the track floor of this level and continues in ore of fair quality. During the week 1090 tons and 820 pounds of ore were shipped to the Morgan mill and 1762 tons to the California. The average assay value of all the ore worked at these mills during the week, according to battery samples, was $28.05. Shipped during the week bullion valued at $40,912.38 to the Carson Mint and $33,284.44 to San Francisco. Now on hand in the assay office about $28,000.

OCCIDENTAL CON.—On the 300 level a north drift is advanced 69 feet from the upraise, 90 feet on the slope above this level. Formation quartz and porphyry. Extracting ore from the 350, 400 and 450 levels. During the week extracted and milled 348 tons of ore showing an average assay value of $18 per ton. Shipped to Carson Mint, bullion valued at $4670 and have sulphurets on hand valued at $10,000.

BEST & BELCHER.—On the 550 level, the northwest drift is extended 78 feet. Formation soft porphyry, with streaks of quartz. On the 1000 level the northwest drift is extended 217 feet. Formation porphyry, with streaks of quartz showing some value.

GOULD & CURRY.—On the 300 level, the north drift from west crosscut No. 2 is extended 68 feet. Formation clay and porphyry with streaks of quartz. On the 400 level west crosscut No. 1 is extended 268 feet. Formation porphyry.

JUSTICE.—The mill crushed 200 tons of ore during the week, showing a value of $28 86 per ton by battery sample assays. The 490 level southwest drift has developed a 3-foot vein of fair-grade ore, which is being stoped out.

BELCHER.—The 200 level east crosscut is in quartz, assaying from $3 to $5 per ton. The 1200 level south drift is out 305 feet, the face showing quartz. The raise above the 1200 level is in low-grade quartz.

SAVAGE.—Work was retarded in the 300 new west drift on account of a flow of water, which is rapidly diminishing. The north drift from the upraise above the 500 level is still in ore.

UNION CON.—On the 1465 level west crosscut No. 2 from the north lateral drift is advanced 334 feet, from the south line, continuing in porphyry and clay with some water.

SILVER HILL.—The 160 level northwest drift has reached the Justice line. A southeast crosscut from this drift is in quartz. The 260 level northwest drift is in porphyry.

SIERRA NEVADA.—On the 520 level from the shaft station, an east drift is advanced 1200 feet and has passed into a softer porphyry formation with some water.

OPHIR.—On the 1300 level the east drift from the shaft station, to connect with the raise above the 1465 level east drift is up 43 feet, the top in porphyry.

CROWN POINT.—The 700 level south drift is showing quartz. The 800 level south drift is in quartz and the west crosscut in porphyry and quartz.

NORTH OCCIDENTAL.—On the 400 level the north drift is advanced 117 feet. The face continues in hard porphyry and quartz carrying value.

CHOLLAR.—The 750 level west drift is out 440 feet, the face in quartz and porphyry. The 850 level north drift continues in hard porphyry.

CONFIDENCE AND CHALLENGE.—The 500 level joint Imperial west crosscut is in 100 feet, the face continuing in quartz and porphyry.

MEXICAN.—On the 1465 level the north drift from the west crosscut No. 1 is advanced 293 feet continuing in porphyry and quartz.

OVERMAN.—Top of the upraise north of winze in quartz and porphyry. Upraise above southwest drift in same material.

POTOSI.—The 750 level south drift is still striping quartz, giving low assays. The 550 level east crosscut is in porphyry.

HALE AND NORCROSS.—Crosscutting the mineral belt stripped by the 300 level north drift will begin next week.

ALTA.—Mill in full operation and stopes on the 825 and 925 levels yielding the usual quantity and grade of ore.

ALPHA.—The 382 level west crosscut is in low-grade quartz. The shaft is being sunk below the 500 level.

YELLOW JACKET.—Continue shipping 50 tons of ore daily. The 500 level west drift is out 550 feet.

IMPERIAL.—The 300 level north drift is out 420 feet from the south line, the face in quartz.

NEW YORK CON.—The raise above the 800 level west crosscut continues in quartz giving fair assays.

BULLION.—Operations temporarily suspended on the 760 level.

SEG. BELCHER.—Crosscuttting east of the 1100 level.

Como District.

ABANDONED.—Walker Lake *Bulletin*, Aug. 28: News comes from Como that everything is again shut down and the camp abandoned. Como has had many hard struggles for life.

Cortez District.

TRANSPORTING ORE.—Eureka *Sentinel*, Aug. 31: At Cortez men have begun building a track from the mine to the mill, a distance of half a mile. The cars loaded with ore will be run by gravitation to the mill, and the empty ones will be hauled back by horses.

Eureka District.

AN OBSTACLE.—Eureka *Sentinel*, Aug. 31: We learn, upon good authority, that the "timber suits" are a serious obstacle to the drainage of our Ruby Hill mines at the present time and prospecting below the water line. Nothing can be prudently done until those suits are out of the way. Blackmailing litigation has been one of the chief drawbacks to the prosperity of all our mining camps. Yet there are always men to be found in every camp who encourage it.

Garfield District.

SHUT DOWN.—Walker Lake *Bulletin*, Aug. 28: The Garfield mines are shut down, and the mill is now working on the final cleanup. We have heard no particulars as to whether the stoppage is permanent or not. The checks of the company are being protested, but Manager Hooper says all claims will be paid in full.

Wild Rose District.

A RICH STRIKE.—*Silver State*, Sept. 3: The welcome news comes from Spring City, well

authenticated, that a rich and apparently large body of ore was cut in Tunnel No. 1 of the Paradise Valley mine last Saturday night. No. 1 is the level which produced the richest body of ore ever found in the mines.

Tuscarora District.

BELLE ISLE, *Times-Review*, Aug. 30: North drift from the west crosscut, 250-foot level, extended 14 feet. Face looks favorable.

COMMONWEALTH.—North drift, 100-foot level, has been advanced eight feet. A crosscut east has been started near the face, to intersect No. 14 upraise. This crosscut is developing fine ore. As soon as the crosscut is in a few feet, the north drift will be driven on north, to open up the ore that is still in the face of drift. South of shaft, east crosscut, has been started. At the 300 foot level station have cut out and started a gangway, which is in four feet. Mill has been closed down and bullion from cleanup shipped $26,292.75.

DEL MONTE.—North drift, 225-foot level, extended 11 feet; face looks favorable. Joint crosscut, same level, extended 16 feet in vein. Main north drift, 100-foot level, extended seven feet. No. 1 crosscut has reached the hanging wall.

NAVAJO.—The crosscut from the end of the south drift, 350-feet level, extended 16 feet. No. 1 upraise, south end, same level, extended 11 feet; total height, 100 feet—continues to yield some good ore.

NORTH COMMONWEALTH.—Joint crosscut east, 225-foot level, extended 16 feet, still in vein. Main south drift, 100-foot level, extended 16 feet; the whole face of the drift in low-grade ore.

GRAND PRIZE.—Water lowered 20 feet during the past week; everything running smoothly. Concentrator was started up last Tuesday, running steadily and doing good work.

NORTH BELLE ISLE.—The shaft has been sunk and timbered 15 feet. The water has decreased to the normal quantity, and everything is running nicely.

ALASKA.

YUKON MINERS RETURNING.—Alaska *Free Press*, Aug. 20: On Tuesday last a party of four men, consisting of Harry Spencer, J. J. Kelliher, Daniel Dowd and B. H. Ryan arrived here from the Yukon. This party started from here for the gold-fields about the middle of last May. The party prospected along the banks of the Yukon and also on Lewis river, but failed to find pay. They floated down to Forty Mile and ascended that stream as high up as Moose creek, and on the latter stream found comparatively good pay, but not sufficient to work with a rocker. The gentlemen stated that there were not a great number of men mining on Forty Mile this season, as the best pay along that stream had been worked out; but, however, some gold was being taken out, but thought the largest amount taken out by any one man would not exceed $2,000. High waters had prevailed, and had prevented miners from working the low bars, which were the richest, and many of the high bars also. A number of wheels, ditches and sluices had been washed out. In their journey they had met a party who had just returned from a prospecting trip of 200 miles up Pelley river, and they reported finding nothing that would justify working. About 35 miners were at work on Stewart river, and as none of them had come down, nothing definite was known as to what they were taking out, but the general supposition was that they were doing well. Sixty Mile creek was attracting some attention; and if the men at work there were doing well, others would go there before the season closed. All the miners were of the opinion that something big had been struck on the Tananah, the main artery of the Yukon from the west. Frank Densmore and party had ascended that stream about two years ago, and it was thought that their prolonged absence could only be the result of having found rich diggings, which they were working.

CLOSED DOWN.—The Bear's Nest has closed down work for the present on the mill and lower tunnel, but another tunnel has been started above the old one, and is now being rapidly driven into the mountain. Many wild rumors are afloat and much speculation is just now being indulged it as to the whyness of the wheretore of all this closing down of work; but as none outside of the company itself knows, we assert that no credit whatever should be given to any of the different rumors that are now floating around. The Greek boys came down from Berner's Bay this week, and report development work progressing rapidly on the Uncle Sam and Golden Crown locations. A tunnel is being run on the Uncle Sam and a shaft sunk on the Golden Crown. During this week, from the latter vein, some very fine gold ore was taken out, and both veins increase in width and richness very perceptibly as depth is gained. Other development work, on various claims in that district, is also being pushed rapidly ahead. About 100 men, mostly workmen at the Bear's Nest, left Alaska on the down-going Elder.

SILVER.—While at Douglas City this week, we learned that a very rich silver strike had been made about 125 miles northwesterly from Juneau by D. McClellan, Harry Hare and M. Campbell. One assay certificate, made on a sample of the ore by T. J. Sunny, which was submitted to our inspection, gave the handsome returns of 2,517 ounces of silver per ton; and we were informed that other assays had given from $2,000 up to high as $3,000 per ton. The ore is a chloride in character, and lies in a lime formation. This is the first ore of this character that has been found in Alaska, and now that it is known that such classes of ore exist in the extensive limestone belt to the northwest of Juneau it will lead many prospectors in that direction, and undoubtedly cause many other valuable discoveries to be made. Preparation is being made, we understand, to enlarge the Treadwell Chlorination works. Tons of sulphurets have accummulated beyond what they were able to handle, and it is necessary to enlarge their capacity to keep up with the supply from the stamp-mill.

ARIZONA.

MOHAVE NOTES. — *Miner*, Aug. 31: Henry Schaeffer shipped a carload of ore from Hackberry this week. Frank L. Smith shipped to the Rio Grande smelter four carloads of ore, and he expects to ship that many more next week. The leesees of the Crescent mine are well satisfied with the outlook. They have an eight-inch streak of pay ore, and they expect to take out several thousand dollars during the next few months. Adna Lamson, who has a lease on the Howell end of the Prince George mine, has some fine ore in sight. Col. Beattie, from the Golden Gate mine, informs us that the Monarch Co. does not intend to stop work on the Golden Gate mine, but it will be continued until the company is satisfied that there is nothing in the ledge, or ore in milling quantities is found.

COLORADO.

MAROON GULCH.—Elk Mountain *Pilot*, Aug. 29: Riding over Maroon pass to Aspen a few days ago, we were surprised to find so much mining going on up and down Maroon gulch from Aspen clear up to the divide. All along the entire distance we could hear shots on either side, and at the Sunset mine, about 12 miles this side of Aspen, quite a force of men were at work sacking the high-grade ore, and the low-grade ore was being jigged successfully. All this change has come about within the past year, and another year will make even greater changes. Charley Heusner is about making a sale of his Maroon basin property to Aspen parties. Lew Waite claims this locality will some day be as famous as Aspen mountain, as the contact cuts through lime, and in many other respects the formation is similar. Many new locations have been made. The Jenny Lind mine above Gothic is one of the coming producers for this country. It is owned by J. O. Jordan of Gothic. Work has commenced on the Crown mine, situated on Crystal mountain; it is being worked under bond and lease by some Aspen parties. There is good ore in sight to commence shipping at once. Report comes to town that Oscar Rankin has developed a fine body of ore in the Wyoming lode, situated on Baldy mountain, and belonging to a Cincinnati party. The neighborhood of the Iron Swamp, between here and Irwin, is still attracting some attention, as the mining force is being recruited constantly from various localities. The hose has arrived for the Washington gulch placer, and work will be resumed at once.

NOTES.—Georgetown *Courier*, Aug. 20: The Glendower is turning out a little very high-grade ore. Sherman & Co. are shipping good ore from the Fletcher. The Rogers is turning out ore that mills from 200 to 300 ozs. Sheetz & Co. are shipping occasionally from the Polar Star. Several parties are developing prospects about the Stevens mine. The Montreal is turning out some very good ore. McGran & Rubado have taken a lease on the Baker and commenced a new adit lower down the mountain. The Flagstaff shaft and levels have been almost entirely cleaned out, and work will probably be commenced at stoping on ore between the 50 and 70 levels. The Pelican-Dives are employing sixteen men, and all are in ore and making from two to six dollars a day. It is thought that the new company will commence development work soon.

DAKOTA.

KEYSONE WORKS.—Deadwood *Pioneer*, Aug. 30: As large a force as can be worked to advantage is now engaged setting up rolls recently purchased from the Welcome Company. Progress is rapid enough to be satisfactory to those most interested, who state the work will be completed in time for the plant to resume operations next Wednesday.

IRON HILL. — Furnaces are now undergoing necessary changes before pyritic or dry smelting begins. It is anticipated everything will be in readiness therefor in ten days or two weeks.

AFFAIRS AT GALENA.—Deadwood *Pioneer*, Aug. 28: Galena is to-day one of the busiest mining camps in the Hills. There isn't one man in the place, caring to work, who has reasons to remain idle a day. Several mines, including Sitting Bull, Ontario, Merritt, and Cora, are shipping ore and making money.

IDAHO.

YREKA DISTRICT. — Wardner *News*, Aug. 24: The opinion of all mining men familiar with the formation of this district place the mines surrounding Wardner ahead of all others. Ore is found in immense bodies, large quantities being of very high grade. It is now an established fact that the Emma and Last Chance mines are destined to become a property of great proportions. The ore body in the Last Chance going west still continues, being now nearly 200 feet long, and at place where crosscut, 34 feet wide. The east ore chute still continues, but is more broken up, being a good grade of concentrating ore. The drift is now 115 feet long, no crosscuts have as yet been run there. The west ore body has been struck in the upper tunnel in drifting 100 feet west from main upper tunnel which is 130 feet, vertical above the lower level.

SEVERAL DISTRICTS.—Idaho *Statesman*, Aug. 28: The news from the surrounding mining camps was never so encouraging as at present. There seems to be a simultaneous improvement all along the line and all around the circle. To begin with Silver City, both the Poor Man and the Oro Fino mines are in excellent ore, which is being taken out in large quantities and crushed. On Monday, two bars of about equal value were brought here from the Oro Fino, which were reshipped yesterday (Tuesday). The aggregate value of the two bars was $9,600, nearly 90 per cent of which was gold. These two old lodes are giving a good account of themselves, and may be confidently relied on to do better in the near future. Other mines in the Silver City district and in neighboring camps are making splendid showings, both in the value of the ore crushed at home and that sent abroad, but for sufficient reasons, the owners are reticent as to details. As a most convincing proof of the brightening of the mining outlook and of the belief of miners in the permanent richness of the camp, it is noted that the old town of Silver City seems to have taken a new lease of life. At Rocky Bar in Elmore county, the old reliable Ida Elmore, recently known as the Alturas Limited, is again turning out the golden bricks at a rate surpassing all its former achievements. Other mines in the Rocky Bar and Red Warrior districts are making proportionately good showings, both in ore and bullion. At Pine Grove, in the same county, a very rich body of ore has been recently struck in what is known as the Gold Hill lode. A $3000 bar of bullion from this mine was recently received here among some smaller bars from the same camp. The lode being now worked by the Andreas Brothers at Pine Grove shows a fine lot of ore on the dump ready for crushing by the new ten-stamp mill lately completed. In the Boise Basin the prospects are equally encouraging. The Washington shows a three-foot vein of gold ore, specimens from which indicate great richness. The fine mill now completed will commence crushing this rich ore about the 1st of September. From the Elk Horn, in the same county, there is no definite news at present, but the rich lode is known to be there, and the public will have to wait only a few days for cheering accounts from this and other mines in Boise county. The dearth of water in the Boise Basin this year has caused the placer mining interests to languish, but there has been compensation in the many promising quartz discoveries made during the drouth.

LOWER CALIFORNIA.

ALAMO.—*Lower Californian*, Aug. 29: David Goldbaum arrived on Saturday from Alamo, where he has been at work on the Encantada mine, on the slope of Mount Tomasa. The Lane mill, which is nearly ready, will run through 100 tons of Encantada ore, most of which is already on the dump. It was learned from Mr. Goldbaum that there is great activity in milling at present. The Thorres mill is working on ore from the Quinota and Tarantula, both paying good returns. The Butler mill is grinding on quartz taken from the A. H. Butler. It is showing up lots of good ore. The machinery for the El Paso Mining Co. has arrived and is being put up. That company has quite a gang of men at work under Supt. Owen. It has let a contract to sink on the Avalina, and will have 1000 tons of ore on the dumps of its four mines before it will start crushing. Between 400 and 500 tons are now ready. In the mines, besides those already mentioned, good work is being done. The owners of the Rainbow have contracted for 100 feet each of shafting and drifting, and with this work completed they will have one of the best developed mines in the district. The vein is from 2½ to 3 feet wide. The Independencia Co. has temporarily stopped work on the Asbestos at a depth of 56 feet on account of foul air. A patent blower has been sent for and work will soon be resumed. Mr. Goldbaum reported new finds to the northwest of Alamo, about 25 miles, where Albert Haas has denounced several "vetas con pintas de oro." Specimens of the new ore found six miles from Alamo have been submitted to the assayer. It is thought the rock runs high in silver. The formation is the same as at Alamo.

MONTANA.

NEW MINING DISTRICT. — Helena *Independent*, Aug. 27: The statement that the mineral-bearing lands of Montana have scarcely been scratched is becoming more evident from day to day. Almost every 24 hours an announcement has been made of some new strike. It is now stated that J. W. Allen a miner and prospector, late of Breckenridge, Colorado, has struck it rich. This miner arrived in Montana only a short time ago and seems to have attained his most sanguine hopes in a discovery of quartz. Mr. Allen is now a resident of Helena. After visiting a number of districts Mr. Allen pitched his tent near the head of Carpenter gulch, 4 miles east of Blackfoot City, and three weeks later discovered the Little Daisy lode, which he values at $50,000. The vein is granite formation and is composed of chloride and gray copper ore; the lowest assay gives $56 and the highest $330, silver predominating, the best ore showing $225 assay per ton. The ore contains a strong copper stain. A sample has been received at this office which bears a resemblance to float. There is a degree of importance attached to the strike from the fact that quartz has never been discovered heretofore in the district, which is a comparatively new quartz district and at present is surrounded by placer gold fields.

ORO FINO.—*New Northwest*, Aug. 28: A crosscut is being run north in the tunnel of the Mountain Rat. The ore body shows up well. The tunnel is now in 769 feet and will be pushed toward the heart of the mountain with all possible speed. The Oro Fino Co. has accepted the shaft and bunk-houses recently built on its property under contract, and has advertised for bids for sinking a 200-foot shaft. The Keystone Co., which proposes to develop the George Washington lode on Powderhorn mountain, will soon become an important factor in the camp, as it proposes to get to work immediately. The George Washington is certainly a promising prospect. Ground has been broken for the Champion mill to be erected near Deer Lodge. A force of graders is now hard at work, and a number of carpenters are on the ground getting out the framework. Another and a richer strike than ever was made in the south drift of the Mountain Lion, Sunday. A quantity of ruby and crystallized ruby silver was taken out which is pronounced by all who have examined it, the richest ore ever mined in Montana. Choice specimens will run from $3000 to $7000 and, some say, as high as $10,000 per ton. Of course, this exists in no great quantity as yet, but the fact that it exists at all is "a pretty good hunch."

MICA.—*Inter-Mountain*, Aug. 29: Specimens of mica from the new mica mine near Dillon have been brought to Butte, and are in the possession of Mr. J. J. Cusick at the Clarendon. This mine is situated eight miles southeast of Dillon, and was discovered about three weeks ago. It is the property of Messrs. Pine and Smetly. A shaft has been sunk on the property seven feet, and at that depth the ledge which carries the mica is ten inches in width. Mica plates 8¼ by 18¾ inches have been taken out. Samples of the mica have been sent East, and are pronounced to be of the very finest quality.

NEW MEXICO.

MORA COUNTY.—*La Cronica*, Aug. 21: We here that a contract has been let this week to sink the Overton shaft another 100 feet. While speaking of this we cannot but review the cause of the present mining industry in our county. For years prospecting had been going on; a hole was dug in one place; a shaft was commenced in another place, but no permanent mining was going on until the arrival of Messrs. Davis and Hayes. They came here, looked over the situation, liked the formation and thereupon went to work, with a will, to find a lead. They have stuck to it now for about a year and a half, and though many obstacles were to be overcome, they are still at work—standing it through rough and plain, just as it comes; and Chas. Davis, as the chief rustler, merits to-day the thanks. Mr. Davis has not only been rustling all this time to open up the great Overton mines—for great they can justly be called—but is now out week after week to still further find aid to develop, and, therefore, open up the mineral deposit of this neighborhood. We understand that preparations are making to have a concentrator here, which will be up and doing work before six months.

OREGON.

ROBINSONVILLE DISTRICT. — Cor. Baker City *Democrat*, Aug. 31: The richness and extent of Robinsonville district is attracting mining men from all sections of the country, and it is certainly dererving of investigation. The Phœnix, owned by L. M. Barnett, Cal Berry, D. Shote, and Chas Collier, is one of the most promising mines of the district. The Aerial and Phœnix are developed by tunnel and shaft, there being about 600 feet of the continuous ore body exposed which runs high in both free gold and sulphurets. There being no crosscuts it is difficult to state the width of the vein, but it is safe to say that the ledge is from 2 to 20 feet wide. An arastra has been in successful operation for two seasons on these ores and the average of 175 tons of rock worked by this primitive process was over $50 to the ton saved. The next mine visited was the Worley which shows an immense body of high-grade ore and is second to no mine in Oregon, based on the development already done. There is 400 feet of tunnel run in on this ledge which shows a continuous ore body that averages $40 to the ton in free gold with a large per cent of high-grade sulphurets. The Bonanza and Haggard are the best developed mines in the district, there being over 1000 feet of tunnel and drift on the ledge, the Haggard being an extension of the Bonanza. The company employ about 15 men and are taking out some splendid ore. Although the ledge is small it is rich and pays for its own development.

GOLD.—Jacksonville *Times*, Aug. 28: About 20 men are engaged in the Steamboat mines, and if there is a good season next winter more than the usual amount of gold will be taken out. Reuben creek prospectors report the finding of diggings on the higher bars along the stream that will pay eight to ten dollars per day to the man. Considerable gold will be taken out there the coming winter. The Warren quartz mill on Yreka flats will be started up again soon, to crush quartz taken out at the Witherell ledge on the head of Spring gulch, near the summit of Humbug. Well diggers at Manistee have discovered blue channel gravel under a stratum of sandstone 42 feet below the surface, and miners will prospect it extensively within the next few months. D. J. M. McCoy and others have about completed the building of a wingdam in front of the town of Gold Hill, and are ready to begin work on the gravel in the river bed that has never been mined in that quarter. The low water materially aids the enterprise. The river miners on the Klamath are commencing to hoist pay gravel again, their wingdams and machinery having been repaired and rebuilt since the terrific cloudburst of July 25, which caused such great damage along the river from Cottonwood creek all the way down to Happy Camp. The Portland company, as the Portland Ditch and Hydraulic Gold Mining Company is called, now has about 40 men employed in their mining operations on Grave Creek.

UTAH.

SALE OF ASPHALTUM CLAIMS.—Salt Lake *Tribune*, Sept. 1: The Gilsonite Company, owners of the eight claims, 80 miles north of Price and three miles east of Duchesne, have just sold out for $150,000 to an Eastern company, composed of St. Louis, Akron and Columbus, O., and German parties, who are now in possession. The final details of the transaction were closed up last evening, through C. O. Baxter of St. Louis, agent for the purchasers, and who will act as manager of the property, so it is understood. These claims are in a line, each 600x1500 feet, covering a vein breasting four to six feet, and the gilsonite or asphaltum is claimed to be equal to the purest, if not the purest itself, in the world. The new company will manufacture varnish from the asphaltum besides selling it to other varnish-makers, the crude material being shipped East for manufacture. The selling parties who owned the greater part of the mine are R. C. Chambers, Richard Mackintosh and George Goss of this city. The claims were located in '85 or '86, but as they were found to be on the reservation Congress was induced to set them aside, so that they would not be lost to commerce.

THE WASATCH WORKINGS.—Park *Record*, Aug. 31: A force of 26 men is employed at the Wasatch mine, the bonanza of Blue Ledge district. The new boarding-house, blacksmith shop, etc., are being hurried to completion, and as soon as a new road is made an ore-house will be built. In sinking a winze from the upper-tunnel level to connect with the lower tunnel for air and more advantageous working, a fine vein was encountered at a point about 40 feet down. The winze is down about 50 feet, now leaving a distance of 200 feet to go through. Ore that is worth $100 a ton is exposed in various places in the mine and there is lots of it. As soon as it can be done advantageously, stoping will commence and the ore will be sent to market.

OPERATIONS BY LEASERS.—E. N. Jenkins is working the Creole on a new lease and will soon make a shipment of ore. The Jupiter leasers are getting things in shape for heavier and regular shipments of ore. Flindt & Varcoe have obtained a lease on the old Climax dump and will jig it at day-time, while the night shift will continue working the Apex dump. Jerry Richardson is working a dump belonging to the Crescent Co. on a lease and expects to make quite a shipment of jiggings before long. The leasers of the Uncle Harry, just east of the Woodside, feel much encouraged with the indications for ore soon as was shown by the past week's work. The leasers of the Nevada Northland have their shaft down over 150 feet, and if the continuation of the Woodside vein is not cut in the shaft, it will be soon after drifting commences from the 200 level, because they have the apex. Pat. Feeney, who represents some Salt Lakers, is negotiating with Kelly & Kilkenny for a lease and bond on the Little Belle group, which lies west of the Daly and adjoining the Putnam group.

MECHANICAL PROGRESS.

Scraping Surfaces.

The scraping of surfaces was first introduced by one of the greatest modern improvers of mechanical appliances, Sir Joseph Whitworth, and for tools, engines, slide-valves, planing machine beds, etc., no other system can approach it—in fact it is, when skillfully done, the only true system of perfection, as all practical machinists know. Any portion of work carelessly or slovenly done in scraping would, of course, be worse than if left from the tool of the lathe or planer. Some engineers advocate grinding nearly all the surfaces of large pistons, which 30 years ago were ground after the block and packing, or junk rings, were faced, bored and turned in the lathe. The finish was given by grinding with emery and oil until the surfaces were considered steam-tight. If carefully done, it answered the purpose, but for flat, reciprocating valves, the grinding process would, if one part of the surface were smoother than the other, be likely to wear the surfaces more of both than if the valve had been left as it came from the planer.

This would be increased on large slides, with three or five ports on the cylinder face, as the bars of the ports would not have so much surface as the valve, and by close observation of the wearing by grinding, inequalities would be found on the facings. It would, in fact, be a retrograde step to attempt to go back to the grinding system, except, perhaps, on certain work, such as finishing rings and plugs, gauges or cocks, and then the scraper is necessary to insure a perfect finish. Besides, a scraper leaves a surface that will work with much less friction than any other.

Again, there are many kinds of work that can only be accomplished so as to be perfectly tight by this mode of scraping. For instance, heavy bulk-head valves; how can these be made water-tight by any other process? If there be any other plan, the writer would be glad to know it. As every one knows, a door and seating, weighing one-half a ton or so, after the planing, if not very carefully handled, would spring, and the area of steaming or heat or seat is so disproportionate to the area of pressure, that to attempt to grind would be attended with insuperable difficulties, so that if the job is to be perfect, the scraper is the only tool that can do it. In some shops, however, it is not usual to leave wearing surfaces unscraped. Locomotive slide-valves are sometimes set to work with the tool marks upon them. It would be an interesting question to discuss, as to whether this practice is advantageous or not, for although scraping may be a good thing, it is very expensive, and it is quite possible to have too much of it.—*Exchange.*

American Mechanism.

There is probably no class of manufactures which more forcibly illustrates the superiority of American mechanism than our agricultural implements, hand-tools and utensils and machinery. The *American Exporter*, in speaking of this matter, says: "These (implements, tools, etc.) are of such a high order that they are, thus far, only appreciated in the most advanced countries—countries which pride themselves on the intelligence of their mechanics and the superiority of their own manufactures. The cruder nations, as might have been expected, are not yet fully up to even the courage, which comes from intelligence, of attempting to use our finer machinery and implements. It cannot be expected that man will, at one bound, spring from the implements of his forefathers to the magnificent labor-saving machinery of the United States. The singular result is that the most advanced nation in mechanics in the world, outside of the United States, is by far the largest purchaser of our agricultural machinery and other tools and implements.

"This is sufficient attestation of their superiority. The exports of agricultural implements during the first nine months of the present fiscal year amounted in value to $2,252,000, a gain on the same period of 1888 of over $520,000. The greater portion of this gain occurred in mowers and reapers, although plows, cultivators, etc., show an increase all around. General machinery, not otherwise specified, was exported during the nine months to the value of $5,484,000, an increase of $1,500,000 as compared with the same period of 1888. Saws and tools, most important and significant manufactures, were exported during the nine months to the value of $1,480,000, a gain of $300,000 on 1888. Locomotives were exported to the value of $685,000, a gain of over 50 per cent on 1888. Altogether the exports of iron and steel show a gain during the nine months of $3,000,000 on the same period in 1888."

WHAT A CHILD CAN DO.—No better illustration can be given of the perfect control which modern mechanism has gained over ponderous and heavy machinery than is shown in the following item, which we clip from *Chambers' Journal:* A railway train at 60 miles an hour may be compared to a huge projectile, and subject to the same laws. The momentum is the product of the weight of the train multiplied by the square of the velocity in feet per second; and if we allow a train of 120 tons, traveling at a speed of 60 miles an hour, then the work required to bring it to a standstill would be 14,400 foot-tons exerted through one minute, or nearly 1000 horse-power, which gives some idea of its destructive force if, unhappily, it should come into action, and yet this terrific power is so entirely under command that the strength of a child turning the small handle of the vacuum brake can bring the train to a stand in a few seconds.

Brass and Its Treatment.

The *Industrial World* gives the following useful practical point in the art of making brass: Brass is perhaps the best known and most useful alloy. It is formed by fusing together copper and zinc. Different proportions of these metals produce brasses possessing very marked distinctive properties. The portions of the different ingredients are seldom precisely alike; these depend upon the requirements of various uses for which the alloys are intended. Peculiar qualities of the constituent metals also exercise considerable influence on the results.

Alloys of copper and zinc retain their malleability and ductility when the zinc is not above 33 to 40 per cent of the alloy. When the zinc is in excess of this a crystalline character begins to prevail. An alloy of one copper to two zinc may be crumbled into a mortar when cold.

Yellow brass that files and turns well may consist of copper 4, zinc 1 to 2. A greater portion of zinc makes it harder and less tractable; with less zinc, it is more tenacious and hangs to the file like copper. Yellow brass (copper 2, zinc 1) is hardened by the addition of two or three per cent of tin, or made more malleable by the same proportion of lead.

There would be less diversity in the results of brass castings if what was put into a crucible came out of it. The volatility of some metals, and the varied melting points of others in the same mix, greatly interfere with the uniformity in ordinary work. Zinc sublimes (burns away) at 773 to 800 degrees, while the melting heat of the copper with which it should be intimately mixed in making brass is nearly 1750 degrees. Copper, zinc, tin and lead in varying proportions form alloys, always in definite quantity for a given alloy. The ease with which some of the metals are burned away at comparatively low temperatures, renders it a very easy matter to make several different kinds of metal with the same mix. This very thing occurs, and the great difficulty in getting bearing brasses uniform in quality causes some engineers to babbitt all bearings as the best way to insure uniformity. One lot of castings may be soft and tough, another hard, and so on.

Zinc is added the last thing as the crucible comes out of the furnace, and the mixing of the mass is a matter of uncertainty. If the metal is too hot for the zinc, a large percentage goes off in the form of a greenish cloud of vapor, and the longer stirring goes on the more escapes. The two metals which enter into the composition of brass have an affinity for each other, but they must be brought into intimate contact before they will combine. Some brass founders use precaution to prevent volatilization of the more fusible metals, introducing them under a cover of powdered charcoal on top of the copper.

THE Coronado foundry has secured the contract to supply 500 tons of iron castings to the San Diego Cable-Car Company, and has agreed to deliver the yokes at the rate of 75 per day. Mr. Tonkin, the superintendent of the foundry, is formulating a plan which will be of great benefit to the road, and allow a buggy to pass over the rails without any perceptible jar. He is causing a dummy carriage to be constructed, which will follow the cement men, who will lay the cement flush with the top of the track. The dummy carriage will have a flange three-fourths of an inch in thickness, which will be deep enough to cut the cement away for the wheel of the car, but not deep enough or wide enough for a buggy-wheel to get into.

NEW USE FOR SHEET STEEL.—There is a new use for steel, as displayed at the Paris Exposition, that is attracting the attention of engineers. It is the making of engine and car frames from steel cut by hydraulic pressure from large sheets. An ordinary frame rots in ten years, and it is estimated that this will last a century. It is also said that steel is exhibited which has been made from a low-grade pig iron at a cost of $4 a ton, and that the process of producing aluminum cost but $1 a pound.

THE BIGGEST GIRDERS YET.—In the new addition to the American Museum of Natural History, New York, will be used the largest box or riveted girders ever employed in the construction of a building. These girders were designed to support the floors and partitions, and thus obviate the use of pillars or columns, the object being to give unobstructed floor room for the display of specimens. There are 28 of these girders, measuring about 62 feet in length and weighing 40,000 pounds.

HARDENED STEEL TOOLS.—The *Scientific American* says that hardness on steel tools, almost equal to that of the diamond, is obtained by plunging them, when white hot, into sealing-wax, repeating the operation until the steel is too cold to enter the wax. The tool is then just touched with oil of turpentine.

THE USE OF RIVETS for securing seams of steam boilers is being supplanted by electric welding.

SCIENTIFIC PROGRESS.

Telephone Vibrations.

A New Method by Which They are Made Visible to the Eye.

At a recent meeting of the Physical Society, Berlin, Dr. Frohlich made a further communication in connection with his older, resultless experiments on the objective demonstration of the vibrations of a telephone disk, in order to describe his new method by which positive results had been obtained. In his earlier experiments he employed manometric flames, and endeavored to photograph their movements with the help of a rotating mirror; now, however, he attached a small mirror to the iron plate of the telephone, and from this the light of an electric lamp is reflected on to a polygonal rotating mirror, from which it falls upon a screen. The vibrations of the plate were thus made visible on the screen, and since each side of the polygonal mirror cast its own image, when the mirror was rotated the curves were seen moving over the screen. The more rapidly the mirror was rotated the slower did the curves move over the screen, and when the rotation was as rapid as the vibration of the plate, the curves became stationary and could thus be exactly observed and drawn. These luminous curves could also be photographed. The speaker had employed this method in a series of researches on certain electrical phenomena which might influence the efficiency of the telephone. Thus the action of alternating currents, of self-induction, of the rise and fall of the current on making and breaking, of the introduction of electro-magnets, and of other conditions, were studied by means of the altered mode of vibration of the telephone plate. The speaker had further obtained a graphic record of the vibrations of the telephone plate when vowels and consonants are sung and spoken into it. Many other problems may, by the above method, be brought nearer to their solution.—*Science.*

The Great Heat of Siberia.

Siberia is commonly regarded as a region of ice and cold, but according to Mr. George Kennan, it is, in summer-time, about as hot a country as there is on the face of the globe. In one of his remarkable Siberian narratives given in the *Century Magazine*, Mr. Kennan thus relates one of his hot weather experiences:

"The farther we went up the Irtes'h the hotter became the weather, and the more barren the steppe, until it was easy to imagine that we were in an Arabian or a North African desert. Thermometer ranged day after day from 90° to 103° in the shade; the atmosphere was suffocating; every leaf and every blade of grass, as far as the eye could reach, had been absolutely burned dead by the fierce sunshine; great whirling columns of sand 100 to 150 feet in hight swept slowly and majestically across the sun scorched plain; and we could trace the progress of a single mounted Kirghis five miles away by the cloud of dust which his horse's hoofs raised from the steppe. I suffered intensely from the heat and thirst, and had to protect myself from the fierce sunshine by swathing my body in four thicknesses of blanket, and putting a big down pillow over my legs. I could not hold my hand in that sunshine five minutes without pain, and wrapping my body in four thicknesses of heavy woolen blanketing gave me at once a sensation of coolness. Familiar as I supposed myself to be with Siberia, I little thought when I crossed the frontier that I should find in it a North African desert, with whirling sand columns and sunshine from which I should be obliged to protect my limbs with blankets. I laughed at a Russian officer in Omsk who told me that the heat in the valley of the Irtes'h was often so intense as to cause nausea and fainting, and who advised me not to travel between 11 o'clock in the morning and 3 o'clock in the afternoon, when the day was cloudless and hot. The idea of having a sunstroke in Siberia, and the suggestion not to travel there in the middle of the day, seemed to me so preposterous that I could not restrain a smile of amusement. He assured me, however, that he was talking seriously, and said that he had seen soldiers unconscious for hours after a fit of nausea and fainting, brought on by marching in the sunshine. He did not know sunstroke by name, and seemed to think that the symptoms which he described were peculiar effects of the Irtes'h valley heat, but it was evidently sunstroke that he had seen."

THE ROOTS OF PLANTS AS MANURE.—An important part of good farming consists in husbanding all the resources of the farm. One important resource of fertility is found in the stubble and use of plants. The roots of all plants serve to support the plants themselves and to gather food and water from the soil; they contain woody fiber and so are useful in providing vegetable matter to the soil, for which reason clover, being a full grower and a plant that extends its roots deeply into the soil, becomes a recognized agent in producing an improved condition in a partially impoverished soil. In some experiments at the Storrs School Experiment Station with cow peas, it was found that so much of the roots as could be pulled from a light loam with yellow and compact subsoil would give a yield of 558 pounds per acre. Another section of the same field would give of stubble and first six inches of roots 912.3 pounds, and that to a depth of 42 inches the yield would be 1207.8 pounds per acre. We therefore get some idea of the quantity of matter that under ordinary circumstances can be secured from an acre of ground. It is also found that an average crop of cow peas grown will leave in the soil by virtue of the roots and stubble, 14.5 pounds of nitrogen, 2 8 pounds of phosphoric acid; and 6.4 pounds of clover roots will leave in the soil 35.5 pounds of nitrogen, 10 pounds of phosphoric acid and 15 pounds of potash, and with the stubble 180 pounds of nitrogen, 71 pounds of phosphoric acid and 77 pounds of potash, or a value equivalent to that paid for some of the commercial fertilizers in the market per ton. Thus it is seen the important part played by the roots of plants in the matter of adding to fertility.

NATURAL GAS IN SOLID CHUNKS.—The Cleveland, Ohio, *Press* of August 1st gives the following, which perhaps should be received with more caution than was the first announcement of the solidification of petroleum, which, however, proved to be a reality: The process of condensing natural gas, invented and patented by Adrian Hill of this city, is attracting widespread attention. Every mail brings letters from capitalists inquiring into the merits of the invention. The great possibilities of it have attracted the attention of the Standard Oil Company, and representatives of that corporation from Cleveland and New York have made the inventor flattering propositions should the plan prove a success. Hill said there could be no doubt as to the possibility of his process. He is now engaged in the construction of necessary apparatus, and will shortly give a practical exhibition by reducing a quantity of natural gas into solid substance. The process itself, as well as the machinery needed to carry it out, is very simple. Gas when transformed into solid matter is not dangerous to handle. Its expansive force is very great, and when the substance becomes heated above a certain degree it will become very volatile and will burst an ordinary cask or can, but the effect is gradual, and it does not explode. The inventor claims that with a ten-horse power engine he can reduce enough gas in one day to supply a city of 50,000 inhabitants with fuel for 24 hours.

ENCOURAGING SCIENCE.—The Vermont Microscopical Association has just announced that a prize of $250, given by the Wells & Richardson Co., the well-known chemists, will be paid to the first discoverer of a new disease germ. The wonderful discovery by Prof. Koch of the cholera germ, as the cause of cholera, stimulated great research throughout the world, and it is believed this liberal prize, offered by a house of such standing, will greatly assist in the detection of micro-organisms that are the direct cause of disease and death. All who are interested in the subject and the conditions of this prize should write to C. Smith Boynton, M. D., Sec'y of the association, Burlington, Vt.

A NEW MOTIVE-POWER.—As motive-powers, steam and electricity are threatened with a new rival. M. de Susini, a Corsican doctor, has, it is asserted, after 20 years' perseverance, constructed a motive apparatus or propeller, of 20-horse power, which is worked by sulphuric ether, a result which the doctor anticipates will realize a saving of 65 per cent of the combustible material at present employed for setting machinery in motion. Experiments with the apparatus have been made before scientific men at Paris. To pronounce any decisive verdict on the merits of the new agent would as yet, however, be evidently premature.

NEW METALS.—According to the *Chemiker Zeitung* (Coethen), at the last sitting of the Russian Mineralogical Society, K. D. Chrustschoff demonstrated the existence of a new metal which he has just discovered, and to which he gives the name russium. It approximates closely to thorium, and is one of the bodies whose existence was foreseen by Prof. Mendlejeff. We learn also that Dr. Kruss has named the metal which he has detected along with nickel and cobalt, gnomium.

AN ABSURD PARAGRAPH has been going the rounds of the papers, stating that a mild winter always indicates an unusual number of thunderstorms in the succeeding summer. Thunderstorms, more than any other meteorological phenomena, are dependent upon local and temporary conditions, and the unseasonably warm weather of last winter will have no more effect upon the summer's electrical disturbances than it will upon the next Presidential election.

A HOP-PICKING MACHINE has been invented lately by R. W. Peterson. The Santa Rosa *Republican* says it separates the leaves from the hops, leaving the latter free from both stem and leaves. The invention is claimed to be a great saving in time and labor in harvesting this important crop, and samples of work shown prove that it works successfully.

FROM the general appearance of the vegetation, together with a discussion of the origin and relations of the flora, it is concluded by eminent botanists that Greenland is not a European province from the point of view of botanical geography, but has nearer relations to America.

GOOD HEALTH.

Vertigo.

Any disturbance of the blood circulation in the internal ear, especially in that portion known as the semi-circular canals, will give rise to a feeling of dizziness or vertigo. This symptom is by no means uncommon, and is so often felt by persons who are otherwise in perfect health that little attention is generally paid to it. It is true that in many cases one may be perfectly safe in not heeding it, yet recurring or prolonged attacks of dizziness should never pass unnoticed.

In what is known as Meniere's disease, which is associated with a chronic affection of the internal ear, the patient suffers paroxysms of intense dizziness, accompanied with loud ringing in the ears, the attacks becoming more and more severe and prolonged as the disease progresses.

In the great majority of cases, however, the explanation of the vertigo is to be found in some local departure from the normal condition, the real source of the trouble being perhaps at some distance from the parts affected.

In the ear itself we may have a foreign body pressing on the drum membrane, or an increased pressure in the drum cavity, such as happens when the passage to the ears is stopped, and an excess of fluid accumulates. The same condition may arise also from an error of vision, in which case it can be explained only by the intimate nervous connection between the two organs, an overstraining at one portion of the nerve circuit showing its effects at the other.

Most interesting of all, however, is the connection between this symptom and certain disturbances of the stomach. Vertigo and nausea often go together, as in the case of persons who swing violently, or in those who are seasick. By means of the intimate nervous connection, any irritation or disturbance of the functions of the stomach will react on the blood supply of the ears, and vertigo may thus be an indication of indigestion or an overloaded stomach.

The heart is still another organ connected with this same nervous chain, and this fact explains how it is that palpitation is sometimes met with under similar circumstances. This fact may serve as an additional warning against the use of alcohol and certain drugs which cause dizziness when taken into the stomach.

In persons of full habit, with large excess of blood, vertigo may precede an attack of apoplexy. In any case, the wise course is to avoid all effort, and remain in a reclining position while the attack lasts.

"FORTY WINKS."—Sound, refreshing sleep is of the utmost consequence in securing good health, and no substitute can be found for it as a restorer of vital energy. Sleeplessness is, however, often a source of great trouble to elderly people, and one which is not easily relieved. Narcotic remedies are generally mischievous; their first effects may be pleasant, but the habit of depending upon them rapidly grows until they become indispensable. When this stage has been reached the sufferer is in a far worse plight than before. In all cases the endeavor should be made to discover whether the sleeplessness be due to any removable cause, such as indigestion, cold, want of exercise and the like. In regard to sleeping in the daytime, there is something to be said both for and against that practice. A nap of "forty winks" in the afternoon enables many aged people to get through the rest of the day in comfort, whereas they feel tired and weak when deprived of this refreshment. If they rest well at night there can be no objection to the afternoon nap, but if sleeplessness be complained of the latter should be discontinued for a time. Most old people find that a reclining posture, with the feet and legs raised, is better than the horizontal position for the afternoon nap. Digestion proceeds with more ease than when the body is recumbent.

WHAT THE KNEES INDICATE.—The knees of a man are an unimpeachable index of his character; that is, if they have not been injured so that their natural action is impaired. A strong character is accompanied with a strong walk. A weak character is shown in the weak knees and the shilly-shallying, scraping walk. If one should desire the performance of a deed which requires nerve and perseverance he would never trust it to a man who drags his legs about as if they were made of lead, or who walks as if his legs were half asleep. If you want to measure a man's character, and have not the time to scrutinize and analyze his features and through them the soul, study his nether extremities and how he uses them. You will get from his legs in action, and sometimes from his legs in repose, the general outline of his being. And you may be quite sure that the idea you so glean is, in nine cases out of ten, the correct one.—*Detroit Free Press.*

IS ICE WATER A HEALTHY DRINK?—In the opinion of the editor of the *Sanitary Volunteer*, the official organ of the New Hampshire Board of Health, there is a great deal of sentiment and many opinions regarding the use of ice water that vanish when the light of reason and experience is turned upon them. The fact is, that ice water, drank slowly and in moderate quantities, constitutes a healthful and invigorating drink. There is no doubt that ice is a great sanitary agent, and every family ought to be provided with it during the warmer months of the year. It is true that the inordinate use of ice water, or its use under some special conditions and circumstances, is attended with great danger; so is the improper use of any other food or drink. The assumption that iced water is dangerous, and that iced tea or iced coffee, or iced lemonade is a harmless substitute, is simply a delusion. As the source of danger feared by some is the degree of cold, we fail to see clearly how flavor modifies the effect of temperature. There are individuals, undoubtedly, who cannot drink ice water without injury, and who ought never to use it, but to a great majority of persons it is refreshing and healthful. Its use, temperately and discreetly, is in no way to be condemned, which cannot be said of some of its substitutes.

POISONOUS ICE CREAM—THE TONKA BEAN — A well-known Hartford (Conn.) druggist offers as a possible solution of the frequent cases of poisoning from ice-cream the following suggestions: His investigation in the Glastonbury case revealed the fact that the cream, made in the same freezer but flavored differently, caused no poisoning, while those who ate of a particular lot of vanilla cream were all more or less affected. This led him to believe that the trouble was in the "vanilla" flavoring, and he succeeded in procuring a bottle of the extract that was used for this occasion for examination. So far as it was possible to ascertain without a chemical analysis, the "vanilla" extract contained not one trace of the true vanilla bean, but was simply a strong extract of the "tonka" bean, or, as it is sometimes called, "snuff" bean, which is a poison, although to the uninitiated it has a similar odor and taste to vanilla. The "tonka" bean sells for about $1 a pound, while the best vanilla beans cost from $15 to $20 a pound. The conclusion that the druggist arrived at was that all the mischief was caused by tonka beans, which unprincipled dealers sell for vanilla. It isn't well or safe to buy a cheap extract of vanilla.

EYESIGHT IN THE SCHOOLROOM.—Mr. Priestly Smith, ophthalmic surgeon to the Queen's hospital, Birmingham, has prepared for the school board of that town a series of golden precepts on this important subject, which, legibly printed on a mounted scroll, are to be hung up in all the board schoolrooms. Seven cardinal maxims are all that are considered needful for the scholar to bear in mind. These are: "Sit upright, sit square, keep your eyes at least 12 inches from your work, write on a slope and not on a flat table, read with your book well up, do not read very small print, do not work in a bad light, and if you cannot see your work properly, tell your teacher." As there is nothing like pictorial example, this is illustrated by four drawings exhibiting good and bad positions.—*New York Telegram.*

USEFUL INFORMATION.

How Gold-Leaf Should be Handled and Laid.

I find there are very few painters who know how to handle gold-leaf properly. I will give my mode, and would like to hear of a better one.

Procure a surface board, 2½ feet in length and 8 inches wide. Lay your book of leaf on this board, and with a knife or pair of shears, cut the back of the leaves off where they are bound together. Take a small piece of unbleached muslin, wet it with clean turpentine, and with this rub over the top layer of paper. Lift the paper and place on your board so the edge of the paper will extend half an inch or so over the edge of the board, so you can pick it up with ease. Care should be taken not to get the cloth too wet, or the turpentine will go through the first layer of paper and leaf to the second, and stick the two together.

Proceed in this way until about half of the book is lifted, if you need that much. It is best not to lift too much at a time, until you get it out the size wanted, as it will handle and cut much nicer if done while the paper is damp.

The above process is intended for large stripes only. For ½-inch stripes and under, in place of wetting with turpentine, lift the first layer of paper and give it a few rubs on your trousers' leg to get the chalk off, and then a few rubs on your hair. Then place back on the leaf, and press evenly and hard with the edge of your hands. Take care to keep the paper from moving on the leaf, as it will tear it if moved the least bit.

One leaf can be cut in pieces small enough to lay eight or ten feet of stripe, and, with a little practice, it can be done very speedily, too. In cutting, hold the paper so the pieces will fall on the board with their ends extending over the edge half an inch, so you can pick them up with the thumb and forefinger. Never attempt to cut the leaf with new or newly ground shears, but get the ones with which your wife lets the kids make paper dolls, and you will find those just right.

In using turpentine, do not lift more than will do the job in hand, as it will dry up and come off and be wasted, or stick to the paper so you cannot get it off. In using the outside leaf or cover, put it on while quite wet, or the leaf will not come off. The finish on the paper will stick the leaf and paper together, if allowed to dry. If painters using the tip will try this method, I think they will find they can lay twice the amount of leaf in the same time and with very little waste.—*W. V. G., in Varnish.*

HOW HAIR CLOTH IS MADE.—Many people understand, of course, how hair cloth is made, but for the edification of those who do not, we will explain the process. In the first place, horse hair cannot be dyed. It repels coloring matter. So to make black cloth it is necessary to secure natural black hair. The horses, in many cases absolutely wild, running unrestrained, are regularly corraled and shorn. Of course black hair is preferable, but sometimes gray stock is utilized. Not only the tails but also the manes are cut; the hair is bunched. These bunches seldom contain hairs of less length than two feet; some are even three and 3½ feet, and the thickness of the bunches is usually two or three inches. The hair-cloth looms are provided with what we may call a nipper, in place of a shuttle, and the nipper is so finely actuated that it travels across the warp and seizes from the bunches one hair only, the jaws of the nipper being too fine to grasp more than one, and carries it across the weft threads, dropping it into its exact place. The action of the loom mechanically forces the hair next to its predecessor, the warp crosses upon it, snugly holds it in its place, the nipper travels back and seizes another, and so on and on. The delicacy and almost human accuracy with which each separate hair is placed between the warp threads is really incredible.—*Upholsterer.*

VEGETABLE DIET.—The Chinese are vegetarians, partly on account of their religion, partly from force of long habit and perforce of circumstances. Their country is so densely peopled with human beings that the land must be closely cultivated to the best advantage. As every one knows, flesh-eating is a most wasteful practice, as the same amount of land will support 30 or 40 times as many persons taking the products of the earth at first hand, as when taking corn and other vegetable products at second hand in the form of flesh. In view of these facts, it is not singular that the few foreign cattle found in China are carefully preserved for labor instead of being eaten. A recent writer makes the following assertions: "Beef is never seen on a Chinese table, oxen and cows capable of working the plow being counted too valuable to the farmer to be consigned to the butcher. Very severe penalties are attached to the slaughter of these animals. The punishment for the first offense is a hundred strokes with a bamboo, and then two months in a wooden collar. Should love of beef or desire of gain induce a repetition of the crime, a second judicial flogging is followed by exile for life from the province."

KILLING ANTS.—A writer in the *Maine Farmer* tells how he kills ants: "I took about a half-saucer of molasses, and to this I added about a tablespoonful of Paris green, and stirred well, placed one in the cellar-way and another down cellar; and any time for a week or two, I don't remember just how long, if I went to these saucers I would see the shelves nearly black with them coming and going. I left them there until there were no signs of any ants around them. I never found one dead ant, and it has been four years since I fed them on molasses and Paris green, and yet, strange as it may seem, I never have seen one since. I will say, further, that our house is an old one and had been overrun with them for years. Care should be taken to keep all eatables out of the way. The ants disappeared from all parts of the house before they did from around the saucers. This has been my experience with ants, and if they ever return they will be fed the same as before."

DISHCLOTHS THAT GROW ON VINES.—A vine to shade the porch and furnish the next year's supply of dishcloths may be grown at the same time by planting a few seeds of luffa or dishrag gourd. It is quite common in the South. The vine, with its dark, silvery-green leaves, is quite pretty. The fruit is about two feet long, and it is the tough, elastic, fibrous lining that is used for dishcloths.

TRANSPARENT VARNISH FOR METALS.—For a green transparent varnish for metals, grind a small quantity of Chinese blue with double the quantity of finely powdered chromate of potash (it requires the most elaborate grinding); add a sufficient quantity of copal varnish thinned with turpentine. The tone may be altered by adding more or less of one or the other ingredients.

PRICE OF OLD BOOKS.—Books published 300 years ago sell for $25 to $500 a volume. Many modern authors, whose unsalable editions are reposing on book-sellers' shelves, must regret that they didn't have their works printed in the fifteenth century. But we don't suppose they thought of that.

AN ounce each of pulverized cloves, cinnamon and cedar perfumes agreeably and tends to keep moths from bureau drawers.

IN proportion to the population, there are more Massachusetts people in the State of Iowa than in Massachusetts.

ENGINEERING NOTES.

High Speed on Railroads.

A Hydraulic Railway.

A large amount of attention seems to be directed, just at this time, to high speed on railroads. Fifty and sixty miles an hour, and that only for short distances and on straight and level grades, was the utmost that was looked for a few years ago; but at the present time nothing less than 100 miles would seem to meet expectation in the early future. The projected parcel railway, as described in these columns two weeks ago, promises a much greater speed; but that is only for mail and express matter. No passengers will be carried.

There are many things connected with high speeds on railways which tax the ingenuity of locomotive engineers to the utmost. The lines have to be made strong enough to withstand the heavy blows of the locomotive, for the other portions of the running plant are light in comparison. A railway train running at 60 miles an hour may be compared to a huge projectile, and subject to the same laws.

The wonderful hydraulic or "Water Railway," as exhibited in Paris, although looking very much like a flight of fancy, may, if it be found at all practicable, prove a neck-and-neck competitor with the electric railway for high-speed railways. This extraordinary invention has a carriage without wheels. For the wheels hollow slides or skates are substituted and the carriage is pushed along in a grooved rail. When it is desired to set the carriage in motion, water is forced into the slide or skate of the carriage from a reservoir by compressed air, and seeking to escape, it spreads over the under surface of the slide, which it raises for about a nail's thickness above the rail. The slides thus resting, not on the rails, but on a film of water, are in a perfectly mobile condition; in fact, the pressure of the forefinger is sufficient to displace a carriage thus supported. The propelling force is supplied through the pillars, which stand at regular intervals on the line between the rails. Running underneath every carriage is an iron rack about six inches wide, fitted with paddles.

Now as the foremost carriage passes in front of the pillar, a tap on the latter is opened automatically and a stream of water at high pressure is directed on the paddles. This drives the train on, and by the time the last carriage has passed the tap (which then closes) the foremost one is in front of the next tap, the water's action thus being continuous. The force developed is almost incredible. There is some splashing on the rails at the start, but this diminishes the faster the train goes. To stop the train, the small stream of water that feeds the slides is turned off and the latter coming in contact with the rails, the resulting friction stops the carriage almost instantaneously.

A correspondent of the London *News* gives the following as his experience on the short experimental road in operation on the *Esplanade des Invalides* at Paris: "The train consisted of four carriages, affording room for about 100 passengers. Having taken our seats, and the signal being given, we glided along gently for the space of a few yards, when suddenly we gathered speed; two or three tugs were felt and we were flying on at the pace of an ordinary train, but as smoothly as a boat on a river. There was a clicking noise on the rails; but this I was assured was due to a defect in the construction of the slides, and would be remedied. The absence of any vibration, or shaking, was wonderful. A slight jerk there was at regular intervals, but then again I was told that it was due merely to the shortness of the course and the inability to get up a proper pace. In a hydraulic train traveling at full speed, that is to say, at the rate of 87 to 124 miles an hour, there would be almost no consciousness of motion. The journey down the length of the esplanade only occupied a few seconds. A water train running at over 100 miles an hour could, I was told, be pulled up within 30 yards, could climb up gradients of 16 inches in the yard, descend them with equal safety, and run on curves of 44 yards radius. This system would seem peculiarly adapted for elevated railways in cities, being light, noiseless, smooth, without smoke, fast and thoroughly under command."

High-speed traction is in the air, and various schemes are afloat to still further annihilate distance, an essential part of such schemes being the use of stationary engines at points along the line. While mechanical difficulties of an apparently insurmountable nature seem to arise at the suggestion of such speeds, there are not wanting engineers who believe in the possibility of both these undertakings, and great interest must attach to the experiments, which may lead to the development of railways working at speeds almost undreamt of, except in the scientific romances of the present day.

ROPE DRIVING WHEELS.—In many of the large manufacturing establishments in England the practice is to bore the hubs of large rope driving wheels larger than the shaft, and hang them on keys—an old millwright practice in this country. This insures getting the wheels to run true, which is not always an easy thing to do in the instance of wheels from 30 to 40 feet in diameter bored to fit the shaft.

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Business Announcements.

[NEW THIS ISSUE.]

Receipt Book—Henry Carey Baird & Co., Philadelphia.
Superintendent Wanted—Saul Samuel, London, S. W.
Partner Wanted—"C. H. C.," Box 2517.
See Advertising Columns.

Passing Events.

The news from Alaska is not encouraging for quartz-mining. The largest mine, the Treadwell, has some of its stamps lying idle for want of drillers. The Bear's Nest has shut down altogether for lack of ore.

There is some complaint from the interior about the agents of a Michigan syndicate taking up tracts of timber land where there is mining ground. It seems too bad that it is possible to obtain universal ground under agricultural and timber titles, but a good deal of mineral ground is being occupied in that way.

The reorganization of the Sutro Tunnel Co. means increased work up there. It is said that the new company will pursue a vigorous policy.

Register Bradford of the San Francisco Land Office has received a circular letter from the General Land Office, directing him to cancel all filings on all sites for reservoirs, ditches, or canals, which may have been reserved for irrigating purposes by the Geological Survey, and lands which may be susceptible of irrigation by such reservoirs which have been made since Oct. 2, 1888.

There is considerable activity in certain portions of Mono county as is indicated in our mining summary. There is still a great extent of unprospected country in that and Inyo county.

Bimetallism Abroad.

A late issue of the New York *Journal of Commerce* gives a full synopsis of Consul Mason's reports on the growth of bimetallism in France. Located as he is at Marseilles, and occupying the honored position of representative from this country, he has rare opportunities of studying the subject in its various bearings, and therefore his report is a valuable contribution at the present time. Consul Mason says that the Bimetallist Commercial party in France has gained enormously within the past two years. The Consul in his report to the State Department at Washington incloses an extract from a statement published by the official organ of the Marseilles Chamber of Commerce, which gives the keynote to the agitation now going on not alone in France, but also in Germany and the United Kingdom. As the excerpt contains much of interest we present the same not only for the benefit of the mining industry, but also for advocates of the double-standard metallic currency. The extract is as follows:

But if silver has lost so largely from its value in Europe, it is not so in India and China, where it is eagerly sought for in exchange for agricultural and manufactured products. In order to obtain our silver, which she needs, Asia has only to send us her merchandise, and naturally she sends it to us as copiously as possible. Now the present depreciation of silver in Europe (or, in other words, the appreciation of gold) amounts to 27 per cent, and it constitutes a premium of 27 per cent on Asiatic exportation and a disadvantage of an equal percentage on our export commerce to Asia. It should be remembered, moreover, that the people with whom we are under this detestable disadvantage comprise seven-twelfths of the inhabitants of the globe. The demonetization of silver which has taken place in the countries of the Latin Union thus constitutes for India and other countries with the mono-metallic standard a protective duty against importations from Europe. European products sold in Asia are paid for in silver, and, since silver now loses 27 per cent, our exporters are obliged to increase by that proportion their export prices in order to realize the same profits that they obtain upon goods sold at home. But at these exaggerated prices they find no purchasers, and the double result of the monetary revolution accomplished in 1873 has been to flood our markets with foreign products at prices which defy home competition. Wheat, cotton, oleaginous grains, sugar, wool, raw silks, corn and manufactured goods from Asia, and wool, tallow and hides from South America, are poured in upon us in ever-increasing quantities, while their markets are practically closed to us by this fatal disadvantage of exchange.

It is therefore of the first importance to re-establish the equilibrium arbitrarily broken in the monetary circulation, and to end the trouble which paralyzes commercial relations and overrides import tariffs by suppressing the abnormal advantages now enjoyed by the countries whose standard of currency is silver. To do this there should be a general return to the French bimetallic standard as established by the law of the year IX (March 29, 1801), with a fixed relation between the values of gold and silver. This system was thoroughly and successfully tested for 70 years, and it furnishes the only secure guaranty against the violent and disastrous perturbations caused by the present variations between the values of the precious metals.

The presentation of bi-metallism so tersely and strongly as that made by the Marseilles Chamber of Commerce, must have weight, coming as it does from a representative class that speaks by experience. Evidently the same line of argument is being put out by its advocates in England, for we find in the London *Mining Journal* of August 17th a long and well conceived editorial, temperate, but nevertheless augumentative, which virtually takes the same ground. The editorial in question, after presenting seemingly well recognized but rather spacious arguments against bi-metallism, says:

Those nations, which are, at the present moment, endeavoring to show the advantages of bi-metallism, were the first to adopt trade protection as a panacea for the difficulties against which they had to contend, and they have not yet by any means convinced British manufacturers of the complete effectiveness of a system of reprisals. Such may be the case with bi-metallism as with protection; so with the double monetary scheme. Both are founded on laudable principles, though it must be admitted that the principle of bi-metallism has the stronger and more effective bearing upon trade. Bi-metallism, indeed, is so satisfactory in principle that the exhaustive discussion to which it has been subjected is well merited, and if, after such a careful consideration, the divergence of opinion is so evenly balanced, it may fairly be assumed that an adoption of a double system of currency is not likely to have any serious detrimental effect upon trade, but that it may possibly rectify the many disadvantages from which British commerce undoubtedly suffers. There is every reason for believing that an agitation properly conducted by the advocates of bi-metallism would have a strong effect in arousing public interest in a question that is little understood; and though perhaps unable to show the complete connection between bi-metallism and trade improvement, the perceptible influence which the one almost certainly exerts upon the other may yet be demonstrated.

The *Mining Journal* admits that English bimetallists are assuming the aggressive, and that the action which is being taken by them "to make the currency question an important factor in party politics has much greater significance than is generally imagined. This significance rests not so much upon the position which the advocates of the scheme have taken, as upon the strength of the agitation which is sure to develop after a long period of comparative quiescence. The movement has hitherto been characterized with what may be called a passive quality, when full consideration seems to have been given to every phase of the question. This, of course, is the great essential to the successful development of any scheme of such wide-spreading application as that of the double system of currency."

Such admissions as the above by a journal having so wide a reading as the London *Mining Journal* evidently enjoys, shows a slow but steady change of heart which will result in a more formidable move that must end in success for bi-metallism.

Reorganization of the Sutro Tunnel Co.

An Albany, New York, telegram received the past week reports that the Comstock Tunnel Company filed its certificate of incorporation in the Secretary of State's office on August 30th. The company has a capital of $4,000,000 divided into 2,000,000 shares at $2 a share. The company is formed for the general mining business, accumulating, conducting, selling and supplying water for mining purposes, and lands and water-power suitable for mining purposes. The incorporators are Herman R. Raltzer, Peter C. A. M. Vanweel, Eugene Seligman, and Otto Loewengred, Theodore Sutro, Gordon MacDonald and Henry E. Kavanagh are named as trustees. The headquarters of the company will be in New York, and its operations will be carried on in the town of Sutro and counties of Lyon, Storey and Washoe, Nevada.

This is nothing more or less than a reorganization of the Sutro Tunnel Company with a reduced capitalization. The new company acquires all the property rights and privileges of the old organization. The franchise granted by the United States to the Sutro Tunnel Company is one of the most valuable that could have been given any similar organization, and which, with a more thorough development of the mines at Virginia City, Nevada, ought to give the new company quite a princely income. With no incumbrancees and having a reserve capital, with a monthly income more than meeting current expenses, the Comstock Tunnel Company can and doubtless will extend their tunnel further west so as to drain the valuable lodes known to be west of the Comstock, or, as some call it, Bonanza lode. In extending the tunnel important and valuable developments are more than likely to be made. Besides extending the tunnel west, a north lateral tunnel can be or rather should be run north from a point opposite to the mouth of the south lateral tunnel that drains the Gold Hill mines. A north lateral tunnel will admit of the North End mines being worked to a better advantage, besides the probability of making important developments.

It is very generally admitted that the Comstock Tunnel Co. will commence active operations next month looking to the more thorough development of their property.

APPRECIATIVE.—The man who was sent down from this city to the U. S. of Columbia to set up and run a Dodge ore pulverizer was well treated by those who purchased the machine. They were so well pleased with his work and that of the machine that they made him a present of $1000 in addition to his pay.

AN ACID TRUST.—A dispatch from New York says: The chemical trade is much agitated over the formation of a combination of 13 acid manufacturers of New York and vicinity, which virtually controls the manufacture and sales of acid in this market and in America. Prices have already been advanced.

"No Patent, No Pay."

In addition to what was said in the PRESS of last week concerning the methods adopted by patent-selling agencies, it may be well also to call the attention of inventors to a plan adopted by certain patent-soliciting firms. Some of these people advertise extensively and hold out the tempting announcement of "no patent, no pay," which leads the inventor to believe that the firm will obtain the patent from the Government or ask no money. In the first place, the Government fees must be paid anyhow and the inventor is called upon for them; and other means are adopted for obtaining money, so that in the end the inventor pays a pretty good bill. A letter received by us this week explains what other tactics are sometimes adopted. After warning inventors against a certain firm of Washington patent agents, our correspondent says:

They advertise that they charge no fee unless a patent is allowed. The trick is this—Among the claims of the application for patent, they insert one of no importance, as, for instance, three brass tacks on a threshing machine. They allow the patent to be registered, but insist on this one claim, which, of course, is allowed, and they claim their fee. I was swindled in this way by the firm referred to four or five years ago. I paid their claim and have their receipt. Now for another swindle: Yesterday, I received a demand for this same old bill for which I hold a receipt, with a threat that if not paid by the 22d of this month, my name will be published all over the country by the U. S. Mercantile Protective Association in a *secret* circular as a delinquent debtor

The legitimate patent agents cannot conduct business in any such way, nor can they take the risks of conducting business on a contingent basis. They act as attorneys for the inventor, presenting his case properly before the Patent office, for which a suitable fee is charged. They endeavor to obtain good claims on the patents of their clients, and it is their duty to make such arguments when necessary, as will convince the officials of the justness of the claims.

The value of a patent depends largely on the claims allowed, and it needs an expert to draw these claims.

Eastern Oregon Mines.

In conversation with a prospector who has recently come from Eastern Oregon, we learn that considerable work is going on at Cracker Creek and thereabouts. Our informant thinks that it is a fine country, but there is too much stock-jobbing going on for the good of the section. The Excelsior and Eureka Co. are working 150 men. They have a 40-foot ledge, the ore in which is from two to six feet wide. The ore is rather low grade to pay under the extravigant system in which operations are being conducted. They are putting up a mill of 40 stamps, arranged to be increased to 60 for treating rebellious ores. The freight alone on the machinery from Chicago was $10,000. The owners are St. Louis people, mainly railroad men, with little knowledge of mining.

Another range of country 20 miles from Cracker Creek, in the Greenhorn mountains, is attracting great attention. The days of placer mining have gone by and capitalists are interesting themselves in quartz.

It is only of late that Eastern capital has come into the mining regions of Oregon. The Portland men have put up machinery in several places for treating free gold ores, but at a short distance in depth the ores became base and the plants would not treat it. This mistake has been frequently made.

The Bellevue, Granite Creek, is a fine mine. There is a wonderful placer country near there. The ledges are right in the heart of the mountains, where the placer gold has been found. The prospects of Eastern Oregon quartz are excellent, and unless unfortunate speculations injure them the country will prove a rich one.

BEARTOWN district is an old placer mining camp of Montana, where 15 years ago there were 3000 people. A few people are now prospecting for quartz. Among the old settlers who still reside in the camp are Roger O'Hara, Michael Kelly, John Lehsau, Chris. Cowdy, Walter Dumphey, Patrick Woodlock and a number of others.

THE Butte Miners' Union will have in the near future the finest and most complete library in Montana, and it may be said, says the *Inter-Mountain*, to the credit of W. E. Deeney and Phil Hickey, that the idea first originated in the minds of those gentlemen.

Working a Chinese Coal Mine.

(*Continued from page 181.*)

the coal is filled with dead stuff of soil, clay and stone sent down from the surface to No 1 level by self-acting packing inclines (Fig. 6) in packing-tubs which open at the sides. From the bottom of these inclines packing-tubs full of dead stuff are pushed away to the stalls and emptied into the stone shutes by special men called packers.

The coal as it is broken down is loaded into willow baskets which are put on small wagons and run to the coal shute. As the working face advances, the packing follows. Slice after slice is thus removed in ascending order. Coal shutes are constructed by building two pack-walls, 3 feet apart, and covering with 3 inch plank as seen in Fig. 11. Sending down the coal through these shutes reduces it all to dust, but the natives prefer the coal in this form.

To obtain lump-coal, self-acting inclines are made as shown in Fig. 7. The same method is applied to the working of thick seams, such as No. 12, which is 35 feet thick (Fig. 8). This is divided into five slices parallel to the stratification, which are worked off successively in ascending order like so many distinct seams of 7 feet thickness. The average cost of packing per ton of coal is 4 cents. In other coal seams this packing method is so costly that the long-wall system is employed. With this packing system very little timber is required, and the surface is preserved intact.

Haulage is accomplished solely by mules and ponies, the former costing $30 and the latter $20. Winding is done by ordinary engines and wire rope.

Fig. 2 (in last week's PRESS) shows the system of mine drainage. The water is taken to the surface in two lifts. First, the water in No. 5 seam dip-workings is hauled up to No. 3 level in water-cages by a pair of winding engines of 18-inch cylinder and 30-inch stroke. From this point (*B*) the water is lifted 260 feet to a wrought-iron tank (*C*) communicating with a stone drift (*D*) which runs into the sump (*E*) of the up-cast shaft, whence it is forced to the surface by a ram. The power consists of two differential compound engines of Davey's patent, with 50-inch high-pressure and 30 inch low-pressure cylinder. All the pump-rods are wrought iron, six inches in diameter, except a few of American pitch-pine.

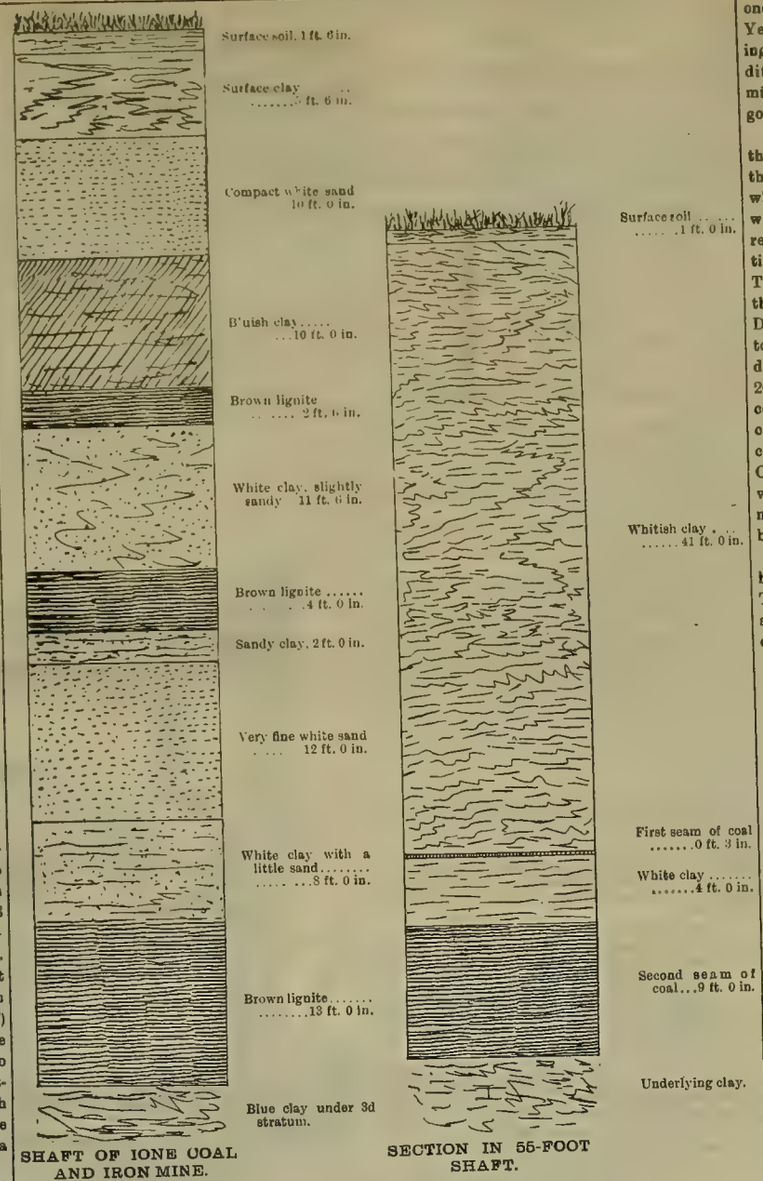
The mine is ventilated by a Guibal fan of 30 feet in diameter. Candles and open lamps are used in all seams except No. 5, where safety lamps only are allowed.

The underground workmen belong to the lowest class of society; but, although ignorant, are very obedient and of a kind disposition. They possess many remarkable traits. Stealing is considered by them a virtue, and, although searched by a special staff of officers when they come out of the pit, yet they frequently manage to take away such things as bolts, fish-plates, nuts, nails, and even brattice-cloth, which they tear away from air-stoppages. In case they are caught they are not only fined for the cost of the article, but receive a punishment of 100 blows on their backs.

The Chinese miners wash themselves only once a year. This annual ablution is for New Year's, when they dress up in their fine clothing and receive and make visits. It would be difficult for a stranger at first sight to determine whether the miner belonged to the Mongolian or African race.

The men are very fond of sleeping when they ought to be at work. If one is caught in this condition, and after being awakened, asked why he is not working instead of sleeping, he will face the overseer with a grin and calmly reply that he was not sleeping at all, but was tired and merely sat down to rest himself. The Chinese miners are somewhat superstitious; they believe in evil spirits and bad omens. Daily wages are paid as follows: Interpreters to foreign overmen, 20 cents; pony and mule drivers, 20 cents; sinkers, 20 cents; masons, 20 cents; enginemen, 20 cents; coal miners, 15 cents; door-boys, 13 cents; switch-boys, 13 cents; drain-boys, 13 cents; drum-boys, 13 cents; Cantonese boatswains or pumpmen, $1; Chinese pit deputies, $1. These wages seem very low, but it must be considered that the men do only one-fourth the work accomplished by English miners.

The daily output of coal is 950 tons, which is hauled up in two shifts of eight hours each. The coal is sold for from $4.20 to $8.40 per ton, according to quality, the dust bringing the lowest figure and the lump the highest.



SHAFT OF IONE COAL AND IRON MINE. SECTION IN 55-FOOT SHAFT.

FIG. 11.

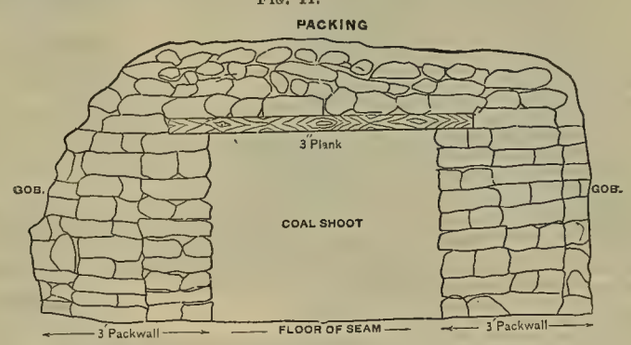


FIG. 10.

Amador County Lignite.

In Amador county, in this State, a brown lignite is found in several localities. In the Ione and Buckeye valleys considerable work has been done, especially by the Ione Coal & Iron Co. The cut given herewith shows the different strata encountered on a depth of 80 feet. Underneath the lower stratum of coal lies a dark-bluish, sandy loam. This stratum has been penetrated in two places, by boring, to a depth of 600 feet—one in Buckeye valley and one in Ione valley. This formation was not passed entirely through, notwithstanding so great a depth was attained. No water was encountered in either exploration. Specks of coal were found, here and there, scattered through the clay for 20 feet below the lower stratum of coal than these indications of the proximity of coal-beds ceased altogether, and the material passed through to deepest depths attained was a mixture of dry clay and sand; but bedrock proper was not reached below the third stratum of coal, in either Ione or Buckeye valleys. In regard to the coal of Amador county, it may be said that it belongs to the later pliocene, the same age as the lignite occasionally found in seams of the auriferous gravel underlying basaltic lava in several counties.

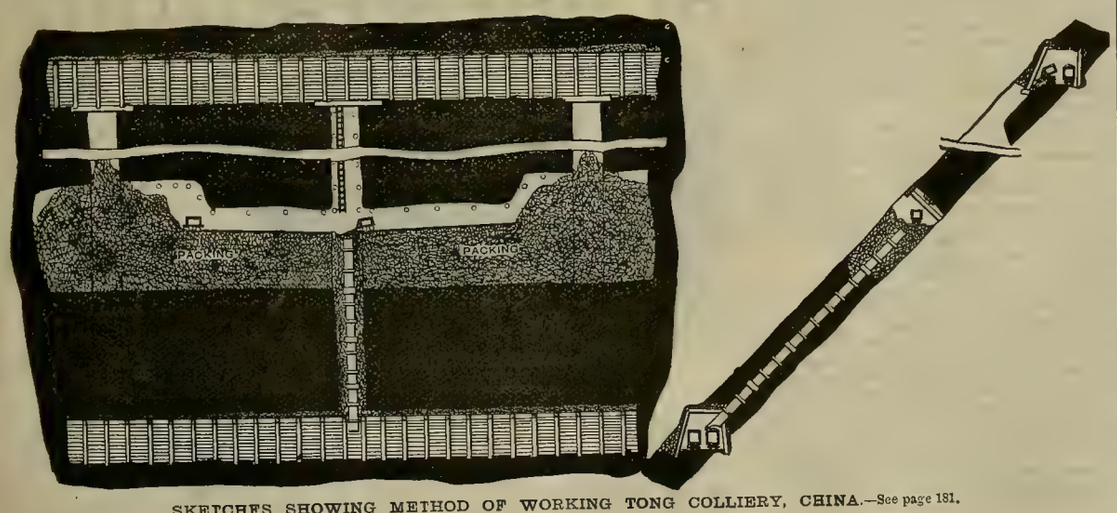
The Sacramento and Ione Coal Co., in Ione valley, have 132 acres of coal land, with mining equipments. The coal-bunkers are connected by side-track with the Ione branch railroad. The mine has been operated some 13 years. The developments consist of a main incline having a southerly slope of one-half inch in one foot for 500 feet; a main drift through the coal 800 feet, and exploration on the east side for 1000 feet, one a shaft 75 feet deep, the second air shaft 54 feet deep, connecting with the main drift 1000 feet southeasterly from the mouth of the incline. In this mine two coal strata occur. The upper one, three feet above the lower one, has an average thickness of eight inches. The lower one, varying in thickness from 6 feet to 24 feet, is separated from the upper and smaller stratum by three feet of brownish-white clay. Below the lower stratum of coal there is always found white clay.

From 6 to 12 feet of thickness of coal, which is the better partion, is extracted. As in the other coal mine near Ione, no powder is employed. No hoisting works are needed, but mules are employed to bring the coal up the slight incline (which may be considered more of a tunnel than an inclined shaft), in cars holding an average weight of 1600 pounds. One side of the mine is worked at a time. The other side is simply blocked out and left standing, that the coal, when moved, may contain less water.

The same prices obtained for this coal as for that of the other producting mine: $1.50 per ton for that which in more finely broken and $2 for "lump," or house coal. The usual yield of this mine is 70 tons per day, and the coal is sold as fast as extracted.

There is very little water in this mine, even

METHOD OF WORKING STALLS, TONG COLLIERY.



SKETCHES SHOWING METHOD OF WORKING TONG COLLIERY, CHINA.—See page 181.

during the rainy season. No legging is used in the mine, and no other timber is required than posts and single caps. These caps are usually 4x6 inches and 18 inches long. The timber for posts is of all kinds, and anything is taken that may be conveniently found on the ranch.

The contractor mines and delivers the coal into bunkers near the railroad switch for 75 cents per ton, and furnishes labor, tools, oil and mules. He employs about 20 men and boys, at rates from $2.50 to $1.50 per day. One man is employed on the day shift at $3.50 and one at night for $3.

The coal is mined in blocks 15 feet square and 6 to 12 feet thick. After blocking out into squares each alternate square is taken, commencing at the soft coal on the outer rim of the basin; then the alternate pillars which were left are removed, and in their stead are placed posts and single caps, about four feet apart. The ground is then allowed to cave. In this way all the coal of suitable grade is removed.

The 75 foot shaft passes through 2 feet 4 inches of surface soil and gravel; 44 feet of white clay; 8 inches of the first stratum of coal; 4 feet of brownish clay with no grit; and 24 feet of the second stratum of coal. The white, sandy clay below the coal was penetrated 10 feet. The 54-foot shaft, connecting with the main drift, passed through the strata shown in the accompanying cut, which, with description, is taken from the State Mineralogist's report.

As an illustration of the comparative cheapness of shafts sunk in this formation, for air or pumping purposes, it may be mentioned that this 54-foot shaft was sunk for $50, and an offer was made, but not taken, to sink one a hundred feet deep for $75. The refusal of the offer was based on the opinion that too much was asked for the work contemplated. The cost of the 54-foot shaft may be estimated as the cost of sinking a like number of feet anywhere in this formation.

Mining Bureau Appointments.

Up to this week no field work has been done this fiscal year by the State Mining Bureau, owing to the appropriation having been withheld by the State Controller on technical grounds. A decision of the Supreme Court has, however, made the money available, and on Tuesday a meeting of the trustees of the bureau was held, and the following appointments made with the advice of the State Mineralogist:

W. A. Goodyear, geologist in chief (reappointed).
H. L. Watts, assistant geologist (reappointed).
H. J. Willey, engineer in chief of topographical and geological work.
J. H. Crossman, engineer of mines and field assistant (reappointed).
Adolph Webber, field assistant.
John Hayes Hammond, mining engineer and mining inspector (reappointed).
W. H. Webb, expert on mining machinery.
E. B. Preston, mining engineer and geologist.
Professor Ross E. Brown, civil and mining engineer.
Dr. W. D. Johnson, chief chemist of the mineralogical and metallurgical department.
Professor C. A. Ogden, assistant chemist (reappointed).
Carl Schneider, mineralogist and crystallographer (reappointed).
H. T. Durdeen, custodian of the museum and acting secretary (reappointed).
Miss Maggie Maynard, librarian (reappointed).
W. Ellingswood, janitor (reappointed).

State Mineralogist Irelan, though annoyed at the delay, intends to accomplish as much as possible during the season, and will immediately start his assistants out in the field. The appropriation amounts to $100,000, of which $70,000 is to be extended in field work.

ANTI-DEBRIS ASSOCIATION.—An Associated Press dispatch, dated Marysville, Aug. 31st, says: The annual meeting of the Anti-Debris Association of the Sacramento Valley was held in Yuba City to-day. The former officers were re-elected, namely: Pres., C. E. Stone; Manager, Geo. Ohleyer; Sec., B. F. Walton. The directors' report of the business showed a gratifying condition of affairs. Very little illicit mining has been done during the past year, and that little under the claim of restraint of debris behind dams. The Government of the United States has largely removed the burden of litigation from the shoulders of the association, and at the present time only the agent of the association is kept traveling in the mountains, but the meeting resolved to maintain the organization and to take whatever further steps may be found necessary to complete the object of the association.

Mining Personals.

J. H. Barfeind is now in charge of the Bear's Nest mine, Alaska.

H. N. Palmer has tendered his resignation to the Congress Mining Co., A. T.

Benjamin Harrison is superintendent of the Pacific mine, Pinos Altos, N. M.

Frank Drake and Jno. Applegarth, mining men from Mexico, are in the city.

Isaac M. Taylor, the mine operator well known all over this coast, is in New York.

Chas. F. Hoffman, superintendent of the French Co.'s mines at Red Point, is in town.

Wm. Metcalf of Nelson Point is superintendent of the Bunker Hill Con. mine, Plumas county.

Mr. E. C. Van Blarcom, M. E., is in charge at the Hacienda de San Francisco, Pachuca, Mexico.

F. F. Coffin, superintendent of the Grand Prize and other Tuscarora mines, is visiting in this city.

R. S. Raw is superintendent of the Independence quartz mine, west of Placerville, El Dorado county.

H. H. Shorkley, superintendent of the Mt. Diablo mine, has gone back to Candelaria after a visit to the city.

E. T. Stoughton reports considerable prospecting being done in Silver Star district, Jefferson county, M. T.

J. A. Morehead is in charge of the development work on the Carson claim, belonging to a Kansas City Co., Pinos Altos, N. M.

Chas. E. Elliott and Chas. Hirschfeld have gone to Sierra City to look after some mining property they are interested in there.

Alvinza Hayward and W. P. Hobart left for Mexico on Thursday of last week to examine some mines there in which they are interested.

S. B. Christy, professor of mining and metallurgy of the University, is at New Almaden, studying up the geology of that quicksilver region.

George Arnott of Brandy City, Sierra Co., where he has for a long time been engaged in hydraulic mining, has gone to Scotland on a visit.

Gen. K. P. Keating, superintendent of the Savage, Hale and Norcrose, and Scorpion mines, has returned to Virginia City, after a visit to this city.

Jesse L. Pritchard of Denver has been examining properties in Gold Hill, N. M. Harry Fowler of Silver City, N. M., is putting up a five-stamp mill at Central.

Jacob Neff is superintendent of the Morning Star mine, Iowa Hill, Placer Co. The gravel extracted averages $6.33 per carload, and the mine is in a prosperous condition.

J. Waller, until recently a miner and prospector in Colorado, is the discoverer of a new mine called the Little Daisy, Carpenter Gulch, four miles from Blackfoot City, M. T.

James Cross, who has been superintending mines for the Mariposa syndicate, composed of John W. Mackay, John P. Jones, Alvinza Hayward and W. S. Hobart, is in the city on a visit.

William Fries, president of the Eureka Consolidated mine, has returned to the city from Eureka. He reports that the smelting works were started a week ago, and a telegram announced that the new refinery started Tuesday. There are about 1000 tons of ore and 1500 tons of speiss on hand, which will be worked.

John, Charles and Wm. Carveth, Richard and Thomas Veale and John Gill, miners from the Sierra Buttes mine (and members of the Sierra Buttes brass band) are among those who have left Sierra City. They have gone to the Granite Mountain mine, Deer Lodge county, Montana, where they have steady work at $3.50 per day.

Frank S. Bryant is superintendent of the Spanish R. M. Co., Deadwood, Dakota. The report made by Superintendent Bryant of the outlook and prospects at the mine were flattering. A vote of thanks was passed by the stockholders on the efficient manner in which the affairs of the company have been conducted for the year ending Aug. 27, 1889.

The Oroville *Register* says: Three old-time miners met the other day at the Perkins & Gallagher mine. They were L. A. Snow, E. W. Slater and Chas. Retson. The same three worked together at Bidwell Bar over 35 years ago. Retson has drifted off to stock-raising and farming, while Messrs. Snow and Slater still follow their occupation of so many years ago.

Superintendent R. K. Colcord has returned to Aurora from London, where he has been on business connected with the company he represents. It is stated for a fact, says the Walker Lake *Bulletin*, that he has a credit of $300,000, English money, to be devoted to the development of mines. This will help make Aurora a live camp for some time, and perhaps establish it permanently as a mining town.

Mr. D. C. Probasco passed through San Francisco last week from Oregon on his way to Inyo county. He had some idea of going to the South African gold fields, but the reports received were unfavorable. Mr. Probasco has been a prospector for many years, all over the coast. He says he has met many good prospectors who prefer California to any part of the northwest. There are better chances in this State, and if good prospects are struck, there are better opportunities to sell. The climate, too, is favorable for work at all seasons. Several prospectors returned from Oregon on the same steamer intending to strike out for the mountains in the State.

NEW SOUTH WALES.

THE GOVERNMENT OF NEW SOUTH WALES intends to establish METALLURGICAL WORKS on a scale sufficiently large for determining, in bulk, the best methods of treating Ores produced in the Colony.

A SUPERINTENDENT is REQUIRED to erect, control and direct these Works. He must possess the highest qualifications and widest experience, and it will be his duty to introduce the best methods of treating Ores (especially Auriferous and Argentiferous) with a view to extract therefrom the metals and other substances possessing an economic value. He would also have to impart full instruction in the various methods of treatment, and to afford every facility to Smelters and Miners for acquiring a practical knowledge of the processes employed.

Applications, stating candidate's age, salary required, and accompanied by copies of testimonials, must be sent, on or before the 25th of September, 1889, to The Agent-General for New South Wales, 5, Westminster Chambers, London, S. W. SAUL SAMUEL,
7th August, 1889. Agent-General for New South Wales.

WANTED!

A partner with capital to run in a tunnel and develop a large and valuable sulphuret claim; one of the best locations in the State. Full particulars given. Address, "C. H. C.," Box 2517, San Francisco, Cal.

Books on Working Ores.

BY GUIDO KUSTEL, M. E.

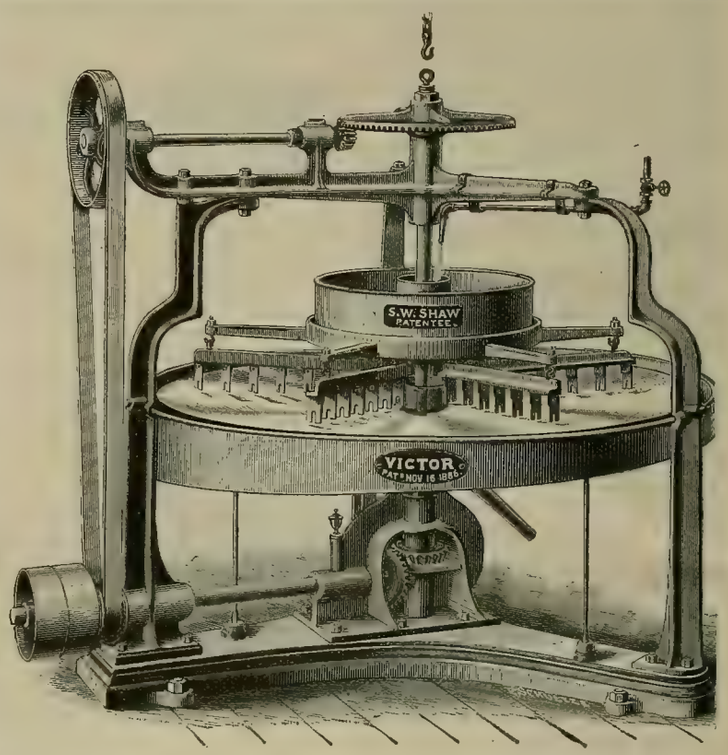
ROASTING OF GOLD AND SILVER ORES (Second Edition) and the Extraction of their Respective Metals without Quicksilver. By GUIDO KUSTEL, M. E. 1880.

This rare book on the treatment of gold and silver ore without quicksilver is liberally illustrated and crammed full of facts. It gives short and concise descriptions of various processes and apparatus employed in this country and in Europe, and the why and wherefore. It contains 156 pages, embracing illustrations of furnaces, supplements and working apparatus. It is a work of great merit, by an author whose reputation is unsurpassed in his specialty PRICE, $3, coin, postage free. Sold by DEWEY & Co., Publishers, 220 Market St., San Francisco, Cal.

BY C. H. AARON.

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ASSESSMENT NOTICE.

California & Nevada Railroad Company.—Location of principal place of business, San Francisco, California. Location of Railroad, Alameda County, California.
NOTICE is hereby given that at a meeting of the Board of Directors, held on the 3d day of August, 1889, an assessment, No 1, of Fifty Cents per share was levied upon the Capital Stock of the corporation, payable immediately in United States Gold Coin to the Secretary at the office of the Company, Room 12, No. 320 California Street, San Francisco, California.
Any stock upon which this assessment shall remain unpaid on the 20th day of September, 1889, will be delinquent and advertised of sale at public auction, and unless payment is made before, will be sold on Monday, October 14th, 1889, to pay the delinquent assessment, together with costs of advertising and expenses of sale.
By order of the Board of Directors.
E. A. PHELPS, Secretary.
Office, Room 12, No. 320 California Street, San Francisco, California.

ASSESSMENT NOTICE.

Gray Eagle Mining Company.—Location of Principal place of Business, San Francisco, California. Location of Works, Placer County, California.
NOTICE is hereby given that at a meeting of the Board of Directors, held on the 13th day of August, 1889, an assessment, No. 14, of Four Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin, to the Secretary, at the office of the Company, 327 Pine Street, Room 9, San Francisco, California.
Any stock upon which this assessment shall remain unpaid on the 16th day of September, 1889, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 8th day of October, 1889, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.
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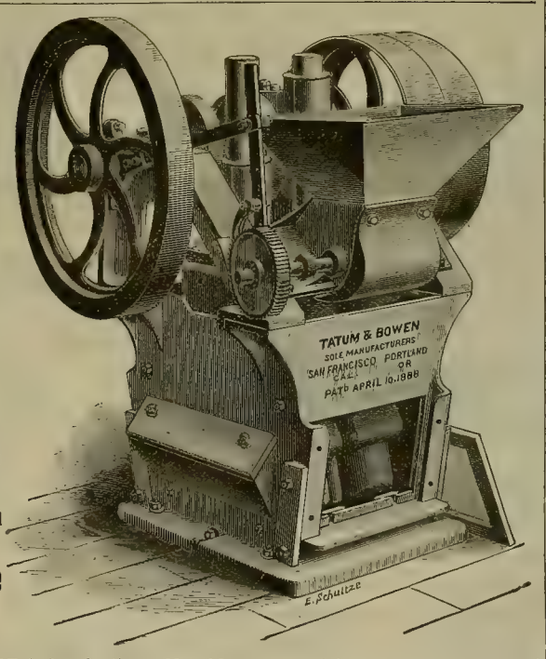
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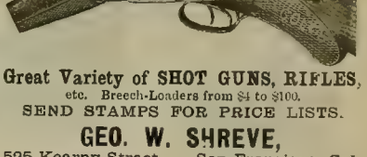
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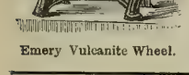
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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

From the official report of U. S. Patents in DEWEY & CO.'s Patent Office Library, 220 Market St., S. F.

FOR WEEK ENDING AUGUST 27, 1889.

409,901.—WHEEL-GUARD FOR STREET CARS—G. H. Bahrs, S. F.

409,826.—COPYING-SHEET—H. W. Brown, Oakland, Cal.

409,926.—CABLE RAILWAY—Clement & Watriss, S. F.

409,946. — BAG-HOLDER — John Fees, French Camp, Cal.

409,835. — FIRE-LADDER TRUCK — J. E. Furry, Stockton, Cal.

409,063.—STOP MECHANISM FOR SEWING MACHINES—A. J. Hart, S. F.

409,792. — FURNACE — E. W. Jones, Portland, Ogn.

409,687.—OX-YOKE—W. Kidd, Fisherman's Bay, Cal.

409,980.—BELLOWS—H. Kohn, S. F.

409,995.—SPEED-CONTROLLING DEVICE FOR ELEVATORS—T. H. Melrose, S. F.

409,861.—SAFETY-GUARD FOR CARS—Chas. H. Ohm, S. F.

409,865.—WATER-WHEEL — L. A. Pelton, Nevada City, Cal.

409,868.—SOD-CUTTER—L. T. Price, Endicott, W. T.

409,884.—SCHOOL DESK—Chas. B. Towle, Vallejo, Cal.

410,062. — CABLE RAILWAY CROSSING — G. H. Wright, S. F.

The following brief list by telegraph, for Sept. 3d will appear more complete on receipt of mail advices:

California—Walker C. Taylor, San Francisco, merry-go-round; Edward A. Rix, San Francisco, rock drill; Ernest L. Ransome, San Francisco, concrete-mixing machine; Parker J. Pierce, assignor of half to R. P. M. Greely, Oakland, cuspidor; James M. Jameson, Los Angeles, device for burning brick; David B. James, San Francisco, miner's candle-stick; Frederick W. Cook, assignor of half to H. P. Gregory & Co., San Francisco, gang-edger; Joseph S. Chadbourne and L. C. Stuckey, Rosamond, railway rail joint; Daniel Best, San Leandro, combined harvester and thrasher.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

FIRE-LADDER TRUCK. — John E. Furry, Stockton, No. 409,835. Dated Aug. 27, 1889. This is one of that class of fire-ladder trucks in which the main ladder is hinged to a turn-table and is adapted to be raised by suitable power-transmitting mechanism. The invention consists in the novel manner of mounting the ladder, the novel mechanism for raising and lowering it and the mechanism for turning it to the required position. The object is to provide a simple arrangement for handling the main ladder of a fire-truck, one man only being required to manipulate it, both to raise and lower it and to turn it to required position.

SCHOOL DESK.—Charles B. Towle, Vallejo, Solano Co. No. 409,884. Dated Aug. 27, 1889. The objects of this invention are to provide simple, effective and accurate connections between the sliding and the fixed top of the desk, whereby a suitable space may be formed between the two tops, and whereby the former may be readily moved and limited in its movement; to provide a simple seat connection whereby the seat may be raised and lowered; to provide suitable connections for the foot-rest whereby said foot-rest may be readily put in place and adjusted to different positions and to different angles; and to provide a simple seat hinge.

SAFETY-GUARD FOR CARS.—Chas. H. Ohm, San Francisco, No. 409,861. Dated Aug. 27, 1889. This is a protective device to be applied to the front of cable railroad cars to prevent persons and things from being carried beneath the wheels. The essential feature of this invention is a swivelled roller-guard so suspended that if a body comes in contact with it it will turn from one side or the other so that the frictional contact of the body, which is still resting upon the ground, will cause the rollers to act upon it and force it off to one side and away from the car-wheels, while at the same time the secondary guard or scraper will be thrown down into such close contact with the track and road-bed as to prevent anything passing beneath it.

THREAD CONTROLLED STOP MECHANISM FOR SEWING MACHINES.—Albert J. Hart, S. F. No. 409,963. Dated Aug. 27, 1889. This invention relates to the mechanisms of sewing machines for stopping the motion of the machine, and dependent for their operation upon the breaking of the thread, whereby the result is automatically effected. The invention consists in a movable trip-rod held in one position normally by the thread when taut, and allowed to drop when the thread is broken; a belt-shifting arm directing the power belt and adapted to throw it from a fast to a loose pulley; a spring-controlled sliding bar carrying the belt-shifting arm and a locking lever for holding the sliding bar in position when the machine is in operation, said lever being released by the trip-rod when dropped upon the breaking of the thread; and the invention further consists in connection with the belt-shifting arm of a brake attachment adapted to come into frictional contact with the fast pulley, whereby it checks its momentum instantly. This provides a simple and effective mechanism for automatically stopping the motion of a sewing machine upon the breaking of the thread.

WATER-WHEEL.—L. A. Pelton, Nevada City, assignor to A. P. Brayton, Jr., San Francisco. No. 409,865. Dated Aug. 27, 1889. This is an improvement on the well-known Pelton wheel. The invention consists essentially in a novel construction of the buckets into which the water is discharged so that the stream of water is divided into two parts by a central ridge or apex which directs the current of water into the curved bottom of the two halves of the bucket, from which it passes out over the flaring or diverging sides of the bucket so as to escape smoothly and utilize the full reactionary force of the escaping stream in addition to the direct force of the impinging jet. The object of the improvement is to provide a series of buckets to be attached to the periphery of water-wheel, these buckets being of such construction as to utilize to its highest degree, first, the direct impact of the column of water which is discharged into them with great velocity from the nozzle, and, secondly, to utilize in a similar manner the full reactionary force caused by the change of direction of the column of water and its perfect discharge and clearance from the wheel, so that no portion of it acts to impede the wheel by contact with the following buckets or any other portion of the wheel.

The Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

	Cash.	Debt.
Alta	$14,566	$.....
Alpha	22,172	.....
Andes	21 481	.....
Bodie Con	30,077	.....
Benton Con	85,000	.....
Belcher	.....	21,815
Belle Isle	.....	822
Best & Belcher	179	.....
Bulwer	342	.....
Bullion	7,847	.....
Challenge Con	.....	.....
Caledonia	9,729	.....
Chollar	3,648	.....
Con. Cal. & Virginia	*115,392	.....
Confidence	11,549	.....
Con. Imperial	3,953	.....
Con. New York	.....	348
Commonwealth	10,473	.....
Crocker	6,313	.....
Crown Point	.....	14 956
Del Monte	.....	6,212
Diana	4 388	.....
East Sierra Nevada	165	.....
Exchequer	13 573	.....
Gould & Curry	9,657	.....
Grand Prize	.....	532
Hale & Norcross	15,846	.....
Holmes	.....	4,810
Independence	3,032	.....
Justice	3,869	.....
Kentuck	.....	1 261
Lady Washington	21,767	.....
Locomotive	2,593	.....
North Belle Isle	.....	10 273
North Commo wealth	.....	6,220
Mexican	19,163	.....
Mono	24,607	.....
Navajo	.....	12,767
Occidental	†.....	1 959
Ophir	29,161	.....
Overman	23,082	.....
Peer	495	.....
Peerless	4,382	.....
Potosi	.....	18,550
Savage	.....	14 416
Scorpion	240	.....
Seg. Belcher & Mides	.....	15 051
Silver Hill	11 873	.....
Sierra Nevada	9,576	.....
Silver King	26 158	.....
Standard	6,464	.....
St Louis	1,037	.....
Syndicate	8,140	.....
Union Con	6,829	.....
Utah	14,391	.....
Weldon	6,572	.....

*There is in unsold bullion $74,196, with further shipments on August accoun to hear from.
†Bullion on hand value not known.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

FREEMAN'S DRY WASHER is attracting considerable attention at the Mechanic's Fair. A public test was made on Monday last which was very satisfactory. We have described this machine in detail in the PRESS, and since that a number have been put at work in the dry placers on different parts of this coast.

DODGE, NOT HUNTINGTON. — The Amador county papers persist in calling the ore pulverizer at work at the French, or Cleveland mine, a Huntington mill, whereas it is a pulverizer of the Dodge patent.

THE town of Barker, the business center of Barker mining district, Montana, has been almost totally destroyed by fire.

E. E. EYRE, President. JAS. H. GRAHAM, Vice-Pres. & Manager. G. M. PINCKARD, Sec'y.

VULCAN IRON WORKS,

135 to 145 Fremont Street, San Francisco, Cal.

MINING MACHINERY,

Stamp Batteries, Pans, Settlers, Etc. "Dodge" Rock Breakers, Pulverizers, Concentrators.

SAWMILL MACHINERY,

Refrigerating and Ice Machinery, Cable-Road Machinery,

STEAM ENGINES,

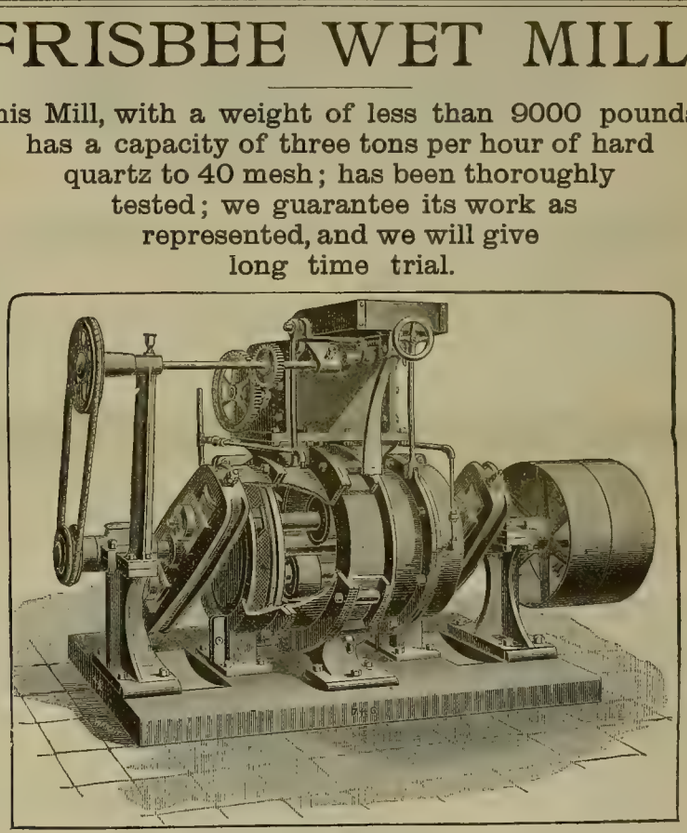
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Shafting, Pulleys, Hanger and Boxes, Etc.

Special machinery of all kinds. We have a large list of Standard Patterns, Gears, Pulleys, Boxes, etc. REPAIR WORK SOLICITED.

FRISBEE WET MILL.

This Mill, with a weight of less than 9000 pounds, has a capacity of three tons per hour of hard quartz to 40 mesh; has been thoroughly tested; we guarantee its work as represented, and we will give long time trial.



IT HAS NO MORE WEARING PARTS THAN CORNISH ROLLS,

And renewals will not cost over one-half as much as for stamps. Will run empty, or with small amount of ore without injury. The attention of parties having Cement Gravel is called to this Mill, as it will run 100 tons per day to No. 8 mesh; 30 to 35 H. P.

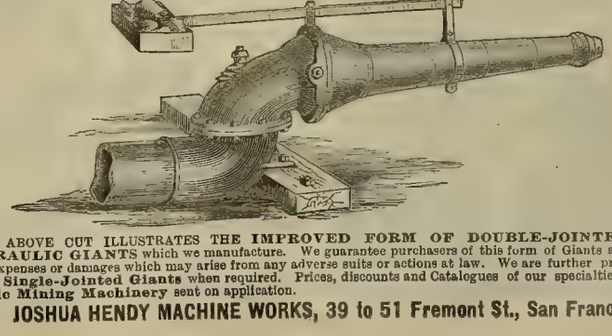
OUR DRY MILLS are the most economical ever built, and are extensively used with record of several years. No grinding in pans. Mill finishes to any fineness desired.

FRISBEE-LUCOP MILL COMPANY.

GIDEON FRISBEE, Manager, - - 59 & 61 First Street, San Francisco

HOOKER & LAWRENCE, Gen'l Ag'ts, 145 Broadway, New York.

IMPROVED FORM OF HYDRAULIC GIANTS.



THE ABOVE CUT ILLUSTRATES THE IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture. We guarantee purchasers of this form of Giants against all costs, expenses or damages which may arise from any adverse suits or actions at law. We are further prepared to furnish **Single-Jointed Giants** when required. Prices, discounts and Catalogues of our specialties of **Hydraulic Mining Machinery** sent on application.

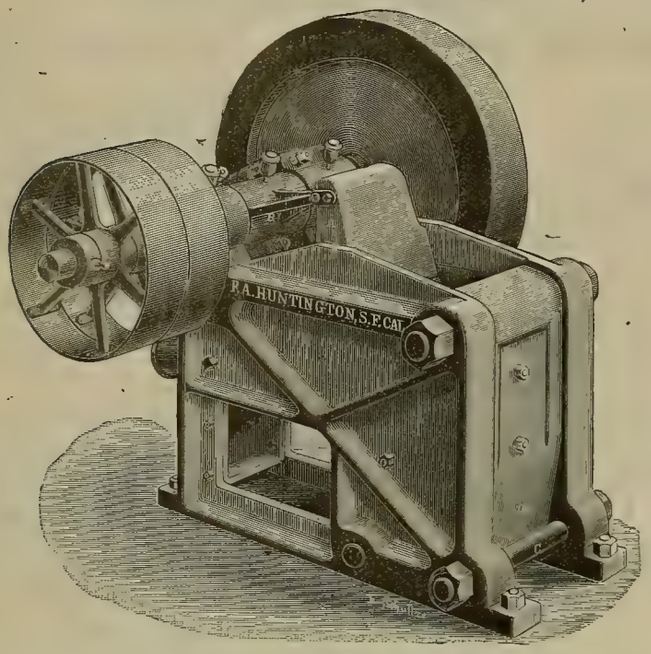
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STEAM ENGINES AND MINING MACHINERY OF EVERY DESCRIPTION.

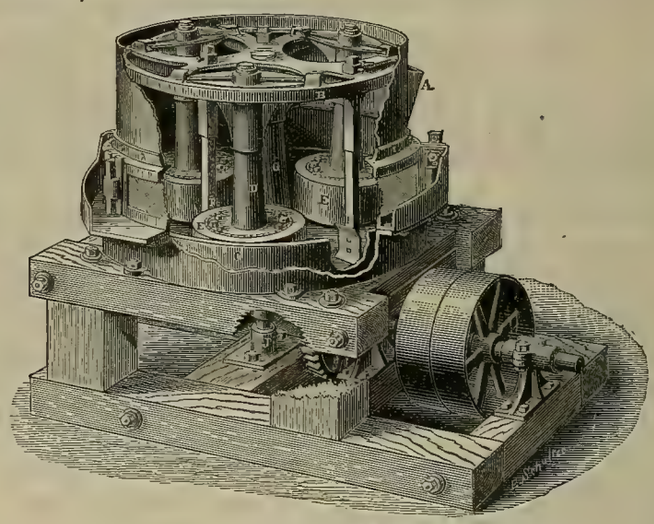
PRINCIPAL OFFICE, 213 FIRST STREET, SAN FRANCISCO.



Huntington's Improved Rock-Breaker.

The main features of this machine are strength, ease of adjustment and simplicity of construction.

The movable jaw *A* is worked by the eccentric *B* and is pivoted at the bottom. The stationary jaw *D* is secured at the top by a bolt running through it, and at the bottom bears against the heavy bolt *C*. The main wear is, of course, at the bottom of a breaker of this form, and the wear is easily taken up by inserting a plate between the bolt *C* and the jaw *D*. The jaw is thus swung in at the bottom, and the opening where the ore passes through is made correspondingly smaller. As will be seen by the cut, this machine is of very simple construction and is strong and durable.



F. A. HUNTINGTON'S
Centrifugal Roller Quartz Mill.

The following will explain the above cut:

The ore and water being fed into the mill at the hopper *A*, the rotating rollers and scrapers throw the ore against the ring die, where it is crushed to any desired fineness by the centrifugal force of the rollers as they roll over it.

The water and pulverized ore are thrown against and through the screens when fine enough. The discharge is so perfect that it makes little or no slimes, and leaves the pulp in good condition for concentration. The rollers are suspended, leaving a space of one inch between them and the bottom of the mill, thus allowing them to pass freely over the quicksilver and amalgam without grinding it or throwing it from the mill, while it agitates it sufficiently to make amalgamation perfect. For wet crushing and gold saving it has no equal.

I claim especial merit in that feature of this system *which prevents* ALL FLOURING of gold and quicksilver, and the consequent loss of gold that attends stamp milling.

For the economical working of ore that contains sulphurets, I particularly claim the adaptation of this mill. The rotary method of crushing the ore so granulates the pulp (which is discharged the moment it is crushed) that a complete concentration of sulphurets is rendered most easy.

FREEMAN'S
Dry Process
GOLD SEPARATOR.

They are good machines. If the gold is in the dirt they will save it. They will save finer gold than water will.

T. J. SCOTT,
Osceola, Nevada.

Smith & Drew took out Tuesday, in their dry wash diggings, in addition to 5 ozs. of fine gold, a nugget weighing 22 ozs. The machine used was Freeman's Dry Process Separator.—*Utah Daily Union, May 10, 1889.*

☞Send for descriptive Circular and Price List.

JAS. B. FREEMAN,
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LOS ANGELES, CAL.



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To Run your Mills, Hoists and Trams.

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Chrome Cast Steel for Rock Drills, Etc.



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Special attention given to purchase of

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ADAMANTINE SHOES AND DIES.—Guaranteed to prove better and cheaper than any others. Orders solicited, subject to above conditions.
H. D. MORRIS.

AMALGAMATING MACHINERY.

Stamp Mills for Wet or Dry Crushing. Huntington Centrifugal Quartz Mill. Drying Cylinders. Amalgamating Pans, Settlers, Agitators and Concentrators. Retorts, Bullion and Ingot Moulds, Conveyors, Elevators, Brucknere and Howell's Improved White's Roasting Furnaces, Etc.

FRASER & CHALMERS, MINING MACHINERY

CONCENTRATING MACHINERY.

Blake, Dodge and Comet Crushers, Cornish Crushing and Finishing Rolls, Hartz Plunger and Collom Jigs. Frue Vanner & Embrey Concentrators, Evans', Calumet, Collom's and Rittenger's Slime Tables. Trommels, Wire Cloth and Punched Plates. Ore Sample Grinders and Heberle Mills.

IMPROVED CORLISS AND SLIDE VALVE STEAM ENGINES. ❋ BOILERS HORIZONTAL, VERTICAL ... AND SECTIONAL....

IMPROVED STEAM STAMPS

Hoisting Engines, Safety Cages, Safety Hooks,

ORE CARS, WATER & ORE BUCKETS,

Air Compressors, Rock Drills, Etc.

GENERAL MILL AND MINING SUPPLIES, ETC.

Sectional Machinery FOR MULE-BACK TRANSPORTATION.



Pumping Engines and Cornish Pumping Machinery,

IMPROVED WATER JACKET

Blast Furnaces for Calena & Copper Ores,

SLAG CARS AND POTS,

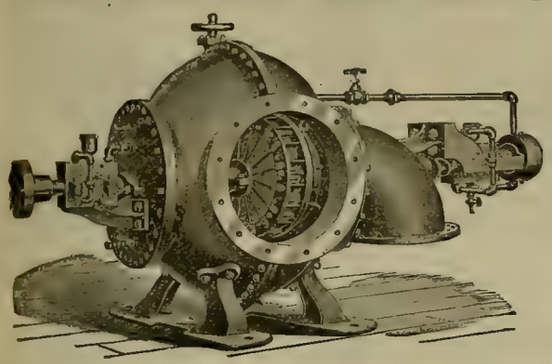
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JAMES LEFFEL'S Mining Turbine Water Wheel.

These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

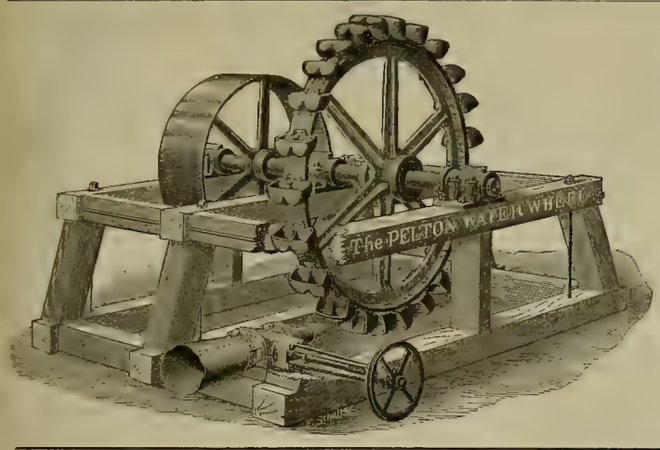
Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

JAMES LEFFEL & CO.,
Springfield, Ohio, or 110 Liberty St., New York.

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THE PELTON WATER WHEEL

GIVES THE

Highest Efficiency of any Wheel in the World.

A MARVEL OF ENERGY AND POWER.

Over 600 in use on the Pacific Coast alone, aggregating upwards of 50,000 Horse Power.

It is not only most economical of water, but the most simple and reliable power for Quartz Mills, Compressors, Hoisting, Pumping, or any other purpose where water power can be used.

ELECTRIC TRANSMISSION.

Power from these Wheels can be transmitted long distances with small loss, and it is now being extensively used in this way in all parts of the country for producing both light and power.

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THE PELTON WATER WHEEL CO.,
120 First Street, - - San Francisco, Cal.

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HENRY J. ROGERS & CO.

Successors to CHAS. CALLAHAN

IMPORTERS AND DEALERS IN

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Of every description.

The Highest Price paid for all kinds of Metals.

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Sheet Iron and Steel Pipe

ALL SIZES.

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Iron cut, punched and formed, for making pipe on ground All kinds of Tools supplied for making Pipe. Estimates given. Are prepared for coating all sizes of Pipe with a composition of Coal Tar and Asphaltum.

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Extra sizes and lengths made to order on short notice.

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THOMAS PRICE & SON,

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BULLION ROOMS and ORE FLOORS,

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COIN RETURNS ON ALL BULLION DEPOSITS IN 24 HOURS.
WORKING TESTS OF ORES BY ALL PROCESSES.
SPECIAL ATTENTION PAID TO CONCENTRATION OF ORES.

Ores Received on Consignment, Sampled, Assayed, and Disposed of in the Open Market to the Highest Bidder.

Metallurgy and Ores.

SELBY SMELTING and LEAD CO.,

416 Montgomery St., San Francisco.

GOLD AND SILVER REFINERY And Assay Office.

Highest Prices Paid for Gold, Silver and Lead Ores and Sulphurets.

....MANUFACTURERS OF....

BLUESTONE, LEAD PIPE, SHEET LEAD, SHOT, Etc., Etc.

ALSO MANUFACTURERS OF

Standard Shot-Gun Cartridges,

Under Chamberlin Patent.

JOHN TAYLOR & CO.,

IMPORTERS AND DEALERS IN

ASSAYERS' MATERIALS, MINE AND MILL SUPPLIES,

ALSO CHEMICALS, AND PHYSICAL, SCHOOL AND CHEMICAL APPARATUS.

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We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price. Our New Illustrated Catalogue, with prices, will be sent on application.

☞ Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England. Also for E. G. DENNISTON'S Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices.

JOHN TAYLOR & CO.

Nevada Metallurgical Works.

NO. 23 STEVENSON STREET,
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Ores worked by any Process.
Ores Sampled.
Assaying in all its Branches.
Analyses of Ores, Minerals, Waters, etc.
Working Tests (practical) Made.
Plans and Specifications furnished for the most suitable Process for Working Ores.
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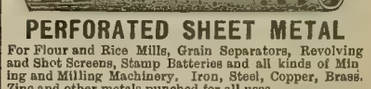
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Best and Cheapest in America.

No imitation, no deception, no planished or rotten iron used. Only genuine Russia iron in Quartz Screens. Planished iron screens at nearly half my former rates.

I have a large supply of Battery Screens on hand suitable for the Huntington and all Stamp Mills, which I will sell at 20 per cent discount.



PERFORATED SHEET METAL

For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass, Zinc and other metals punched for all uses.

Inventor and Manufacturer of the celebrated Slot Cut burred and Slot Punched Screens.

Mining Screens a specialty, from No. 1 to 15 (fine).

Orders promptly attended to.

San Francisco Pioneer Screen Works,

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JOHN W. QUICK, Proprietor.

This paper is printed with Ink Manufactured by Charles Eneu Johnson & Co., 500 South 10th St., Philadelphia. Branch Offices—47 Rose St., New York, and 40 La Salle St., Chicago. Agent for the Pacific Coast—Joseph H. Dorety, 529 Commercial St., S. F.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Sept. 5, 1889.

General trade continues fair, but the volume of goods going out is disappointingly small for the season of the year; yet this is to be expected as transportation facilities improve so as to admit of assorting buying the year round. Merchants still complain of poor collections, but freer remittances are looked for in the near future. Manufacturers and iron-workers in general report a fairly active business in their particular lines.

The local money market is easy, with no marked call for funds. The first installment of money from Australia, mentioned by this paper in July last, came to hand the past week. The shipment aggregated $5,000,000, which went into the mint for recoinage. The money is sent here for exchange purposes on grain purchases, and will do no little in keeping our money market easy throughout the months when the demand is the heaviest for funds to move the grain crops. For speculative purposes there is only a moderate call for money. The only movement that now promises any inducements for an active speculative campaign is that of wheat and barley. Local securities, unless we except Spring Valley stock, are too high for dealers. Mining stocks appear to be getting into shape for an active bull campaign, which would draw in outside speculators.

The coinage of the San Francisco Mint in last month was as follows: Double eagles, $2,000,000; eagles, $630,000; total, $639,000.

The London silver market for August showed an irregular tendency. The opening price was 42¾d for British standard ounce 925 fine. The price rose to 42¾d, then dropped to 42¾d, but rose irregularly to 42 9-16d on the 30th, and closed at 42½d. The extremes for each month this year have been as follows:

	Highest.	Lowest.
January	42 11-16d	42 6-16d
February	42 12-16	42 8-16
March	42 9-16	42 4-16
April	42 5-16	42 2-16
May	42 4-16	41 15-16
June	42 4-16	42 0
July	42 5-16	42 0
August	42 9-16	42 3-16

The extremes for August, 1888, were 42 2-16d and 41 15-16d, and for the eight months 44 11-16d to 41⅝d.

S. H. Brooks, Assistant Treasurer United States at San Francisco, reports cash on hand Aug. 31, 1889, as follows:

United States notes	$95,272 00
National Bank notes	20,075 00
Gold certificates	4,560 00
Silver certificates	107,465 00
Gold coin	39,364,371 50
Standard silver dollars	17,992,241 00
Fractional silver	6,578,746 75
Minor coin	3,319 59
Total	$64,166,050 84

The shipments of silver from the Sub-Treasury into the interior of the State and elsewhere for the month were as follows:

Standard dollars	$238,130 00
Fractional silver	100,280 00
Total	$338,410 00

MEXICAN DOLLARS—The market was held fairly strong throughout the past week at 74¾c to 74½c. The demand is fairly good. The steamer leaving here on last Saturday for China took out for Hongkong $250,030 and to Japan $5000. Total, $255,030.

SILVER—The market was held strong throughout the week. On last Friday the highest point was reached; since then the price shaded off some. The last sale reported was made at 93¾c, although holders ask more money. The Nevada bank was in the market for last steamer; their purchases went forward to Shanghai. The supply of silver bullion on this coast is light, which causes our market to rule from three-fourths to one cent an ounce above New York quotations. It now looks as if the supply from the Comstock mines will continue small, as all indications point to new developments being mostly gold. The steamer hence, Aug. 31st, for China, took out bullion as follows: For Hongkong, $122,000; Japan, $41,000; Shanghai, $49,592. Total, $212,592.

QUICKSILVER—Receipts the past week aggregate 394 flasks and the shipments by sea, 90 flasks to Mexico. The market has an easier tone. The call is still quiet.

BORAX—Receipts the past week aggregate 873 ctls., and the shipments 4013 ctls. to New York. The market is firm at full prices, with the East buying freely.

LIME—Receipts aggregate 5084 bbls. The export movements continue small, but the home demand is still free.

TIN—Exports by sea the first week aggregate 30,000 pounds to Victoria, B. C. The market for spot parcels is quiet with an easy tone reported by buyers. For shipment the market is very strong at full prices.

COPPER—A shipment of 18 bars was made the past week to Hamburg. The market both at the East and abroad continues to shape itself in sellers' favor.

IRON—The spot market has a firmer tone, with present indications pointing to an advance in the near future. For shipment no orders can be filled except at a marked advance on spot quotations. The market abroad has advanced to figures that necessitate caution. At the East there is an improved market.

The following are the latest comparative quotations f. o. b. at Glasgow:

F. o. b. Glasgow.	Aug. 28, '89.	Aug. 21, '89.
No 1 Coltness	61s	60s
" Langloan	59s 6d	58s 6d
" Summerlee	59s 9d	58s 6d
" Gartsherrie	58s 6d	57s
At Ardrossa.		
No. 1 Eglinton	47s 6d	47s 6d
" Glengarnock	56s	55s
" Dalmellington	49s	49s 6d

COKE—Imports the past week aggregated 1000 tons from Australia. The market with us is without change. It is claimed that concessions can be had from consumers who have large supplies on hand.

COAL—Imports the past week aggregate as follows: Australia, 11,656 tons; Nanaimo, 2336; Coos Bay, 1215; Seattle, 5950; Departure Bay, 3782; Union Bay, 4300; Tacoma, 2000; total, 31,190 tons. Although imports the past week show an increase, yet the market is reported very strong at full prices. The scarcity of ships at all supply ports is against buyers. The demand is reported by importers and agents to be increasing. The coast collieries are said to be increasing their output under the impression that the market will probably do better.

Eastern Metal Markets.

By Telegraph.

NEW YORK, Sept. 4, 1889.—The following are the closing prices the past week:

	Silver in London.	New York.	Copper.	Lead.	Tin.
Thursday	42½	92½	$12 00	$3 85	$20 50
Friday	42 9-16	92⅜	12 00	3 87½	20 50
Saturday	42⅜	92⅜	12 00	3 90	20 50
Monday	42⅜	....	....	....	....
Tuesday	42⅜	92½	12 00	3 95	20 50
Wednesday	42⅜	92½	12 00	4 00	20 55

NEW YORK, Sept. 4.—Quicksilver is easier. Borax is firmly held with a good demand. The copper combination maintains its views to an extent that supports $12 for Lake Superior, $11.50 Montana and Arizona. Casting brands $10.50 to sell. Pig lead strong at $3.97½@$4, with sales about 400 tons per week.

San Francisco Metal Market.

WHOLESALE.
THURSDAY, September 5, 1889.

ANTIMONY	17 @	—
BORAX—Refined, in carload lots	7¼@	7⅞
Powdered " " "	7¼@	—
Concentrated " " "	— @	6¾
All grades jobbing at an advance.		
COPPER—		
Bolt	21 @	22
Sheathing	22 @	24
Ingot, jobbing	15 @	16
do, wholesale	13@	14
Fire Box Sheets	22 @	24
LEAD—Pig	4 ½@	—
Bar	5 @	—
Sheet	7 @	—
Pipe	6 @	—
Shot, discount 10% on 500 bags Drop, ₰ bag	1 45 @	—
Buck, ₰ bag	1 65 @	—
Chilled, do	1 85 @	—
STEEL—English, ₰	16 @	20
Canton tool	9 @	9½
Black Diamond tool	9 @	9½
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4 3@	—
TINPLATE—B. V., steel grade, 14x20, P. S	4 80 @	—
B. V., steel grade, 14x20, spot	4 85 @	—
Charcoal, 14x20	6 25 @	6 75
do roofing, 14x20	5 12½@	5 25
Pig tin, spot, ₰ lb	21 @	21½
do, do, prompt shipment	— @	—
QUICKSILVER—By the flask	46 50 @	47 50
Flasks, new	@	—
Flasks, old	38 @	—

	Spot.	To Load.
IRON—Glengarnock ton	27 00 @—	27½@ —
Eglinton, ton	26 00 @—	26½@ —
American Soft, No. 1, ton	— @31 00	31½@ —
Oregon Pig, ton	— @30 00	— @ —
Clay Lane White	— @24 50	25 @ —
Shotts, No. 1	28 50 @29 00	— @ —
Bar Iron (base price) ₰ lb	2½@ 3	— @ —
Chrome iron ore, ₰ ton	— @10 00	— @ —

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$19 00	$16 00
41 to 50 ft	20 00	17 00
51 to 60 ft	22 00	19 00
61 to 70 ft	26 00	22 00
1x3, fencing	21 00	18 00
1x4, "	20 00	17 00
1x3, 1x4 and 1x6, odd lengths	18 00	15 00
Second quality	16 00	14 00
Selected	23 00	21 00
Clear, except for flooring	30 00	27 00
Clear for flooring	1 00	.....
Clear V. G. No. 1 flooring	5 00	.....
Firewood	13 00	9 00
Dressed Pine, flooring, No. 1, 1x6	31 00	28 00
No. 1, 1x4	33 00	29 00
No. 1, 1¼x4, 1¼x6, and odd sizes	36 00	32 00
All sizes, No. 2	26 00	23 00
Stepping, No. 1	43 00	34 00
Stepping, No. 2	33 00	24 00
Ship timber and plank, rough	26 00	17 00
Selected, planed 1 side, average 40 ft	28 00	23 00
" " 2 " " "	30 00	25 00
" " 3 " " "	32 00	27 00
" " 4 " " "	34 00	29 00
Deck plank, rough, average 35 ft	34 00	31 00
Dressed, average 35 feet	39 00	34 50
Pickets, rough, B. M	19 00	15 00
½x1½, 4 ft long, ₰ M	5 50	4 00

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	$ 7½ @ 7½	Cardiff	50@10 00
Liverpool St'm	7 50 @ 7 75	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	8 00 @ 8 50	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Gilman	6 00
Scotch Splint	9 00	Seattle	6 00
West Hartley	11 00	Coos Bay	5 00
Greta	8 00	Cannel	10 00
Westminster Brymbo	9 00	Egg, hard	17 50
Nanaimo	9 00	Cumberland, in sacks	19 00
Sydney	8 00	do, bulk	18 00
Jackson	6 00		

COKE—Eng., ton, spot, in blk & sks, resptvly | 17 00 @20 00
Do, do, to load | 13 00 @13 25

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Mt Diablo, Sept. 5 $8584; Justice, 5, $8306; Bluebird, Aug. 28. $19,056; Lexington, 30, $19,488; Ely, 28, $2000; Cons. Cal. and Virginia, 31, $74,196; Occidental, Sept. 3, $4670; Hanauer, Aug. 28, $2775; 29, $2000; Mt. Diablo, 31, $10,219; Hanauer, 30, $4800; 31, $1900; Sept. 1, $2750.

THE *Territorial Enterprise* says: The steam road-wagons are hauling lumber from Dog Valley to Verdi. They make the round trip—30 miles—in two days, each steam-wagon hauling five wagons loaded with 4000 feet of lumber.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Argenta M Co	Nevada	19	10	July 20	Aug 21	Sept 16	E M Hall	314 Montgomery St
Alpha Con M Co	Nevada	3	25	July 15	Aug 22	Sept 12	C E Elliott	309 Montgomery St
Bulwer Con M Co	California	6	25	Aug 6	Sept 12	Oct 10	L Osborn	309 Montgomery St
Calaveras Blue Gravel M Co	Cal	3	3	Aug 3	Sept 16	Oct 2	B Burris	240 Montgomery St
Challenge Con M Co	Nevada	5	50	Aug 6	Sept 9	Sept 30	C L McCoy	329 Pine St
Chollar M Co	Nevada	37	85	July 15	Aug 20	Sept 10	C E Elliott	309 Montgomery St
Con New York M Co	Nevada	1	25	Aug 14	Sept 15	Oct 9	C E Elliott	309 Montgomery St
Del Norte Gravel M Co	California	2	7	Aug 24	Oct 3	Oct 26	J B Cronan	230 Montgomery S
East Mt Diablo M Co	California	5	10	July 18	Aug 22	Sep 16	R W Heath	318 Pine St
East Sierra Nevada M Co	Nevada	1	10	Aug 8	Sept 13	Oct 7	G R Spinney	310 Pine St
Gray Eagle M Co	California	14	4	Aug 13	Sept 16	Oct 8	O H Bogart	317 Pine St
Golden Fleece G'd M Co	California	14..17	00	May 21	July 20	Sep 16	W J Gleason	306 Market St
Grand Prize M Co	Nevada	21	30	July 27	Aug 30	Sep 20	E E Grayson	327 Pine St
Kentuck M Co	Nevada	19	30	July 30	Sept 2	Sep 20	J W Pew	310 Pine St
Keyes M Co	Nevada	4	30	Aug 27	Oct 1	Oct 21	J H Sayre	328 Montgomery St
Mineral King M & M Co	Arizona	3	10	Aug 22	Sept 24	Oct 21	P H Leonard	419 California St
Mono M Co	California	28	50	July 24	Aug 23	Oct 1	B L Burling	309 Montgomery St
Overman S M Co	Nevada	60	25	July 27	Aug 30	Sep 20	G D Edwards	414 California St
Peer M Co	Arizona	8	10	Sept 4	Oct 10	Nov 5	A Waterman	309 Montgomery St
Palesade S M Co	Nevada	1	10	Aug 6	Sept 16	Oct 2	D Buck	309 Montgomery St
Savage M Co	Nevada	73	50	July 19	Aug 21	Sep 10	E B Holmes	309 Montgomery St
Scorpion M Co	Nevada	1	10	Aug 8	Sept 13	Oct 7	G R Spinney	310 Pine St
Southern Cal Coal & Clay Co	Cal	2..10	30	Aug 16	Sept 16	Oct 16	W G Mugan	10 California St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING	DATE
Hector M Co		J B Hughes	517 Clay St	Annual	Sept 9
Occidental M Co	Nevada	W H Watson	302 Montgomery St	Annual	Sept 10

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Caledonia M Co	Nevada	A S Cheminant	328 Montgomery St	08	Aug 5
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	Sept 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	July 25
Idaho M Co	California		Grass Valley	7.50	May 5
Navajo M Co	California	J W Pew	310 Pine St	10	Apr 1
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Aug 10

Mining Share Market.

As intimated in last week's issue the pool made the smaller shorts on the Comstocks fill by a slight upward turn in prices; after which the market sagged off up to Wednesday, when a strong bear raid was made on the north end stocks. One firm alone put out over 3000 shares, while others put out smaller quantities. After the tone of the market became unmistakably weak by having absorbed all the stock possible, a broker who is reported to be acting for the pool, commenced offering stocks, when a scramble from outside holders and the raid set in to get out. Who bought the stock is a problem, for outsiders who have faith in the situation were well loaded up and could take no more, while others who have either been acting on the bear side or else not doing anything, seemingly watching for developments, were not purchasers. There is no doubt but the work now going on in the Middle, Gold Hill and Alta group of mines is of a very interesting character, and that important ore bodies or lodes known to the best recognized mining experts are liable to be run into within a short time. In outside stocks trading was fair in the Quijotoas and Bodies at a slight advance, but which was soon lost. Report has it that the Quijotoas, which are the most economically managed mines listed on the two exchanges, are to have another line of assessment in the near future. The Bodie 50-cent assessment has not been levied, but instead a report of a strike in Mono was put out, but which our advices so far fail to confirm. The Tuscaroras are lifeless and unattractive, pending some kind of improvements in the mills and active prospecting work in the mines.

Col. John W. Mackay is expected back from the East soon. It is said that it has always been his custom to be here at the annual meeting of Con. Virginia, which is held on the second Monday of October. This year it is intimated by one or two persons who ought to know that there may possibly be a contest for the control of the mine. So far the market acts as if there are grounds for the rumor, but like all else, time will tell if the report is correct.

The market for the Comstocks opened this (Thursday) morning at lower prices. After the regular session prices were a shade firmer. The market indicates that the pool is shaping things for another upward move, probably by the time this paper reaches our patrons it may have commenced, and this, too, in the face of reports of assessments to be levied soon. Outside stocks continue inactive.

Private, but reliable, information from the Comstock mines report that the west crosscut on the 500-foot level in Yellow Jacket is in 575 feet, and is being vigorously pushed forward so as to cut the gold ledge lying to the west. A crosscut on the same level in Challenge is in 120 feet. Con. Imperial north drift, continuation of the 500-foot level from the Yellow Jacket shaft, is close to the Alpha line. The Alpha shaft is being sunk below the 500-foot level to get deeper on the ledge cut on the 500-foot level to the west. In Potosi they are still stripping the ledge on the 700-foot level at the south end of the mine. The Ward shaft is opened to the 1700-foot level. In Crown Point they have found favorable indications of the ledge pitching west on the 400-foot level. This is important, as the ledge is much flatter and further west than the management had expected. Belcher is upraising from the 1200-foot level in low-grade ore. On the 200-foot level they are crosscutting now in quartz and porphyry. The north drift from crosscut No. 1 in Mexican is in over 300 feet with no improvement reported so far. In the Gould and Curry and Best and Belcher drifts there is nothing new to report. In Savage they are finding on the 300-foot level ore west of the water encountered last week. In Hale and Norcross on the 300-foot level they are ready to commence crosscutting from the Savage to Chollar line. From the outside mines, Bodies, Tuscaroras, and Quijotoas there is nothing new to report from trustworthy sources.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. C. HOAG—San Francisco.
R. G. BAILEY—San Francisco.
W. W. THEOBALDS—Central California.
GEO. WILSON—Sacramento Co.
E. H. SCHAEFFLE—Calaveras Co.
DR. W. F. DRAKE—Sonora, Cal.
A. F. JEWETT—Tulare Co.
ROBERT M. MAPPES—Fresno Co.
E. L. RICHARDS—San Diego Co.
WM. WILKINSON—San Joaquin Co.
JULES BAUMANN—Arizona.
FRANK S. CHAPIN—Nevada.
CHAS. F. BLACKBURN—Idaho.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 14.		WEEK ENDING Aug. 21.		WEEK ENDING Aug. 31.		WEEK ENDING Sept. 4.	
Alpha	.75	1.15	1.15	1.35	1.25	1.35	1.35	1.60
Alta	1.30	1.4	1.30	1.45	1.25	1.50	1.40	1.65
Andes	.55	.70	.65	.75	.70	.80	.70	.80
Argenta	....	....	....	....	....	....	....	....
Belcher	2.20	3.05	2.75	2.95	2.90	3.10	2.90	3.40
Best & Belcher	3 00	4.00	3.40	3.80	3.60	4.00	3.60	4.00
Bullion	.50	.75	.65	.70	.65	.70	.65	.85
Baltimore	....	....	.80	....	.30	....	.25	.30
Belle Isle	....	....	....	....	....	....	....	....
Bodie Con	.80	.90	.85	.95	.85	.95	.90	1.00
Benton	....	....	....	....	....	....	....	....
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.10	.15	.10	.15	.10	.15	.10	.15
Commonwealth	2 45	3.20	2.50	2 60	2.50	2.60	2.50	2.50
Con. Va. & Cal	7⅜	7⅜	7¼	7¾	7⅜	7¾	7⅜	8
Challenge	1.45	2.20	1.80	2.15	2.00	2 20	2.00	2.50
Chollar	1.30	1.50	1.80	2.10	1 95	2.20	2.15	2.55
Confidence	5¾	6	6	7	6.50	....	6¼	6¾
Con. Imperial	.35	.50	.50	.55	.50	.55	.50	.55
Caledonia	.15	.20	.20	....	.25	....	.25	.30
Con. Pacific	....	....	.40	....	....	....	....	....
Crown Point	1.75	2.55	2.70	3.20	2 90	3.35	3.00	3.50
Crocker	.35	.40	.40	....	.35	.45	.45	.60
Central	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	....
East B. & B	....	....	....	....	....	....	....	....
Eureka Con	....	....	1.35	1.50	1.40	2.75	....	....
Exchequer	.50	.70	.65	.70	....	.65	.65	.80
Grand Prize	.40	....	.35	.45	.35	.65	....	....
Gould & Curry	1.70	2.25	1.95	2.10	2.00	2.20	2.15	2.60
Hale & Norcross	2.70	3.10	2.90	3.15	2 95	3.20	3.20	3.80
Holmes	....	....	....	....	.50	.60	....	....
Independence	....	....	....	....	....	....	....	....
Iowa	....	....	....	....	....	....	....	....
Julia	.20	.25	.25	....	.30	....	....	....
Justice	1.40	1.60	1.45	1.60	1.40	2.00	1.60	2.00
Kentuck	.70	1.00	.80	....	.90	.95	1.25	1.50
Lady Wash	....	....	.35	....	....	....	.35	.40
Locomotive	....	....	.10	....	....	....	....	....
Martin White	....	....	....	....	....	....	....	....
Mono	.50	.55	.35	.60	.55	1.10	.90	1.20
Mexican	2.30	3.45	3.15	3.60	3.40	4 4	4.25	5 00
Mt. Diablo	....	....	....	....	....	....	....	....
Navajo	....	....	.25	.30	.25	....	....	....
North Belle Isle	.90	1.10	.80	.85	....	.75	.80	....
Niagara	....	....	....	....	....	....	....	....
Nev. Queen	.85	1.00	.80	.90	.70	.75	.60	.70
North G. & C	....	....	....	....	....	....	....	....
Occidental	1.90	1.95	1.80	1.95	1.85	1.95	1.80	1.90
Ophir	4.10	5.25	4.75	5⅛	4.85	5.25	4.80	5⅛
Overman	.60	.90	.75	.90	.75	1.20	....	1.40
Potosi	1.25	1.65	1.50	1.70	1.50	....	1 60	1.90
Peerless	.25	.40	.25	.35	.30	.35	.35	.45
Peer	.10	.20	.15	.20	....	....	.20	.30
P. Meridan	....	....	....	....	....	....	....	....
Silver Star	....	....	....	....	....	....	....	....
Savage	1 25	1.75	1.50	1.80	2.10	2.25	2 35	2.85
S. B. & M	1.40	1.75	1.65	1 90	1.80	1.90	1.80	1 05
Sierra Nevada	2.00	2.70	2.50	2.80	2.60	3.10	2.90	3.50
Silver Hill	.40	.45	.40	.50	....	....	.45	.55
Silver King	....	....	....	....	....	....	....	....
Scorpion	....	....	....	....	....	.15	....	.20
St. Louis	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	....	....	....	....
Union Con	2.45	3.15	3.00	3.30	3.25	3.95	3.30	4.20
Utah	.50	1.10	.80	....	1.05	1.20	1.10	1.30
Yellow Jacket	2.35	3.30	3 00	3.30	3.00	3.30	3.25	3.50

Sales at San Francisco Stock Exchange.

THURSDAY, Sept. 5, 9:30 A. M.

250 Alta	1.70	50 Justice	1.60
50 Andes	70c	1210 Mexican	4.05
150 Alpha	1.30	100 Mono	1.05
300 Belcher	2.85	50 N. Commonwealth	.60
450 Best & B	3.65	200 Occident	1.75
100 Bodie	.95	390 Ophir	4 60
300 Challenge	2.05	300 Overman	1.30
50 Chollar	2.05	100 Peer	20c
100 Commonwealth	2.50	100 Potosi	1.55
10 Confidence	6.50	450 Savage	2.25
50 Crocker	55c	200 S. B. & M	1.75
500 Crown Point	3 00	350 Sierra Nevada	2.90
400 Con. Imperial	50c	150 Utah	1.15
300 Con Va & Cal	7.75	1350 Union	3.20
150 Exchequer	65c	900 Weldon	30c
850 Gould & Curry	2.15	300 Yellow Jacket	3.15
100 Hale & Nor	3.15		

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

IT is stated that a vein of cannel coal of superior quality has been discovered within 20 miles of Ellensburg. The vein is about nine feet thick and the first of the kind found in Washington.

At the last meeting of the California Academy of Sciences on Monday evening last, the Academy was addressed by Dr. George Vasey, Botanist of the Agricultural Department at Washington.

Robert Tait, an old-time millwright of Butte, is about to construct a 20-stamp mill on the Champion, near Deer Lodge.

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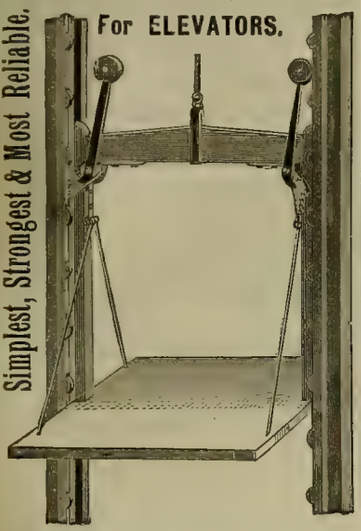
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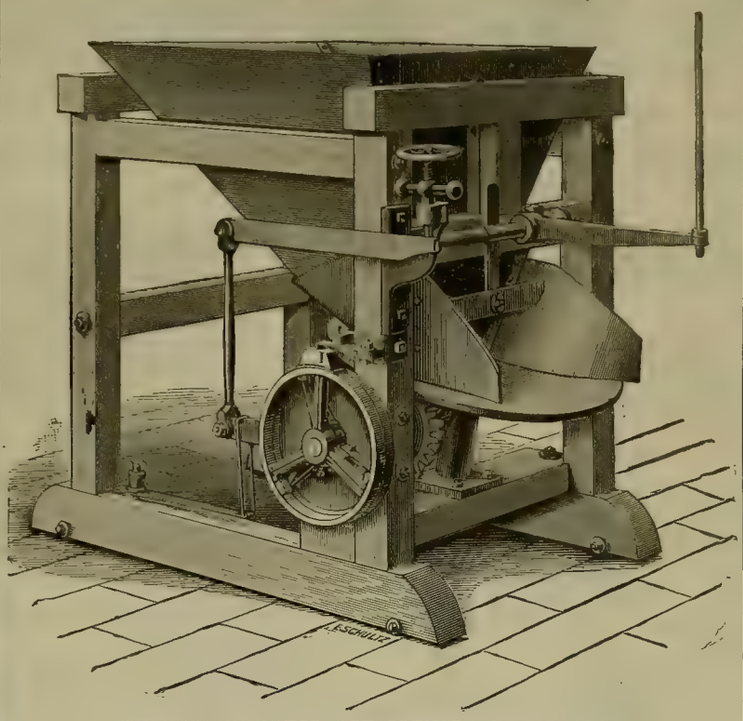
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W. G. ROBERTS, Greenwood, El Dorado Co., Cal.
D. C. WICKHAM, Taylor Mine, Greenwood, Cal.
J. R. TREGLOAN, Supt. South Spring Hill Gold Mining Co., Amador City, Cal.

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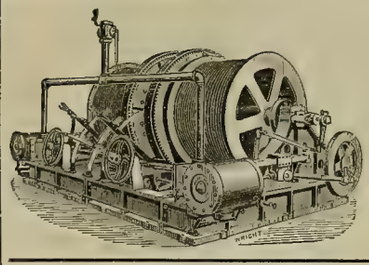
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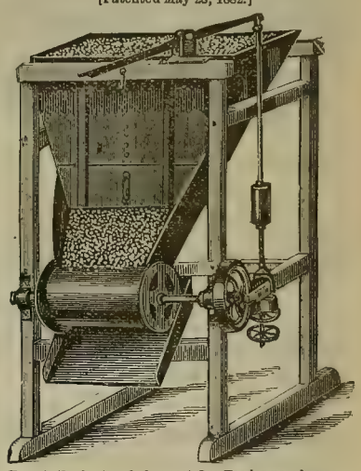
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Mr. Henry Anderson, the Inventor and General Manager, has just returned from the East, where he contracted with the Pittsburg Rustless Iron Works of Pittsburg, Pa., for Rustless Steel, prepared by them for the Company according to the Boyer-Barff process. Thirty tons of this steel are now on the way.

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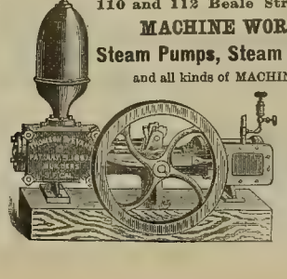
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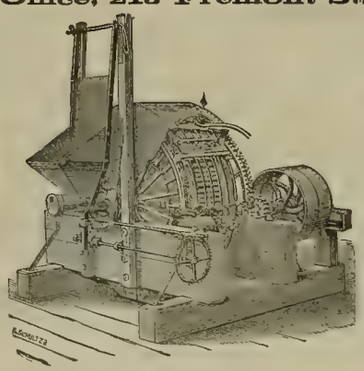
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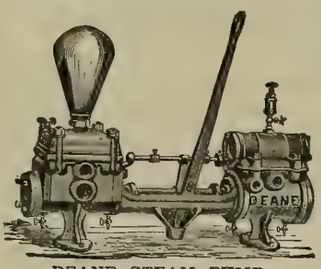
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COAL MINES OF THE WESTERN COAST.

A few copies of this work, the only one ever published treating of Pacific Coast Coal Mining, have been obtained, and are for sale at this office for $2.50 per copy. It was written by W. A. Goodyear, Mining and Civil Engineer, formerly of the California State Geological Survey.

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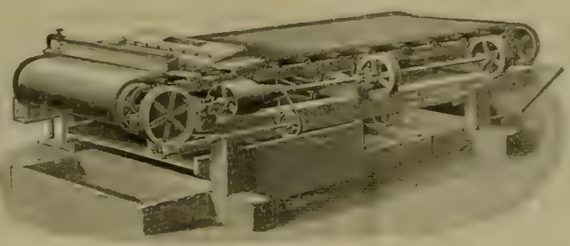
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THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., Room 15, No. 132 Market Street, San Francisco, Cal.

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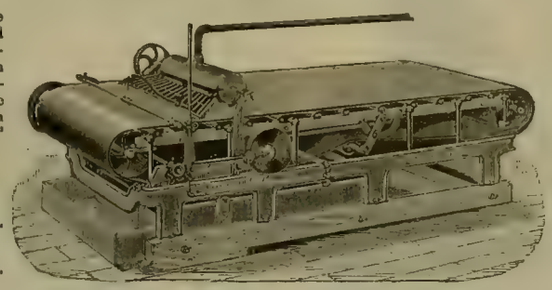
The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

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(PATENTED.)

Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

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Original Empire Mill and Mining Company, Principal Office, 401 California St., cor. Sansome, S. F. Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., NOV. 10, 1885.

Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanner or concentrating devices. DAVID McKAY, JR.,
[Signed] Sup't North Star and Original Empire Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

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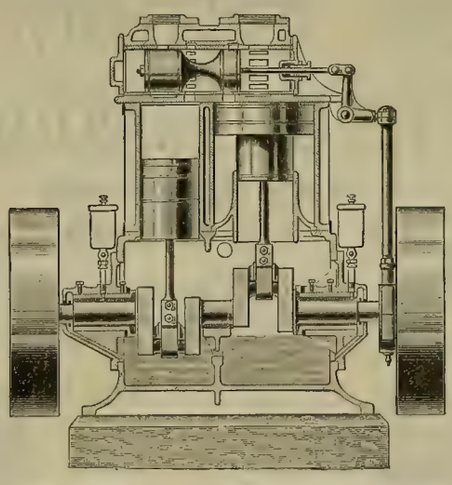
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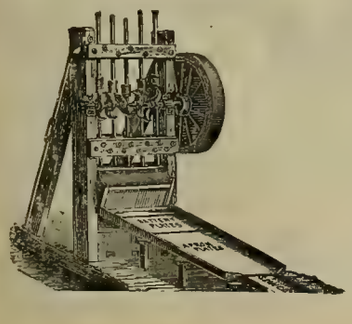
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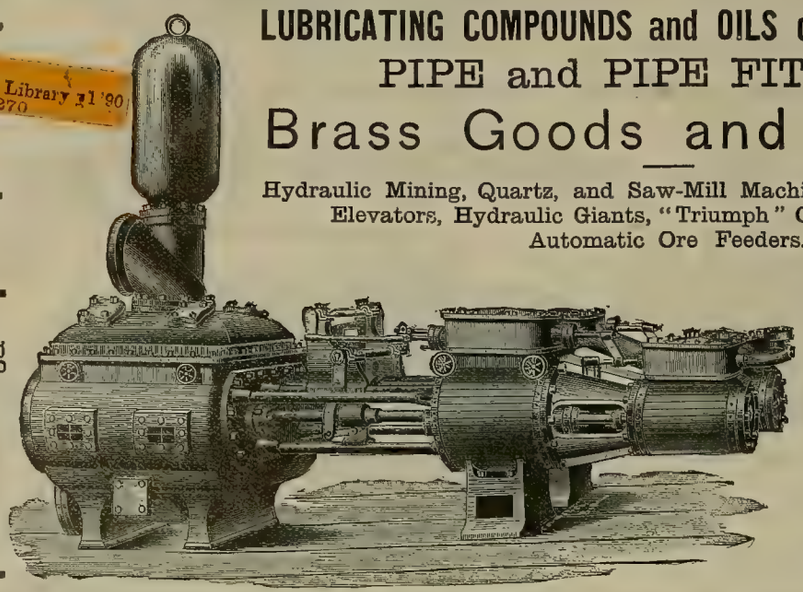
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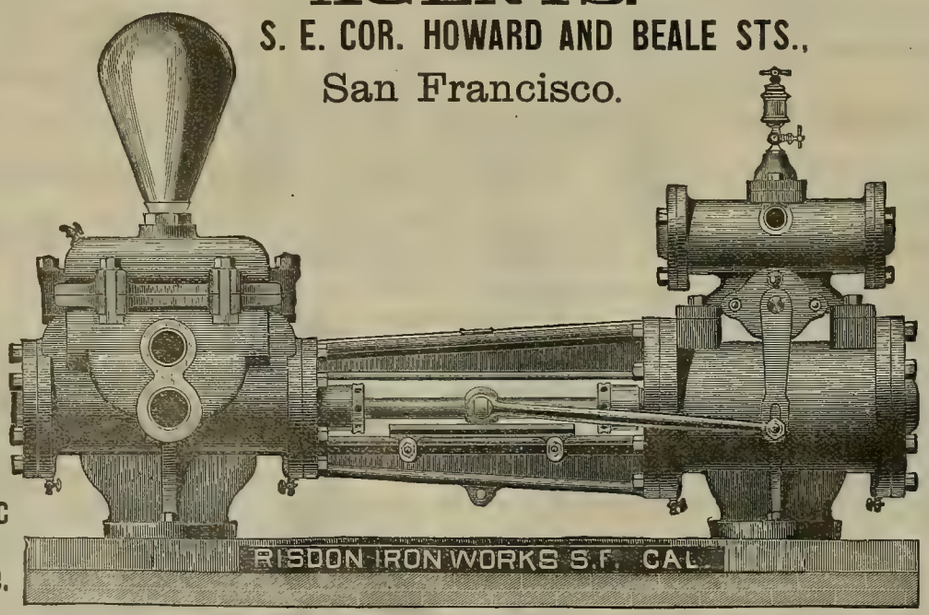
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VOL. LIX—Number 11.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, SEPTEMBER 14, 1889.

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Pan Amalgamation.

The Boss Continuous Process.

In early pan practice it was thought absolutely necessary in amalgamation that the pulp should be very thick—so thick that at its surface the movement was slow and the quicksilver rolled leisurely along with it in great shining beads. Nor was this belief at that time incorrect, for the pans of that period were not suitable for treating thin pulp. Close attention was required of the millman upon this point, or his percentage suffered.

As improvements followed and the pan developed it was found that the quicksilver could be carried in minute globules throughout the pulp in far more intimate and rapid contact of particles by thin charges when the pulp currents were sufficiently strong and systematic, and that with these thinner charges the efficiency of the pan increased and less motive-power was required.

Having acquired this knowledge from practice, Mr. M. P. Boss became imbued with the idea of discarding the tanks and the practice of working the pans by charges, and developed what is now so well known as his "continuous system."

Beginning with the battery, it was found that the use of water in such excess as had been customary was unnecessary; that by using a coarser screen and reducing the water to give the same output the fineness of crushed pulp was practically the same. A battery in this manner gave a properly thin pulp for panning. The pulp from the battery flows direct to the first of a line or system of pans. The first pan when full overflows into the second, the second into the third, etc., throughout the series. From the pans the pulp flows through a series of settlers in the same manner, thus passing through the mill automatically.

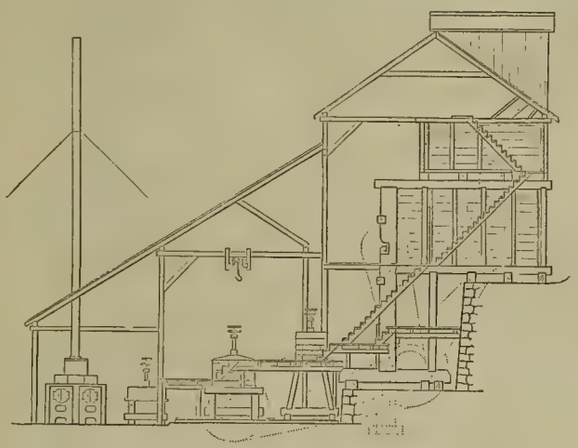
The pulp may before amalgamation pass through a series of special grinding pans, or it may be ground in the first pan or pans of the regular series.

The preparatory chemical treatment is applied by automatic feeders to the first or near the first of the regular pans.

The amalgamating pans are arranged to run quicksilver in and out at will, and chemicals may be applied to benefit the quicksilver at or near the last of the line of pans.

In amalgamation by this method, the pulp comes to the pans in even and regular proportions of sand and slimes. It all necessarily passes through the series of pans and settlers, and receives a uniform treatment. This uniformity and regularity cannot be attained when the pulp is settled in tanks and worked by charges. The amount of treatment the pulp receives in its passage is proportionate to the size of stream that flows into the pans, and the amount of treatment may be increased by decreasing the inflow, or vice versa.

With the advantage of a thoroughly systematic treatment, the greatly lessened labor and the comparative cleanliness, popularity naturally befalls the continuous system of pan amalgamation. These mills are built and erected on the ground ready for work, by the Fulton Iron Works of this city. One is now in process of erection at the Golden Gate mine, Tuolumne county.

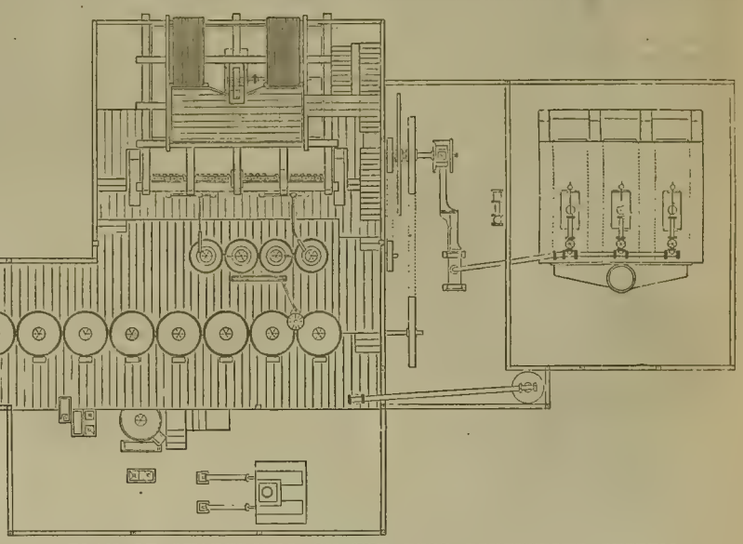


BOSS CONTINUOUS PROCESS MILL.

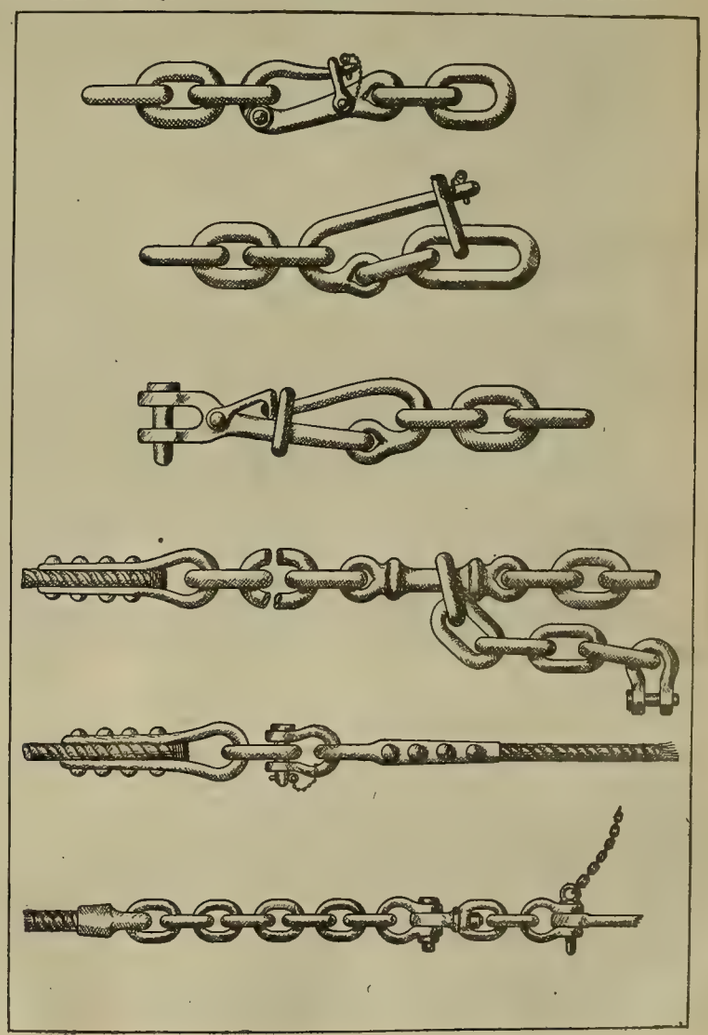
This process has marked a distinct advance in the milling and amalgamation of silver ores on this coast and in Mexico. A great saving is effected in power, wear and tear as well as the labor required for its operation over the old system of settling-tanks and pan charges. By an examination of the cuts shown herewith it will be seen that a large reduction is effected in first cost in the erection of the mill. The tanks and tank-room are entirely done away with, slum and china pumps are no longer needed, and the shoveling of the settled pulp from the tanks into the pans entirely avoided. The buildings cover less area, and as the pans and settlers are all on the same level, high pan frames with the grading and retaining walls they render necessary are also saved.

Upon the ore coming to the mill it is dumped over the grizzlies and passes through rock-breaker and ore-feeders into the batteries in the

(*Continued on page 208.*)



PLAN OF QUARTZ-MILL ON THE BOSS CONTINUOUS SYSTEM.



CONNECTIONS OF MINING CARS WITH HAULING ROPES.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Ophir.

Renewed Activity in an Old Mining Camp.

EDITORS PRESS:—For some time past the mining industry in this portion of Placer county has been decidedly on the wane, and the indications were that but few more pages would be added to the mining history of this once thrifty and profitable mineral belt. This state of affairs was the result of a combination of causes of no great moment, but of sufficient importance to produce for the time being a general stagnation. That the mines yielded almost fabulously in the palmy days of the past is an assured fact, and that extensive and paying ore bodies still exist is equally as certain. Many promising quartz fields are to-day practically abandoned or only sufficiently worked to protect the titles to property, either through bad management that has resulted in the cessation of operations in leading mining propositions and the closing down of other properties that were only developed to a very limited extent. The latter theory is applicable here and is unquestionably the primary, and, in fact, the sole cause for the decline that has been experienced. The opinion has prevailed among mining men that this district was one of the "pocket" order, and it must be admitted that the shallow workings and the discoveries made have gono far to corroborate this opinion. This idea has kept capitalists from becoming identified with our promising camp, and deep development is consequently unknown. Without but a single exception it is a question if there is a property out of the large number operated in the past that has been explored to a greater depth than 250 feet, while the majority of them that paid well have never been developed below the 100 level. Within the last two years, however, a radical change has taken place and our struggling delvers can now discern the glow that foretells of brighter days. Syndicates and combinations have been formed that are now operating some of our most promising properties, and so far as development has progressed results of the most encouraging nature have been their reward.

The Hathaway Mine,

Operated by Valentine Bros. of San Francisco, is a striking illustration of what depth will do toward enhancing the probabilities of our surface—prospected mines—and the pronounced improvement that is everywhere apparent in the deeper workings of that property will be a safe criterion for the guidance of those who premeditate operating here. For years this property existed only in name, no work of any consequence being performed in it, but to-day it is one of the best paying mines in this portion of the Golden State, and is steadily improving in value as work progresses. True, the character of the ore has become more rebellious as depth has been attained, but this is a natural characteristic of gravite formation and a change that mining men of experience expect. Fortunately this change is no detriment to the owners, but to the contrary is a welcome one. Though refractory, it is exceedingly rich, and, under the system of concentration employed, it is easily saved and transported to chlorination works for reduction. In connection with the sulphurets, the vein also carries a paying quantity of free gold.

The Eclipse,

Another mine of great promise that was recently purchased by a combination of Eastern capitalists is now being developed under the supervision of J. B. Patterson, through whose efforts the property was sold. In early days this mine was extensively worked, near the surface, by Spaniards, and the rock milled through arastras, and those who are conversant with the past history of the property assert that it yielded gold in large quantities, but the volume of water encountered and the inability to handle it by the primitive methods employed, no efforts were ever made to follow the ore body below the water level. Time and time again parties undertook the responsibility of giving the property a general exploration, but as often abandoned the undertaking, fearing to delve deeper on account of water. The development that has taken place under Mr. Patterson's supervision has demonstrated the fact that the volume of water generally regarded as an insurmountable obstacle, has its home near the surface and that the greater part of it can be caught in tanks, thereby doing away with all the inconvenience it has caused, and the mine can be probed at a great depth with but little trouble from this source. The location, if your correspondent has been correctly informed, comprises 24 acres in the very heart of this rich mineral zone, and is traversed by three ledges that crop on the surface, all of which have yield. ed well. The veins are remarkably strong and well defined, existing between perfect walls, and though the formation is granite there is a lap of porphyry on the foot-wall that follows, with striking regularity, the three veins. So far as can be ascertained, but little drifting has been done on either of the veins—all the wealth extracted having been taken from the numerous shafts or inclines that were sunk or within a very short distance on either side of such openings. Though it is well known that this entire belt is a perfect network of quartz veins, it is remarkable that no underground crosscutting has been performed, but to the contrary, all explorations have been confined to the veins upon which openings were made. As an illustration of the benefits to be derived from such

Work Under the Ground,

It is only necessary to call attention again to the fact that three strong veins, all having a surface existence, pass through the Eclipse location. Is it not a reasonable hypothesis that an equal or even greater number of what are termed "blind ledges" have a home within the confines of the boundary lines. These so-called "blind ledges" are just as liable to hold a chute of ore as those that throw "float;" in fact miners have a superstitious idea that hidden veins are the best. Supt. Patterson is thoroughly familiar with all the peculiarities of this mineral belt and particularly acquainted with the Eclipse ground, and it is his intention to drive the improvements already projected, into virgin ground, and then crosscut the territory on either side of both veins upon which inclines are being run.

Arrangements are now being made for the erection of hoisting works, and when this essential is in operation a searching exploration of the ground will be commenced. The opening of this property is watched with deep interest by mining men identified with this district, as the future of the camp will depend largely upon the success or failure of this proposition. Old-timers, however, all concur in the opinion that success will certainly crown the effort and that a valuable and heavy producing mine will be the result. Water-power will be employed to run the machinery, and economy, in operating the property, will be most rigidly observed. The property is admirably situated for cheap working, being within a short distance of the railroad, and the cost of transporting necessary mining supplies, etc., comparatively light. By way of diversion it might be interesting to those who are identified with the property to know that

There Is a Gulch

Between the two veins upon which they are now sinking, and during the placer days of long ago this gulch was worked from its source to its mouth, and if reports be true, and they seem to be well authenticated, was fabulously rich, pieces of the "yellow metal weighing as much as $2000 having been taken from the shallow surface washing. This gulch was unmistakably fed by the float from the two ledges alluded to or the wearing down of an ore chute in one or both of them. Taking everything into consideration, those who are investing in this proposition have the assurance that their venture is one of great promise, and if the opinions of experienced miners have an existence in fact, the time will come when "Eureka" will be their cry.

It is reported that the Gold Blossom, an old and well-known mine, will be started up this fall or as soon as water can be obtained to run the machinery. The Bellevue is now being worked and it is rumored that a force of men will be put to work in the Three Stars and the Belmont.

That the mining horizon is much brighter than it has been for years is positively certain and it is not improbable that our old mining camp will again experience a semblance of its old-time glory. R. C. G.

The Arlington Mine, Washington.

EDITORS PRESS:—In your issuse of Aug. 3d, I see you have copied from the Ellensburg paper that the Arlington Company are making arrangements for the shipment of 400 tons of machinery over the Ellensburg & Conconally line of boats. Like all other things, there is some truth about it, but as yet the machinery has not been purchased, although they are just in the act of getting machinery. The company have a brickyard cleared, about two miles from the mine, and the making of brick has commenced under the supervision of Joe Klineman of Red Bluff, Cal. It will require about 400,000 for immediate use, as these will be rather extensive works. Part of the Russell process is adopted, but the bulk of the machinery will be bought at San Francisco and shipped to Portland by steamer; then by Northern Pacific to Davenport; then about 120 miles inland by teams to the mine. Everything indicates a general movement by the Arlington Mining Co. for the erection of a mill. Brick, lime and lumber are being made ready for the occasion. The mine is well opened by tunnel and everything is in readiness for the extraction of ore to supply a milling capacity of 50 tons daily.

Other claims in this vicinity are doing well. Among the richest are the Fourth of July, First Thought, Ruby, Idaho, War Eagle and the Modoc, all considered valuable claims, with ledges varying from four feet to 20 in width, with a grade of ore from $20 to $400 per ton. If the working of the Arlington mill is a success, of which there is not the least doubt, we can soon expect the erection of other mills; but like all new camps, one enterprising company has to take the lead in these things. If successful, then others readily follow. The little town of Loup Loup is filled with people, woodchoppers, brick-makers and lumbermen. The boarding-houses or hotels are crowded, giving the new town a lively appearance. Times will be better this fall than at any time since the camp was first discovered. MINER.

Ruby, Okanogan Co., W. T.

Mines in Sonora.

The Chipionenya Mines and Reduction Works.

EDITORS PRESS:—This important property is situated in the foothills of the Sierra Madre, in the district of Ures, State of Sonora, Mexico, and is 70 miles due east from Hermosillo, which is connected by railroad with Guaymas on the south, and with Benson, on the S. P. R. R., on the north. A good and easy wagon-road reaches from the Sonora railroad, the Chipionenya, over which road no more than $12 is charged per ton for freight. (All dollars mean Mexican coin.)

The mine property consists of the Chipionenya of 200 meters length by 200 meters width, and of its extensions, Buenos Ayres of 200 meters length by 300 meters width, and La Emma of 800 meters length by 300 meters width, and of the El Jicote of 800 meters length by 200 meters width, which ledge runs parallel with and 1000 meters west of the Chipionenya. Of these a part of the Chipionenya and part of the extensions are developed by a shaft 100 feet deep, double compartment, and operated by a horse-whim, and about 170 feet northwest of it by an incline of 30 degrees pitch and 145 feet long, both connected on the level by drifts, which extend about 300 feet, all in good ore. Of different pillars in those parts of the mine which were cleaned out since the resumption of operations, samples were taken which averaged 148 ounces silver per ton.

The ledge is from one to five feet thick, and averages on the lower levels four feet, dips east 45 degrees, and runs in a north by west direction. Country rock is granite; both walls of ledge are well defined. There is some water in the mine, easily handled with buckets, as even in the wet season there is no more than 600 gallons in 24 hours.

From the outcroppings which can be followed for over half a mile, the first owner, a Spaniard by name of Chipiona, sank three inclines in in 1824, following the ledge, and took out considerable silver, enough to make him rich, and the builder of churches in Sonora and in Spain. The work was done in the then usual slipshod manner, taking out the richest ore, and throwing the balance, mixed with debris, on the dump, which contains now about 20,000 tons low-grade ore, which could be benefited by assorting it by hand, as is the fashion in many paying Mexican mines, where the absence of sufficient water or capital necessitates such crude and primitive proceedings.

After Chipiona's death the mine passed into the hands of different Mexican owners, who went on "scratching and badgering," as was then and there customary, with more or less, generally less, success, till an American company got hold of it, which then proceeded to sink the above mentioned incline to run the different drifts, at the same time constructing mill, leaching tanks, roasting furnaces, reservoir, till the superintendent, an Englishman, was killed in a quarrel with his foreman, who fled, and thus the whole concern was left to the acquisitive tendencies of the population, which made such good use of such a rare, and to them desirable opportunity, that nothing of value which could be moved, not one loose nail, was left on the spot. This occurrence in conjunction with Apache raids and the Franco-Mexican war brought ruin and devastation.

In course of time the property passed into the hands of some enterprising people, who began the cleaning of the mine and the reconstruction of the works, which consist of a ten-stamp mill with rockbreaker, run by steam, six large brick roasting furnaces, ten leaching and precipitation tanks and settlers, a cemented reservoir holding 440,000 gallons. Connected with the works are blacksmith and carpenter shops, buildings for stores, offices and dwelling houses.

The mill, furnaces and tanks are able to work 25 tons of ore in 24 hours. Salt can be delivered at the mine at $22 per ton. Mining timbers close at hand, and fire wood at $3 per cord. Wages are $1.25 for miners and 75 cents for workmen.

Water is brought to the reservoir through a two-inch pipe from a spring half a mile above, and if the supply should not be thought sufficient, another spring, four miles distant, could be utilized, at which point it would be necessary to pump the water to the top of a hill 500 feet high, from whence it could be brought by pipe to the works. The power could be generated at the works and applied at the pumping station through a dynamo.

Now as to the important point of the character and richness of the ores. The ledge carries a seam of argentiferous galena, occasionally 20 inches wide, which is said to average 250 ounces silver per ton, and which is smelted in one of those home-made Mexican smelters; this one is operated by a fan-wheel.

The leaching ores are mixed—chlorides and bromides of silver, too rich to mention, silver fahlore of different combinations and values, some silver-copper glance and silver glance; the ledge matter is quartz and metamorphic rock. Some 54 tons, coming from the lower levels, were sent to Denver and San Francisco and averaged 150 ounces of silver per ton with traces of gold.

Over 200 tons of second-grade ore of about 50 to 60 ounces silver per ton are on the dump awaiting some enterprising parties with sufficient means to bring water to the mine and to begin operations. The mine, as far as opened, is in good order, yet there remains several drifts and connections to be cleaned from debris, which work the present owners cannot undertake, as they have other business to attend to.

The climate is excellent, and good pasture—an important factor in Sonora—adjoins the property. THEO. G. ED. WOLLEB.

Working Cement Mines.

EDITORS PRESS:—There is gold in California for everybody. In the early days of California gold was plentiful and it was an easy matter to make a good living with a common pan, so that very often a large fortune was realized with comparatively little work. But this class of mining was soon exhausted. As the miner receded from the river-beds it was found that capital was required to bring water from long distances, therefore the pan, the rocker, and even the sluice-boxes, one by one were abandoned because the gravel and water were getting further apart one from the other. The good days of single-handed mining were at an end; then came a new invention—the little giant hydraulic mining process—but this system was possible only with large capital, and, although it was very successful, yet the debris filling the rivers was causing such damage that laws were created which virtually put an end to hydraulicing in California.

All this has paralyzed the gravel mining industry and has thrown out of employment many thousands of good men; but gold is not exhausted for all that. Large deposits of auriferous gravel exist in the so-called ancient riverbeds. This class of mines is generally remote from water, and as they are in a very hard conglomerate of sand and gravel, apparently cemented together, all the old systems have failed to make those gravel-beds yield their golden treasure. The stamp-mill was the only process that promised to be successful, but it was found too slow and expensive and had to be abandoned.

What is wanted now to revive this great industry and give employment to the multitude, and give a chance for capital to double and treble itself, is a process that will reduce the gravel cement to a pulp and that will be a simple and economical amalgamating process which will require a very little amount of water.

I have spent a good part of 17 years in solving this problem, and claim that I am able by my process to thoroughly wash 100 tons of such gravel with three miners' inches of water every ten hours. My amalgamator is founded on new principles to disintegrate cemented gravel without the aid of machinery, in fact there is not a cog-wheel employed in all the whole process. In a claim with stuff that averages only $1 per ton, by this process it is treated for 30 cents per ton, leaving a profit of 70 cents.

I am perfectly willing to impart my experience in this matter to any one interested in working the class of mines referred to. I have made many tests and am satisfied I can accomplish a great deal of work at unusually low cost. C. S. DUHEM.

5 Stockton St., San Francisco.

Surveys in Northern Counties.

A correspondent of the *Northern Advocate* says:

In looking over the MINING AND SCIENTIFIC PRESS I notice an article written by J. H. Crossman, entitled "Northern Counties of California," of which he speaks in highest terms, and thinks there should be an accurate survey and map with text-book. The map should show in detail the water-sheds, rivers, mineralogical features, and mineral belts, as well as the dead-river system of Pliocene channels—together with the timber belts, soils, and general agricultural features.

Having made this country my home for many years, and having engaged in mining and agricultural pursuits, with the ever-growing conviction that we had an inexhaustible source of wealth, not only in the productiveness of our soil, but also in the countless millions that must flow into the treasury of the world from our mines—I see that we sit idly; and I wonder why it is that capital—lying idle and seeking investment—should hesitate to invest in an enterprise that promises such great results as the opening of the dormant resources of the northern counties of California. I think the writer in the PRESS strikes the keynote. I am convinced that the great wealth of this vast district is but little known to the outside world. We are occasionally visited by an adventurer, claiming to be in the employ of capitalists, but when the facts are reached we find him a self-appointed agent, and many times not able to pay his traveling expenses. He is looking for a rich find; but, unfortunately for him, he comes to the wrong place, fortunes not being made here with the rocker or long-tom, as in other localities "in the days of '49."

But in almost every instance those "expert" adventurers are favorably impressed with the country, and return to give glowing descriptions of the vast wealth that lies hidden in what to them is the new El Dorado. But the chary capitalist can't be induced to even investigate a country that has been settled and prospected for 40 years.

The self-appointed agent, by playing on the credulity of the old-settlers, may have succeeded

in bonding a mine (that is, if he could do so without paying anything down), thinking it might help him to get capital interested in what he believes can be made to yield a bounteous return. But capital, like everything else, is hard to turn out of the worn grooves, and the expert, be he never so honest or dishonest, is doomed to disappointment, and is soon heard of no more. They all report favorably of what they see, and all agree that the country will bear investigation. The great trouble is to get men to investigate. With improved machinery and facilities for working ores of low grade, they are being sought after and profitably worked in other localities.

Investigation is what we want—and an accurate survey, and description of the resources of our country, would help us more than anything, unless it would be a railroad.

To Mend Broken Bone.—A gentleman had a small rule made of bone, which he accidentally broke. It was mended by a cement made as follows: Take of isinglass 1 ounce, distilled water 6 ounces, boil to 3 ounces, and add rectified spirit 1½ ounces, boil for a minute or two, strain, and add while hot, first a milky emulsion of gum ammoniac one-half ounce, and then tincture of mastic 5 drachms.

Wm. Wilkinson, formerly of Custer City, who is at present at the gold mines of South Africa, furnishes a less flattering account of the mines of that remote region than is given by the average newspaper. He states that the country is nearly all located, and that water is very scarce. He thinks, however, that if he had been there a year earlier he could have made considerable money. The gold found thus far is mainly in lodes, which are payable but not to the extent reported. Natives are extensively employed in the mines, and receive from 25 to 50 cents per day. White miners are only employed as foremen over the native employes. He states that O. D. Holliday, formerly of Custer City, and one of the original locators of the Old Bill mine, is there in the employ of a mining company as superintendent at a salary of $500 per month.

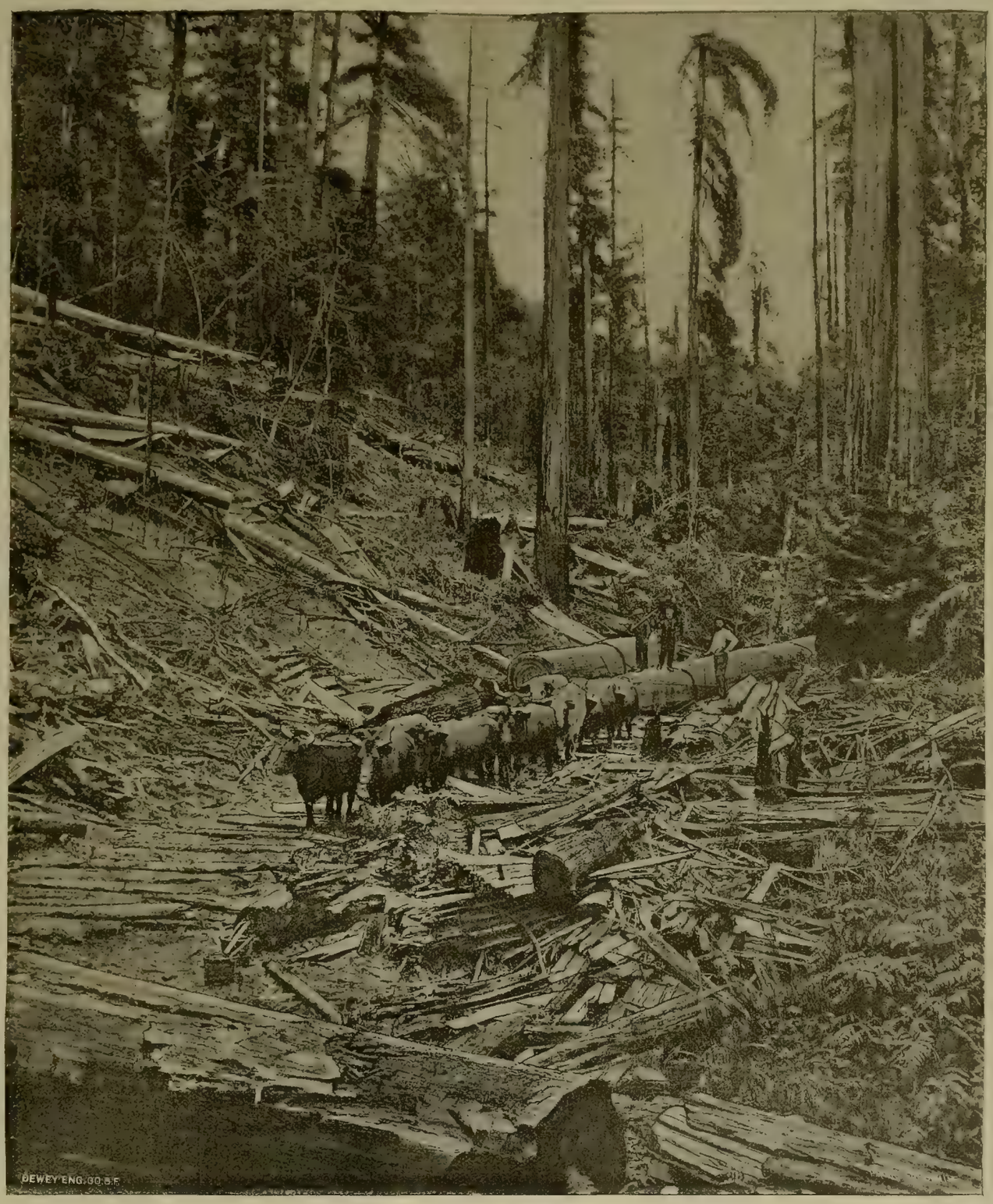
Pasteur's Treatment in Italy.—Throughout Italy the principal towns are, one after another, providing buildings for the treatment of hydrophobia according to Pasteur's system, and the municipal council of Rome has lately decided to devote the necessary sum of money to furnishing a Pasteur institute there. This is a strong proof of the increasing confidence felt in the treatment.

Logging Scene.

We give on our first page a realistic scene among the California redwoods. This particular view was taken near the Gualala river, Mendocino county. After the trees have been felled and cut into the proper length, the logs are hauled by oxen to the "landings" on the side of the railroad tracks, where they are placed on cars and transported to the mill. In some localities where there are no railroads the skid roads run direct to the mill; but this is impracticable for long distances. At most of the places on the northern coast the mills are at the mouth of the rivers and the logging is carried on some miles back from the coast. The skid roads are then used to haul the logs to the trains. These roads are made of small logs or limbs placed a foot or two apart. Along the center of the top a rounding groove is soon worn, in which the log lies. This grooved part of the skids is generally greased with some cheap lubricant so that the log will slide easily.

Of course these roads are downhill, the trees being cut on the ridges and sides of the cañons and dragged over the skids to the railroad at a low point. All the way from three to a dozen logs are hauled in a string, being connected by chains. These skid roads may be seen in all directions in the timber back of the mills. On the steep hillsides they are not used, as the logs are more easily hauled than on the surface of the ground. In some places it is not necessary to use lubricants, and in others water is poured on the skids by men who go ahead with buckets and a dipper.

To the lover of nature, the scene depicted in our engraving has a pathetic coloring. The rotting debris which forms so large a part of it, is all that remains of a once magnificent forest, a primeval temple of the Almighty Himself, upon whose towering pillars and vernal arches seemed to rest the very canopy of heaven. Year by year the ax of the woodman is eating its way into these glorious woods, the like of which is not in all the world, and the like of which will never be again so long as it shall endure.



A LOGGING SCENE IN THE NORTHERN CALIFORNIA REDWOODS.

Coal is worth $1.87 per ton at Leavenworth, Kansas.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

AMADOR GOLD MINE, LIMITED.—*Ledger*, Sept. 7: But little change at this mine for the last week. The rich ore in the north drift continues. They ran through a vein of fine-looking ore in the west crosscut from shaft No. 3, supposed to be the first west vein from shaft No. 1, and two days ago they struck quite a flow of water in the same crosscut at the 550-foot level, believed to be the hanging-wall of the west vein. Miners always like to see water when approaching a vein of quartz as a good sign. They are preparing to sink the main shaft for another level—about 85 men employed at the mine all told. The large reservoir at the mill is about completed, then about 200 men will be discharged, reducing the force to about 65.

SUTTER CREEK. — Cor. *Ledger:* Sinking the sump at the North Star is finished, which makes the total depth about 820 feet. Drifting east is now in progress, and they intend to drift not less than 150 before they will be satisfied in that direction. There will also be drifting west and south before the property will be abandoned. Strong hopes, however, are entertained of striking something good in the east drift. Everything about the Wildman is running smoothly. The riffle belts recently put on the concentrators by ex-Governor Blaisdell are running satisfactorily, and bid fair to prove a valuable invention.

Calaveras.

WILL START UP.—*Prospect*, Sept. 7: The 60-stamp mill at the Utica mine in Angels will resume operations about the first of next week. Everything is being put in readiness for work in and about the mine as soon as water can be had this fall.

RICH ROCK. — Calaveras *Chronicle*, Sept. 7: Some exceedingly rich rock was struck in the Ariel mine located on the Calaveras side of the Mokelumne river below the Boston mine, about a mile and a half from this place. The mine is the property of John Brackett and Wm. Hutchinson of this place. It is only about eight or nine months since the mine was discovered and work commenced upon it. For some time after hitting upon it the owners prospected to a considerable distance along the vein in an open cut, crushing the crumbled rock in a mortar and panning it out. It paid very rich at times. One day as high as $400 was taken out by this simple method. A tunnel is being run into the hill, which is now in a distance of 40 feet, showing a vein of rock one foot in width at a depth of 60 feet from the surface, from which the handsome specimens to which we refer were taken. The prospects are that Messrs. Brackett and Hutchinson have found a valuable mine. The Eureka mine at Blue mountain now owned by Fred Greve, Esq., is also showing some splendid rock. The prospecting shaft is now down to a depth of about 100 feet, showing a vein three feet in width and ore averaging $75 per ton.

El Dorado.

SOLD.—Placerville *Observer*, Sept. 10: According to previous notice the McNulty quartz mine was sold at Trustees' sale on the 3d inst. for $30,215.18, J. B. Drury of St. Louis being the purchaser. Mr. Drury tells that operations will be commenced in earnest as soon as water can be procured for hoisting and other purposes. We are glad to note that this work will be conducted under the management of Mr. R. S. Raw, which is a guarantee that a thorough system and strict economy will be the rule. James Vandegrift was up last week from the Los Padre mine near Nashville. The shaft is down over 50 feet in good ore, the ledge being over 3 feet wide. Mr. Vandegrift intends making arrangements to put up hoisting works. This mine is on the same range as the McNulty, Church, Equator and other important mines. The finest gold ore shown in this town for a long time was brought down from the Bobby Burns mine during the past week. At water level the ledge is nearly five feet wide, showing free gold, galena and iron sulphides. This mine has reached a depth about as deep as it can be hoisted by hand. At water level the ore seems to increase in richness, showing not only more free gold but a decided increase of sulphides.

Inyo.

SOUTH-EASTERN INYO MINES.—Cor. Inyo *Index*. Sept 4: At Wild Rose district the canyon widens out, forming a little valley of several acres of black loam. A small four-stamp prospector's mill, with barrel for treating ore under the Aaron process, is now successfully treating ore from the district, giving excellent returns for its limited capacity. Easterly from the mill the canyon opens out into a large valley covered with grasses, forming a fine winter and summer stock range. A good wagon-road with a light grade runs from the mill, through the valley, to the timber. At a distance of seven miles, the Modoc M. Co. some years ago built 10 charcoal kilns at this point. A few years ago, when Lookout mining district was running her smelters, this was the source from which timbers, charcoal and fuel were obtained. At a distance of three miles from the mill lies the Virgin mine. Considerable work has been done toward developing the property sufficient to expose a body of ore about 14 feet wide, which averages 41 ounces in silver, as sampled by a party now having it bonded. Six miles north the North Star mine is situated in mountains east of the valley. Three miles farther north, higher up the mountain-sides, and the Garibaldi mine is seen. Still northerly, some three miles, and the Nellie Grant mine, with its big body of free ores, is found. Here is plenty of water, one spring furnishing sufficient for a large mill. A natural pass, having but slight grade, leads from this point, which is called Emigrant Springs, to Furnace creek in Death valley. From Death valley, a short distance north of Coleman's borax works, to Panamint valley, heavy loaded teams have passed down to the valley without trouble and with no road to follow. West, down into Panamint valley, the grade is gradual. A railroad passing through this route would open up a fine mineral country to the north and south, receiving an immense amount of low-grade copper and lead ores which are now practically valueless. It would make the enormous borax works of Death valley, now idle, profitable to work. It would build up a country richer in mineral wealth than any other part of the United States. Enormous lead, copper and antimony ledges that cannot now be successfully handled will then be worked, furnishing the railroad freight in considerable quantities. For instance, there are several antimony ledges in this vicinity which have had work enough done upon them to expose great veins of high-grade ore, in some cases over 12 feet wide, with hundreds of tons of ore upon the surface, which, from careful average samples, is worth, delivered at railroad depot in San Francisco, $40 per ton. Under present conditions it costs at the least $38 per ton to deliver the same there, bringing the shipper $18 per ton in debt for transportation, excluding other incidental expenses.

FIRE CLAY. — A large body of fine pipe-clay has been exposed by the elements close to the pass which appears, from casual inspection, equal to the German article used by glass works for their pots.

MONSTER LEAD BLOW-OUT.—From Emigrant Springs, following an Indian trail 14 miles over and near the summit, up hill and down hill in a northerly direction, we find ourselves at the head of Big Cottonwood canyon. South over the trail to a small spring, then up the mountain-sides westerly to a big lead blow-out, where are hundreds of tons of galena carrying from 50 to 80 per cent lead, and about 12 ounces in silver per ton. The ore is scattered about in all directions, from minute particles to boulders weighing a ton or more.

ABANDONED PROSPECT.—Back again to the summit, following the trail a few miles on the western slope of the range, a short distance west of the trail, the ruins of an old log cabin stand near to where considerable work has been done in former years by some prospectors. A large pile of lead ore lies upon the dump. Cuts have been run and shafts sunk, exposing a fine ledge. The circumstances under which this work was performed must have been very discouraging, as the nearest water is six or eight miles away, and it is about 40 miles to where provisions could be obtained. The formation is lime, massive and of character favorable for large bodies of ore.

EXTENSIVE MINERAL TERRITORY.—The section passed through has every characteristic of a true mineral territory. Great porphyry dikes trend through the mountains. Greenstone protrudes. Sulphur banks exist. Basins with their aqueous formations, which were formerly hot springs, can be distinctly traced. Veins with well-defined walls, having clay-porphyry and plastic clay gouges and ledge matter, can be traced for miles. Many veins have been exposed several hundred feet in depth, where the ground was favorable for such work, by means of crosscutting through tunnels. Having been in British Columbia, Idaho, Montana, Wyoming, Colorado, Utah and Nevada, and seen many mining districts in those sections, all considered to have very valuable mining territories, they are all dwarfed in comparison to the extent and magnitude of this section. These are no imaginary conclusions, but the result of some two months' observation, and the conclusions are arrived at from more than 20 years in mining sections.

Mariposa.

GOLD-BEARING QUARTZ.—Mariposa *News*, Sept. 7: For an area of 30 miles in length by 10 or 12 in width, in what may be called the mineral range of the foothills south of the Merced, the whole territory abounds with gold-bearing quartz. Most of it is a low-grade proposition; now and then some rich rock is found, but for a variety of causes, principally the want of a cheap motive-power, our mining industry is at a standstill. Wood is high, water scarce and capital nowhere. The Mariposa Grant has been, and always will be, the cause of the whole county being idle, until it is fully developed. One of the best-paying properties now, and one that will very shortly attract the attention of mining men, is the Francis mine. This mine was opened away back in the '50's. A few blows of the pick unearthed a treasure, and satisfied with it, the owners left it to be claimed, jumped and abandoned. Lately, a certain amount of capital was invested therein, machinery was bought, roads built, a great deal of bungling work done that finally proved a failure, and brought it into its present owner's hands. The probabilities are that next winter it will astonish a few hitherto unbelievers. The main tunnel is 140 feet, running east and west. In the upper drift, communicating with the tunnel by means of a stope, are four feet of good pay rock, richly streaked with sulphurets. For a distance of 30 feet the vein runs clearly defined between solid walls, country rock on hanging, porphyry on foot-wall, when it swells into a hog-back pinching the vein to two feet of rich rock and a pay streak clear up to the hanging, then sloping again at an angle of 60 degrees it pitches into the bowels of the mountain between hard, solid walls with scarcely any water to interfere with the working. At the present time works are on a rich chute pitching undoubtedly toward the mother lode, one-half foot solid pay streak on the foot-wall full of iron pyrites, galena and light sulphurets, two feet of white porphyry, then three feet of rich decomposed matter stuck on the hanging-walls. The mine has a fine 10-stamp mill, prepared for running by either steam or water-power, with facilities for 10 more under a 48-feet pressure. A No. 2 Dodge breaker, right near the tunnel, does away with all extra handling of rock. At present water is scarce.

Napa.

QUICKSILVER SHIPMENTS.—*Calistogian*, Sept. 4: During the month of August flasks of quicksilver produced at the mines were shipped from Calistoga to San Francisco as follows: Bradford mine, 164; Napa Con. mine, 400; Gt. Western mine, 17; Sulphur Bank, 225; total for the month (flasks), 806.

Nevada.

THE ROACH & MANION. — *Tidings*, Sept. 6: Nothing has been done on this claim, situated on or near Carey Manion's place, since the water-power hoisting and pumping plant was put in, two months since, water-power having failed. This winter, however, development work will be actively prosecuted. To near water level, where a barren streak was encountered, the ledge averaged from four to eight inches in width and yielded over $20 a ton. At water level, and just before operations were suspended, the original ledge was again encountered.

STRIKE IN THE HERMOSA.—*Tidings*, Sept. 4: From the 90-foot station of the Hermosa mine to the depth of 125 feet, there was no ledge in the shaft. Monday the contractors at the depth last stated, cut a solid vein of quartz one foot in width, and the indications are such as to warrant reasonable elation on the part of the owners. Free gold and other minerals are shown by the quartz, and pans of fine dirt taken from above the ledge and washed, return an average of 10 cents to the pan. Developments will be watched with interest.

IMPROVEMENTS AT THE IDAHO.—Grass Valley *Union*, Sept. 7: The Idaho Mining Co. is now preparing to make some important improvements about the mill. The large buddle heretofore used for separating sulphurets from the pulp is to be discarded and Frue and Triumph concentrators put in. An additional battery of five stamps is also to be put in, making in all 40 stamps for crushing the ore. It will take 16 concentrators for this number of stamps, 10 of which will be the Frue and six the Triumph. To provide for these the mill floor will be lowered, the necessary excavation for which is now being made, but the floor will not be removed until everything is in readiness, so as not to interrupt the regular operations of the mill. Besides the concentrators other improvements will be made in the aprons and sluices connected with the batteries. The work is now being done, and will involve an expenditure of some thousands of dollars. The work of remodeling the mill will be completed in about six weeks.

Plumas.

THE JOHNNY BULL.—Greenville *Bulletin*, Sept. 4: The five-stamp mill on this property started up on July 25th and a cleanup was made last Saturday. It is reported that the product was between $1600 and $1800. The mill crushes on an average 7½ tons daily. This showing is very satisfactory and proves the mine to be a valuable property. The owners are driving the tunnel ahead and stoping out ore. The prospects are equally as good as those of the past month. The ledge continues strong and well defined. The whole property is operated with little expense comparatively, and as the ledge goes directly into the steep mountain and the tunnel begins at the bed of the canyon, it seems a certainty that a large sum of money will be taken out by the owners, Messrs. Firmstone, Old and Richards.

THE ALTONA.—Judge Emmons, the owner, has been crushing the ore at the Arcadian mill, which has now run a little over a week. The Judge reports good progress and appears to be well satisfied with results thus far obtained. Many reports come to us from the North Fork to the effect that James Firmstone and Samuel Ballou are obtaining good pay from their river claim below the Glazier mine. They put in a wingdam and are working a bar. One man in three days took out eight ounces of gold; but of course no such average as this is maintained. The present river cut the channel of which the Glazier mine is a part, and the mine now worked by Firmstone & Ballou is supposed to have resulted from a break in the old channel near by and above. Work at the Indian Valley is now progressing as usual. The water in the shaft will soon be pumped out. The Union tunnel is driving ahead with the usual speed. News comes from Butt Valley that a large nugget was found in the Dutch Hill mine last week that weighs $714. A Burleigh drill has been placed in the Crescent and is operated by steam. It is said to work well now. The mill continues to run as usual.

San Diego.

PINE VALLEY.—*San Diegan*, Sept. 7: C. W. Withrow, a veteran miner, is in from Pine valley. In answer to questions asked by the reporter, Mr. Withrow gave a brief description of the valley and explained what the miners are doing. Pine valley is 50 miles from San Diego, ten miles east of Descanso, and only seven miles southeast of the big Cuyamaca reservoir which is the source of supply for the San Diego Flume Co. Pine valley is, in fact, located not far from the desert and close to Laguna mountains.

JULIAN AND BANNER.—Cor. Los Angeles *Miner*, Sept. 4: The mines near Julian and Banner are all included in one district. A high hill separates the sites of the two towns. On the Julian side, the principal mines are the Owen and Gold Ring groups of mines, and the Stonewall. The Owen mine, formerly owned by James & King, but recently sold to Mr. Williams of Ohio, is one of the old reliable Julian mines, having yielded to its owners $300,000. From the Owen, a short drive brought me to the Gold Ring, a group of mines owned by Messrs. Hamilton, Feeler & Melrose. These promise to be a second Stonewall in producing gold. The owners are pushing work, and are being richly rewarded for their labors, as the ore now being taken out mills over $200 per ton. As to the famous Stonewall, and I had heard that the mine had closed down for want of ore, imagine my surprise at finding a 10-stamp mill running day and night and a substantial foundation being built for a 40-stamp mill There were 130 men working in the mine, to say nothing of the men who are working in the shingle-mill, brick kiln, etc. There are also the San Diego mine and the Helvetia mines, which, with the Owen mines, are on the far side of the barren hill back of Julian, and have both been worked somewhat. They are both considered very fair mines. The San Diego was owned by James & King, and was included in Mr. Williams' purchase. In the Banner district I visited the Ready Relief, Hubbard, Redman, Hidden Treasure and Antelope, all these properties being owned by the Bailey Bros., and I found work progressing in good shape. The first thing that attracted my attention was the absence of timber in the shafts and tunnels, slate and rock being used instead, which is a great saving in expense, as well as in labor. They are conveniently located for both wood and water, and the method of developing them is excellent. The next mine visited was the Atlantic Cable, which is adjacent to the Bailey property. This mine is owned by the Cowles Bros. and G. Redman, but is at present bonded by a Los Angeles party. It shows a three-foot ledge at a depth of 85 feet and carries $30 ore. The writer next visited the Fraction, where all were busy driving a tunnel, work going on day and night. Last but not least in this old mining district, I found myself clinging to a rope and being lowered to the 65-foot level of the Cincinnati Belle. This mine deserves more than a passing mention, being probably one of the richest ever discovered on the Pacific Coast, as the former owner and locator of the mine has taken from it thousands of dollars with hand-mortar, working the mine alone. The mines named are all that are being worked to any extent.

Sierra.

HORSE SHOE.—*Mt. Messenger*, Sept. 7: Dan Reilly was down from the Horse Shoe quartz mine Sunday, and reported the tunnel in 800 feet, with face in very hard rock, crosscutting from the main tunnel. Wm. Rowe and C. D. Beightol were down from their Big Crevice drift mine, Secret Canyon, Sunday, and report diggings paying well. They took out one-half-pound nugget last week. The fires are not in their vicinity.

SIERRA CITY.—*Tribune*, Sept. 7: Sierra City is still the leading mining district, and it will be as lively here as ever again in the spring. What place has got more rich mines and prospects around it than Sierra City? The Young America mine is as good as ever. They employ over 100 miners regularly. The cleanup for August was $20,000. The Cleveland mine, situated a short distance from town, is working steadily. About 15 men are employed there. Good cleanups are made every month; and it is only a matter of time when a large crew of men will be employed at this mine. There are about 30 men employed at the Marguerite mine below town at present. Fred Morris, the superintendent, is pushing things, and it will not be many weeks before the mill will be at work crushing rock. The Mountain mine is destined to be one of the best mines in the State. About 18 men are employed there now. In the spring the company expect to have over 100 miners at work. It is their intention to build a 40-stamp mill the first thing in the spring. Contracts will soon be let to build a tramway and other necessary improvements. The company that has hold of the mine has plenty of money; and, besides, they know how to manage a mine. The Buttes Saddle Co. have about 10 men at work in their mine at present. It is their intention to run a wire tramway from the mine to the Kentucky mill and crush what rock they can this winter. Both the Sierra Buttes and the Mountain Mine Cos. have made offers for this mine, but the owners do not seem very anxious to sell unless they can get their price, which, we understand, is $150,000. Of course, that sum is pretty large for an undeveloped mine. It is believed, though, that the mine will eventually fall into the hands of the company that is best fixed to work it—the Sierra Buttes Co. The party that leased the Colombo mine made a cleanup last Monday of between $900 and $1000, after about 25 days' run with only five stamps.

Siskiyou.

QUARTZ.—Yreka *Journal*, Sept. 4: John Boyle & Co. have finished crushing quartz at Forks of Humbug mill from their ledge at head of North Fork, with good success, the quartz averaging about $75 per ton. The mill is now engaged in crushing quartz from a new ledge on same creek, lower down, worked by Barnes & Co., which is rated as paying an average of $50 a ton. Spencer & Co. on Humbug are also taking out good-looking quartz, and expect to be ready in a short time to crush a large quantity. Several other prospecting parties who have lately opened new ledges and taken up old abandoned ledges, are getting out quartz to keep the custom mill going constantly day and night. The Hegler boys and Aldrich are also working their ledge energetically to keep their steam mill going, although water is very scarce.

HYDRAULIC.—Yreka *Journal*, Sept. 11: Hon. R. H. Campbell has been fixing up his ditches and pipes at Quartz Valley hydraulic mine, in preparation for coming winter season. If he can secure a good supply of water so as to work the giants from January to July, he will take out an immense quantity of gold dust, the past winter having been the lightest ever known in the way of water supply. The Allen Brothers' quartz mine in Quartz valley still continues to pay handsomely, with an abundance of ore in sight of same quality. Col. Williams and Geo. W. Osborne, mining experts from San Francisco, are now examining the quartz ledges on Humbug with a view of speculating in same, if suited. Barnes & Co. had a cleanup of quartz on Humbug last week and have evidently realized big pay, their amount of gold obtained being a profound secret.

Trinity.

LOWER TRINITY TUNNEL.—*Journal*, Sept. 7: Assessor W. C. Given gives us the following items in regard to the Lower Trinity tunnel: There are 16 men employed at the tunnel. The men were sinking below the dam; the top dirt had paid more than wages; the gravel, where the men were working, was paying $20 to $25 to the hand, and the bedrock had not been reached. It is Mr. Power's intention to prospect the river-bed as much as possible this season so as to be prepared to work to the best advantage. To date, the mine has more than paid running expenses, while the prospecting has been carried steadily on. The tunnel easily carries the river, and, at the present time, is not half full. The dam put in by T. J. McWorthy is a splendid piece of work, and is perfectly tight. The tunnel drains one mile and five chains of the river-bed, hence the company has many years of work before it with every prospect of large returns. Judging from the way the surface dirt pays, the bedrock should be very rich. Everything about the claim in the shape of pumps, etc., is in first-class condition and well arranged, and from present prospects the company has a good thing. The company also owns Taylor Flat—a mine which properly worked is bound to be a paying property. The water-right from French creek, which goes with the mine, is one of the finest in the county. The property is undoubtedly valuable, and in the course of another year will make a fine showing. Mr. McWorthy has a claim above the dam; a wheel above the tunnel raises water to run his sluices; a thin wire belt attached to the wheel runs to the opposite side of the river and is joined to a pump, so that the wheel raises water, runs the sluices and works the pump—a very ingenious adaptation of water-power.

NEVADA.

Washoe District.

UTAH.—Virginia *Chronicle*, Sept. 7: On the 600 level, the north drift is advanced 542 feet; formation vein porphyry and quartz. East crosscut No. 1 from the end of the main north drift is advanced 30 feet. Formation, porphyry streaked with quartz showing value.

CON. CALIFORNIA & VIRGINIA.—On the 1650 level. The stopes on the seventh and eleventh floors above this level continue to yield the usual quantity of ore of fair quality. Also continue stoping ore from upraise No. 2, carried up above the north drift from the bottom of the winze 60 feet below the end of the south drift. On the 1950 level from the incline winze sunk 99 feet on the slope below the track floor of this level. Are stoping ore

of fair quality upward and north and south from the winze bottom. During the week 1049 tons and 1990 pounds of ore were shipped to the Morgan mill, 1500 tons to the California. The average assay value of all the ore worked at these mills during the week, according to battery samples, was $27.65.

OCCIDENTAL CON.—During the week extracted and milled 442 tons of ore showing an average assay value of $18.16 per ton. Shipped to Carson Mint bullion valued at $13,059 and have sulphurets on hand valued at $10,000.

CONFIDENCE AND CHALLENGE.—The 500 level joint Imperial north drift is in 892 feet, the face continuing in quartz and porphyry. An east crosscut from this drift is in the same material.

UNION CON.—On the 1405 level west crosscut No. 2 from the north lateral drift is advanced 362 feet, from the south line, continuing in porphyry and clay with some water.

SIERRA NEVADA.—On the 520 level from the main east drift, 1185 feet from the shaft station, a south drift is advanced 45 feet. Formation porphyry with some water.

CROWN POINT.—The 700 level south drift is showing quartz. The 800 level south drift is in quartz and the west crosscut continues in porphyry and quartz.

OPHIR.—On the 1300 level the east crosscut from the shaft station, to connect with the raise above the 1465 level east drift, is extended 70 feet, face in porphyry.

HALE & NORCROSS.—Crosscutting the mineral belt stripped by the 300 level north drift has begun. The top of the upraise above the 500 level is still in ore.

SAVAGE.—The north drift from the upraise above the 500 level is still in low-grade ore. From No. 2 west drift on this level ore is being extracted.

MEXICAN.—On the 1465 level the north drift from west crosscut No. 1 is advanced 323 feet, continuing in porphyry and quartz.

GOULD & CURRY.—On the 300 level, the north drift from west crosscut No. 2 is extended 84 feet. Formation clay and porphyry.

BEST & BELCHER.—On the 550 level, the northwest drift is extended 98 feet. Formation porphyry and clay.

ALPHA.—The 382 level east crosscut is in low-grade quartz. The shaft is sunk 20 feet below the 500 level.

OVERMAN.—The north drift from the winze bottom is out 50 feet. Raise above west drift is up 229 feet.

IMPERIAL.—The 300 level north drift is out 495 feet from the south line; the face continues in quartz.

YELLOW JACKET.—Continue shipping 50 tons of ore daily. The 500 level west drift is out 590 feet.

NORTH OCCIDENTAL.—On the 400 level have begun stoping ore.

CHOLLAR.—The 850 level north drift continues in hard porphyry.

POTOSI.—The 850 level south drift is in a hard formation.

Como District.

CAUSE OF SHUT-DOWN.—Virginia *Chronicle*, Sept. 4: The owner of the Paymaster mine in Como is authority for the statement that the cause of the shut-down of the mines there resulted from dissatisfaction among Como-Eureka shareholders with the management. About $100,000 has been expended in developing that property, and the *Chronicle's* informant says there is plenty of ore in sight that could be profitably handled. He says he has a body of ore in sight in the Paymaster, but that he has expended $7000 in developing it, which exhausted his capital, and the shut-down of the Como-Eureka has destroyed the faith of moneyed men in that district.

Eureka District.

THE EUREKA CON.—Eureka *Sentinel*, Sept 7: There is a rumor afloat in town of an important strike in the Eureka Con. mine. It is said to be on the 800-foot level of the K K ground. We have no means of verifying the rumor. We have an idea that the strike is likely to be a good one. Al Burt, the foreman of the mine, has always had good faith in that portion of the company's ground. Burt is a first-class miner, and if given his own way about prospecting, and is allowed to push forward this character of work in the mine, which has not been attempted for two years, brighter days for the once famous bullion-producer are quite apt to follow. Good miners believe that there is much virgin ground in parts of the Eureka Con. which should be prospected. Burt, the foreman, holds to the same view. All sensible men know that ore cannot be found without running drifts. Burt has a theory that a drift started at the water level and extended out through certain unexplored portions of the K K would be productive of good results. In years past we have many times seen the Eureka Con. looking as though it was completely exhausted at all points, and a month later worlds of good ore in every part. This coming and going of ore deposits is a characteristic of our limestone formation. The new strike is encouraging, and we shall not be at all surprised if the old mine is as good as new in a brief period.

CHEAP ORE RATES.—Superintendent Gillman, of the E. & P. R. R., has been below for two weeks. He went down to secure a cheap rate for the transportation of Eureka ores to Salt Lake, if possible. We learn that he has succeeded. The new rate is something in the line of the schedule given in the *Sentinel* some weeks ago. It contemplates a sort of sliding scale according to the grade of the ore. Thirty-dollar ore and under is to be delivered in Salt Lake for seven dollars per ton. Between 30 and 50 a little higher rate will be charged. Above 50, the present rate is to prevail. This is a very important move for Eureka, and means, we believe, the beginning of a new era of prosperity in our district. We are assured that Salt Lake smelting men will construct sampling works here within the next 30 days. Now let prospectors go to work. The trust no longer owns the country.

Tuscarora District.

BELLE ISLE.—*Times-Review*, Sept. 6: North drift, 250-foot level, extended 20 feet.

DEL MONTE.—North drift, 225-foot level, extended 13 feet. The face looks favorable. Joint crosscut, 225-foot level, extended 15 feet; face still in vein. Main north drift on the 100-foot level extended 18 feet; face shows some high-grade ore.

NORTH BELLE ISLE.—The shaft has been sunk and timbered 18 feet; water remains about the same.

COMMONWEALTH.—150-foot level: Face of east intermediate drift from 15 upraise has been advanced 13 feet, in ledge matter showing good ore in face and top of drift. No hanging-wall encountered yet. 300-foot level: North gangway from the shaft has been extended 11 feet, through a hard porphyry formation.

NORTH COMMONWEALTH.—Joint crosscut, 225-foot level, extended 15 feet; the face is still in vein. South drift on the 100-foot level extended 19 feet; total length, 125 feet. The face shows about the same.

NAVAJO.—The crosscut from south drift, 350-foot level, extended 16 feet. Upraise south end, same level, extended seven feet. The ore is somewhat narrower.

GRAND PRIZE.—Water lowered 17 feet during the past week. Concentrator running steadily and doing good work.

Jumbo District.

A DRAFT AT THE WILD GOOSE. — Virginia *Chronicle*, Sept. 4: A draft of seven men was made at the Wild Goose mine September 1. There are still three men employed in the work of development. The owner of the Wild Goose had decided to drive a drain-tunnel about 1000 feet in length, that would tap the ground in the vicinity of the shaft, 200 feet below the present workings, which are on the water level, but owners of adjacent mining locations objected to his driving a tunnel through their ground, which will be necessary to get a sufficient depth for drainage purposes, and for this reason the project was abandoned.

ALASKA.

YUKON MINERS.—A story has been started that 400 miners were wandering about in Alaska, on their return from 40-Mile creek, and unless relief was sent, would perish of cold and hunger. M. R. Johnson of this city discredits the story and says: The diggings are on the banks of creeks which flow into the Yukon. All along the river from its mouth there are settlements, one of which is only about 100 miles from Forty-Mile creek. There are provisions in plenty, as, besides those the miners take with them, other provisions are furnished by two small steamers, one of three and the other of seven tons, which make trips up the Yukon. The miners can do no work in the winter on account of the freezing of the ground, and so they center from all the diggings at a settlement during the winter months, waiting for the ground to thaw out. Provisions are cached and stored at points along the river, so as to guard against the possibility of a shortage. The Yukon is closed for navigation by the ice in October and so remains until April. If any of the men desire now to leave the diggings, therefore, they can sail down the river. At the mouth of the river on the coast are some Indian villages, and not much more than 100 miles northward on the coast is St. Michael's, which is the general fitting-out point for the Alaskan miners. There the men could refit themselves or take the steamer for southern ports. It is 1000 miles from Juneau to Forty-Mile creek, where the diggings are, and the trip takes three months. That any of the men should have contemplated an overland trip to Point Barrow from the banks of the Yukon, is considered so preposterous as to be laughable by those acquainted with Alaskan territory.

ARIZONA.

MOHAVE MINE.—*Miner*, Sept. 7: Bolan & Barkel shipped this week a carload of ore from the old La Port mine, Mineral Park. The Keystone mill, Mineral Park, is running day and night on tailings. The following lots of ore, consigned to F. L. Smith, will arrive the first of next week: Indian Boy, one carload; Queen Bee, six tons; Sabbath Bell, seven tons. E. F. Thompson came in from his Empire mine, Chloride, on Tuesday. He is still pushing the north drift through good ore. The Little Boy mine, at the head of Todd basin, was sold on Friday last to Thomas Knight of San Francisco. W. F. Grounds of Music mountains has arranged his arastra for a constant discharge over plates. It is driven by steam, and with heavy drags he finds no difficulty in putting through two tons in 12 hours and works it up to 85 per cent. Supt. Genung of the Keystone mine, Mineral Park, is still sinking the Congress shaft near the mill. This is an immense ledge, and the action of the company in the past lends the impression that when crosscutting becomes necessary they will get tired before either wall is encountered. McCall & McKinnon have resumed work on their Sunset mine, Chloride, and have encountered a body of high-grade ore. Jas. Twiggs and Jack Kelly are drifting on fine ore in their gold mine near Cerbat. They have already extracted a large quantity of ore and will be able to put several men in the stopes when the drifts are completed. Supt. Bowers, of the Night Hawk, Layne Springs, reports the mine as producing some of the finest ore yet taken from the claim. The cost of sinking the last 50 feet was $25 per foot by contract, the mine furnishing everything except powder and candles. Geo. N. Conard, superintendent of the Little Boy mine, Todd basin, has a force of nine men at work making connection between the main shaft and lower tunnel, which will have to be driven about 250 feet, while the shaft will require to be sunk an additional 30 feet. It is the intention of the new owners to work the mine through the lower tunnel and thus avoid hoisting. A boarding and bunk-house for the accommodation of the miners is being erected. At the sampling-works during the past week the following lots have been run: Jesus Madrille, four tons from the Diamond Joe; F. Martinez, two tons from same mine; I. Hamlin, five tons lead ore; T. Myers, two tons from C. O. D.; W. E. Steadman, Daggett, six tons; Thos. McMahon, three tons from the Young Hyson; Geo. Miller, a lot of high-grade ore from the Weaver district; four carloads from the C. O. D. The sampling-works started to-day on 125 tons of ore from the C. O. D. The C. O. D. mine is looking good and employing about 50 men, though a considerable portion of that number are chloriders, who are doing remarkably well, while the company is taking out large quantities of ore from its reserves.

COLORADO.

NOTES.—Georgetown *Courier*, Sept. 7: A plant of machinery is being erected on the Orient. The Syndicate is working four men, prospecting the vein for ore. The Snider is turning out some very good ore. Five men employed. The Murray mine is to start up again, this time under the management of J. J. Yeckel. Water is being taken out of the Free America extension shaft for the resumption of work. The 60-foot tunnel on the Pioneer, Mill creek, is being put in shape preparatory to extending it 200 feet farther. The Jo Reynolds is erecting a new engine-house, 28x28 feet, and we understand a new and larger plant of machinery will be put in. The contract to sink the Schwartz shaft on the Red Elephant another lift has been completed, and the thirteenth level started. A crosscut has been started from the twelfth level to the Free America. Seven men are employed in the West Albro, and have two cars of ore ready for shipment this week, which mills well in gold, silver and copper. Covellite, an indigo-blue copper ore, occurs quite abundant in this mine in the form of a powder. The cost of producing an ounce of refined silver is from 75 to 80 cents; an ounce of gold from 10 cents to $1, according as it is free-milling or otherwise, so that the cost of production of gold and silver is no standard for estimating their commercial value. The Kaverne is being worked by four parties of lessees, employing nine men. The property is developed by a 300-foot shaft and two sets of levels, the lower one 200 feet from surface. The lessees are stoping from the second level up, and taking out ore milling from 3 to 4 ounces gold, 40 ounces silver and 9 per cent copper. The Mary Foster mine, Ute creek, is operated by the Yarmoth Mining Co. of St. Louis, under the superintendence of W. S. Swain. The company is said to be making extensive improvements and development. The following mines marketed ore in Georgetown during the month of August: Corry City, Kirtley, Everett, Burrell, Two Sisters, Pelican, Pay Rock, 7:30, Brown, Coin, Dunderburg, Dives, Virginia City, Jackson, Independence, Mendota, Luella, McClellan, Saxon, Native American, Comet, Glasgow, Backbone, Magnet, Hood Centennial, Silver Cloud, Mineral Chief, Hall, Hidden Treasure, Big Blue, Little Giant, Paymaster, Equator, Mammoth, Wyoming, Corvin, Illinois and Colorado Central.

DAKOTA.

TAILINGS SHIPPED.—Deadwood *Pioneer*, Sept. 4: Some 5000 pounds of Golden Reward tailings, assaying $20.60 per ton, were shipped from the site of the Deadwood reduction works a day or two ago. Tailings go to Denver, where they are to be tested in ton charges by the Newberry-Vautin process.

UNCLE SAM BULLION.—Dr. Harding and C. H. Lewis came over yesterday with a $9000-brick, representing cleanup from the 20 stamps dropping at the Uncle Sam during month of August. Developments at the mine progress satisfactorily, and more stamps may be dropping before Oct. 1.

SEABURY SHIPMENTS.—Deadwood *Pioneer*, Sept. 7: The Seabury-Calkins Co. shipped a carload of $70-ore to Kansas City yesterday, and have six more carloads on the dump and broke down ready to hoist. They have some difficulty in securing transportation from the mine to Whitewood.

IRON HILL. — Delay in arrival of slag pots ordered has prevented the plant blowing in for dry or pyritic smelter. All necessary changes preliminary thereto have been completed, however, and as Superintendent Bamberger has returned to camp, it is probable fires will be lighted in a few days.

CHLORINATION WORKS. — Krom rollers, purchased from the Welcome, have been placed at the Keystone Chlorination Works. The Harmony Co. has secured a 90 days' extension of its lease, and will resume treatment of ore on Monday next.

IDAHO.

COPPER.—Ketchum *Keystone*, Sept. 7: A. H. Dollarhide, the well-known mining man, returned last Sunday from a visit to the Samoa copper mining district, which is located near the east fork of Lost river. Mr. Dollarhide made a pretty thorough examination of the copper deposits of that district, and also informed himself in regard to the probability of silver-lead-bearing lodes existing in the vicinity of the copper camp. He says that the copper lodes or deposits are immense upon the surface, and the ores carry a large percentage of copper, besides a good percentage of silver with some gold. Plenty of timber and water close at hand afford every facility for reduction works near the mines. Mr. Dollarhide found no favorable indications of there being other mineral-bearing lodes in that locality, and thinks that the copper zone is a distinct formation by itself, and that the nearest silver-lead bearing mine is the Star of Hope, a distance of about ten miles from the copper mine, and of which he speaks very highly. The townsite of Samoa, which has been recently laid out at the copper camp, is in close proximity to the mines. Mr. Dollarhide estimates the distance from Ketchum to the copper mines to be about 40 miles.

BANNER.—Idaho *World*, Sept. 6: N. P. Fassett and son, Ed T., and C. Presswick, of the Elmira Silver Mining Co., returned Wednesday from Banner, where they have been the past few weeks, and left yesterday for their home in Elmira, N. Y. Mr. Presswick called on the *World* just before starting. He says the tunnel on the 400-foot level of the Crown Point and Wolverine mines has been driven 400 feet, all in pay ore, and the end of the chute has not been reached. They now have a seven-foot ledge that runs $70 per ton. A tunnel is being driven west from the 300-foot level into the Crown Point ground. This ground cannot be worked at present on the 400-foot level, on account of a big flow of water. The Co. has concluded not to put a new hoist on the Banner until next season. The Wolverine is now turning out ore faster than the mill can crush it, and there is enough ore in sight in this and the Wolverine to keep the mill going for a long time. Experienced miners estimate that the ore body already opened in these two claims, which are on the same vein, will yield $2,000,000.

LOWER CALIFORNIA.

COAL ON THE PENINSULA.—*Lower Californian*, Sept. 4: There is no doubt that coal exists in Lower California, for it has been found in small veins on the coast and also on the desert. The vein found at Sauzal is right on the shore, and not more than a foot in thickness. It has been examined by Engineer Tyzack and others, and assayed in Washington, and all pronounce it good coal. For years it has been well known that coal exists in small seams near San Felipe, on the Gulf, but no thorough prospecting has ever been done in that section, and it is therefore not known what we may expect. The officers of the U. S. Coast Survey steamer Ranger reported two years ago that they had found good veins of coal just below Point Canoas. Two different parties made the attempt to go and examine the district, but failed, and it is still unprospected and unknown. An old German geologist and coal expert has been wandering over the country between the pineries and the Colorado river, and he reports that a big coal measure is to be found south of the Cocopah mountains; and that he found coal beneath the dunes and shifting sands of the desert—all of which would seem to indicate that there is coal on the peninsula in paying quantities. While we do not credit the stories of gigantic veins 25 feet thick and 25 feet high, as late newspaper reports have it, we believe that experienced prospectors would be amply repaid for labor spent in finding coal; for a good coal mine here would pay better than an Alamo gold mine.

NEW MEXICO.

LAKE VALLEY.—Silver City *Enterprise*, Sept. 7: From Walter C. Hadley, manager of the Lake Valley mines, who is in the city, the *Enterprise* learns the following: The plant of the Lake Valley Co. is now running steadily, and treating about 60 tons of ore per day. The rolls have given place to the battery. Mr. Hadley has been experimenting for several months with the old lixiviation process, and has fully demonstrated a capacity of 60 tons. This has been accomplished without any direct appropriation from the company, and as it is now working successfully, the company will certainly supply the necessary funds to perfect the mechanical construction of the plant. Through this leaching process, an average of 83 per cent of the metal is now saved. The finest air-compressing plant in the Territory is now working in the mine. About 100 men are employed in the mines and mill, of which about 30 are leasing. The lessees have never met with very good success, although the average value of the ore shipped is from 75 to 83 ounces. One car of ore, besides that treated in the mill, is shipped every four days. A race with water is being run at the Graphic, Cook's peak. The new pump has a capacity of 8000 gallons per hour, and it is lowering the water slowly. The mine is opened up in good shape, and is more than paying expenses. The Oro Fino claim, in the Animas district, was sold last week for $20,000. Billy Purple, a deputy sheriff, was one of the owners. It was purchased by St. Louis parties. Clerk Webster is taking out some excellent ore from his Log Cabin mine, which promises to be one of the bonanzas of the county.

MONTANA.

HOPE.—Phillipsburg *Mail*, Sept. 7: It is now definitely understood upon good authority that the Hope mill will start up on the 15th, and will continue to run without interruption for some time to come.

GRANITE MOUNTAIN.—The output for the week ending Sept. 6 was 53 bars of bullion, containing 78,800 ounces fine silver and 166 ounces fine gold. The proposed ten additional stamps are being placed in mill B at Granite, which will enable them to work about as much ore as they do in the Rumsey mill.

COMBINATION CO.—The rebuilding of the hoisting works, etc., of the Combination Mining and Milling Co. at Back Pine, destroyed by fire last Saturday evening, will be commenced at once.

GEORGETOWN MINING AND MILLING CO.—An incorporation to be known as the Georgetown Mining and Milling Co. was organized in Phillipsburg during the past week. They have already commenced active operations on their properties, which include the Great Republic and Matildy lodes, adjoining the Red Horse in the Flint creek district.

LITTLE BLACKFOOT DISTRICT.—A. A. McDonald made a trip from Phillipsburg to the Little Blackfoot district this week, where he has lately become interested in the mines of that section. Mr. McDonald, like many others who have visited the camp, is highly pleased with the outlook. Men were put to work recently on the Emma and Carpenter lodes, which are among the claims that Mr. McDonald is interested in. A splendid showing of ore is in sight in the tunnel, and the owners are confident that they will eventually have a big mine. The Connor Bros. are the owners of another promising property in this district. All the ore in the camp is gold and silver bearing, and unusually high grade.

UTAH.

RUMORED STRIKE.—Park *Record*, Sept. 7: Rumors to the effect that a four-foot vein of clean ore was struck in the face of the south crosscut of the Anchor on the drain tunnel level the middle of the week were flying around town. In Salt Lake report had it that the ore struck assayed 70 per cent lead and 30 ounces silver to the ton, but the truth of this rumor could not be verified at headquarters. On authentic information the *Record* is able to state that the rumor is a little premature, and that the indications are considered so much more favorable that the vein is likely to be struck any day. When the Anchor vein is cut on the tunnel level this paper will say so.

THE GLENCOE TO BE WORKED.—Col. M. Shaughnessy, the principal owner of the Glencoe property, in Blue Ledge district, arrived from Salt Lake last evening. This morning, in company with C. P. Mason, manager of the Utah & Montana Machinery Co., E. A. Shear, the millwright, and L. W. Young of New York, went up to the mine. To the reporter the Colonel said it was the intention to resume work on the Glencoe shortly and build a concentrator to make marketable the great amount of low-grade ore in sight.

CAMP CROSSCUTS.—The Crescent tramway is running again in full blast. Ore was cut in the bottom of the Woodside shaft last evening at a depth of about 65 feet. The Mayflower and Woodside paid off their employes this week and Daly and Ontario pay-days are expected to occur within the next ten days. Some very encouraging developments have been made recently in Tait & McFalls' Aerial tunnel and in the New York group, which are above and southeast of the Ontario. It is calculated that the 3000-ton lot of Alliance second-class ore which is being sent down to the Union concentrator will yield 600 tons of concentrates worth from $60 to $75 a ton in the market.

MECHANICAL PROGRESS.

American Tin-Plate Manufacture.

There has been much discussion for several years past in regard to the practicability of establishing the industry of tin-plate manufacture in this country. It has been very generally conceded that the industry might be made practicable with a very small addition to the present tariff tax upon the imported article, but a few have argued that the business might be made profitable at the present tariff rate, and no doubt it might be if English manufacturers would stand at their present prices. But experience has shown that whenever any decided attempt was made to establish a new industry in this country, of which the English had previously held a monopoly, the American agents were immediately instructed to put down the price of the article to a much lower figure than it had previously been sold at, with the hope to strangle the new industry in its infancy. Manufacturers have often formed combinations and sold their goods in this country, under such circumstances, with transportation added, cheaper than the same goods were sold at home.

Under such a condition of things, the promoters of the new home industry have been compelled to exercise the utmost economy in the manufacture, and often are able to continue the business only through the invention of new and improved devices for carrying on the same. This was notably the case in the early establishment of manufacturing in this country soon after the war of the Revolution.

The recent discovery of tin in Dakota, however, with the still more recent demonstration of its great abundance and cheap product, seems to have infused new life into the efforts to establish the home manufacture of tin-plate. A company of capitalists has been formed in Pittsburg, Pa., which has commenced the erection of a plant, with a view of demonstrating the ability of the United States to manufacture tin-plates, the work upon which is being rapidly pushed forward. The subscribers are so confident of the success of the scheme that they have felt themselves justified in placing the matter in the hands of the American Tinned Plate Association to push the same to completion. A meeting has been held of those who have been practically engaged in the manufacture of tin-plates, both in America and England, to suggest methods for operating the plant.

At the coming exhibition of the Pittsburg Exposition Society there will be a practical demonstration of the process of the manufacture of tin-plates. The *American Manufacturer* thinks that the development of the industry in the States will have a great influence in inducing Congress to give it the protection asked for in the Senate bill, and which is necessary in order to establish the industry here.

A London (Eng.) contemporary laughs at the proposed exhibition of tin-plate manufacture at the coming Pittsburg Exposition as a "microscopical" affair when arrayed against the great tin-plate factories of Great Britain. "Let those laugh who win," and "he laughs best who laughs last," are old proverbs. If our statesmen are true to the people, the day is not far distant when foreign tin-plates will find no more markets in the United States.

Works for the manufacture of the plates to receive the covering of tin are already in operation at McKeesport, Pa., where iron plates of all descriptions will soon be turned out on a large scale. These works have recently been greatly enlarged, and two-thirds of the works were quite recently again put in operation, at which time the big new 44-inch plate-mill was put in operation also.

American tin-plate, when put on the market will be of a superior quality to the English plate, as it will consist mostly of steel-plate, which will be much more durable, and but little if any increased in cost. In this connection we notice the following from a Chicago paper: "The Illinois Steel Company, with its large capital will, at a day not very remote, enter upon the manufacture of tin-plate. This is proper. The tin in Dakota and at other places which exists in large quantities, is at last to be utilized, and Chicago is to become the center of the new and important industry. Besides the tin discoveries made in this country, it is well known that rich tin mines exist in Durango in Mexico, and when our own mines fail to yield a supply we can draw upon the rich lodes said to exist in the mines of our neigboring republic."

There were imported into this country in 1888 over 332,615 tons of tin-plate. This meant 900,000 tons of ore; 500,000 tons of coke for furnace use; 450,000 tons of pig iron; 1,250,000 tons coal or its fuel equivalent in the sheet and tin mills; 333,615 tons of sheet iron and sheet steel. As this is all labor it meant $30,000,000 of earnings that should have been distributed among American laborers.

The English paper above quoted need not be astonished if within three months after tin-plate has become an established industry on a large scale in the United States—as it is bound to be—the American processes of manufacturing the plates shall be far more simple, rapid, complete, and every way superior to the best methods now employed in Wales. The Americans are progressive, and brains and money are freely expended in providing all necessary improvements upon ordinary systems of production.

The Sheet Metal Manufacturers.

Improvements in the methods of manufacturing sheet-metal goods have made such rapid progress during the past few years, says the *Export World*, that many machines heretofore in general use and highly esteemed, have been replaced by others of still more improved design and construction and of increased efficiency, enabling the manufacturer to accomplish by machinery, with low-priced labor, far more and better work than was formerly accomplished with much high-priced labor by the inferior methods.

Many articles that were then spun by hand on a lathe, requiring an expert operator, are now cut and drawn into shape in one or more operations by a press and dies, with a rapidity, uniformity and cheapness impossible by hand-spinning. The use of heavy sheet brass and open-hearth sheet steel has become quite general in the manufacture of a large variety of small goods, formally made of malleable iron forgings or brass castings, and has improved the appearance and reduced the weight as well as cost of the articles.

In the manufacture of sheet metal goods, the machinery planned and constructed in the United States leads the world. Designs produced here have been copied in England, Germany and other European countries; but the development has been so rapid that it is noticed that by the time one machine is copied its particular pattern has been discarded for a better one, so that the European maker who attempts to keep abreast of those in the United States finds himself continually distanced in the race. Designs of most machinery for this line of manufacture are far less attractive in appearance and finish, have less symmetry, and the make does not always seem to be placed where most needed. This criticism applies to both English and German productions; and also, though to a less extent, to some French machines. It is, no doubt, because of superiority in design, construction and general efficiency that the demand for American presses has so largely increased in Europe during the past few years. Within two years a very large amount of sheet-metal working machinery has been exported to Great Britain, France, Germany, Holland, Italy and Russia, as well as to Australia and South America.—*American Artisan.*

POPULAR BELIEF THAT COLD MAKES STEEL BRITTLE.—Stuffe, Fairbairn, Kirkaldy, Webster, the United States Government Commission, the railroad commision of Massachusetts, and others, all hold that the effect of low temperature upon iron is very slight and that it does not tend to produce a brittle condition. Sanberg is the only one who claims that low temperatures have any pronounced effect in producing brittleness, that is, he is the only one among recognized authorities; but if you have ever been out in the woods on a cold, frosty morning, you may have noticed that the axman warms his ax before beginning work. Ask him why he does so, he will reply, "To take the frost out." Watch the trackman on on a cold morning; he is very careful not to strike his cold chisel too hard, and neither does he cut so deeply into the rail, before dropping it to break it, as he does in warm weather; ask him why, he will say, "the chisel and rail are full of frost and will brake more easily than in warm weather." The same thing will be noticed with the men who are unloading steel rails or wheels and axles. They are more careful to let them down easily in cold than in warm weather. You may say, "But that is a popular fallacy." It may be so, but those men have had some experience which has led them to this opinion, and I am afraid there is more truth than fallacy in their claim "that frost in the iron makes it brittle."—*Ramsay on "Effect of Cold on Metals."*

THE FUTURE OF THE STEAM ENGINE.—In a recent issue of the *North American Review*, Prof. R. H. Thurston of Cornell University, an authority on the subject of steam engines, expresses it as his opinion that this invention is capable of vast improvement, and that it has not yet begun to exhaust its inherent powers. On the basis of greater developments in the application of inventions to the steam engine, Prof. Thurston predicts that the next generation will see it consuming one pound of fuel per hour for a single horse-power; that ships of 20,000 tons will be driven at the rate of 40 miles per hour; that the American continent can be spanned by flying trains in two days, and that transportation between the cities of the Atlantic and those of the Pacific Coast will be so cheap that the general average of living will be vastly improved upon what exists today.

ECONOMY IN SPEED.—An experienced machinist says: "A shaft of half the weight, running at twice the speed, will transmit just as much power as one of full weight and slow speed. There is an actual economy of many items resulting from the use of shafting of small diameter running at high speed. There is economy in the purchase of the shafting; second, saving in couplings and hangers which will be lighter; third, pulleys transmitting a higher speed will be smaller, hence lighter; fourth, the belts traveling at high speed will be smaller and lighter; and fifth, the building supporting such light transmission can be lighter and cheaper, and there are many more advantages."

SCIENTIFIC PROGRESS.

*The Vital Theory.

It seems to be the tendency of the present scientific world to believe nothing which it cannot see. Therefore, its leading men deny the existence of certain laws and forces on the same ground that the unorthodox chicken took when it denied having been in a shell. In common with this idea, the dominant cultivators of medicine have decided that there exists no laws or forces in physiology or pathology which cannot be determined by physico-chemical processes. One of the recent writers, Gerold F. Yeo, who is Professor of Physiology in Kings' College, London, under the date of 1888, says: "The laws which govern the motions of inanimate bodies also control the actions of living tissues, for we cannot claim to recognize the existence of any laws affecting the human organization other than that known to be applicable to dead matter. There are a great number of activities shown by living textures which we cannot explain by the recognized laws of physics or chemistry. We, therefore, use for convenience sake the term 'vital phenomena' to indicate processes which are beyond our present physical and chemical knowledge. When physiologists make use of the convenient term 'vital phenomena,' it must be remembered that they do not thereby imply the existence of a special living force or any kind of energy peculiar to human creatures." Thus in a few words he outlines clearly and plainly the stand taken by his fraternity against the vital theory. Right here comes the cardinal point of differences in the belief of the regular and of the heterodox physio-medicalist. We believe there are laws which govern the functions and control the existence of living tissue which differ *toto cælo* from any that maintain power over dead matter. To deny the existence of such law or force because we cannot see it, chemically analyze or mathematically demonstrate it, is as foolish for scientists as it is for the Rev. Jasper to declare "the sun do move."

The human organism, and for that matter all living organisms, are built up and maintained in action by the vital force, living power, law of living tissue, or whatever you may choose to name it. Just what the force consists of I know not. It is inherent in the living tissue, and is, in fact, the one thing which constitutes the difference between a live body and a dead one. To it are the functional activities due. It is the stimulating power of the organism. Wherever we find life, be it animal or vegetable, from the undifferentiated protoplasm upward, we see the manifestations of this law. I cannot formulate it nor explain how it comes to be present in tissues any more than you can explain the *modus operandi* of crystalization which carbon passed through when the diamond was formed. When science is able to answer that question, it will be able to make living tissue at will.

In discussing this subject not long since, it was claimed that the progress of physiological investigation during the last few years had determined so many processes to be chemical which had been supposed to be vital, that we had good reason to expect that within a short time the mode of activity of living beings and the relation of living phenomena to the laws which govern them would be entirely settled on a physico-chemical basis. Anyhow it was maintained the discoveries made so far did away with any hope for the vital theory. If this were the case, there would be no more mystery concerning man's existence and the performance of physiological action than there is concerning the composition of water and the capabilities of its power. The working out of the chemistry of nutrition, of muscle or nerve waste and repair, of respiration, and of circulation helps, rather than retards, the vital theory. The existence of chemical laws in application to living tissue is not incompatible with the existence of a vitality which is separate from that produced by chemical combustions. It is not in the structure of tissue nor in the preparation of material for repair that the action of the vital force is seen. It is rather in the capability of tissue to carry on the merely chemical processes that it is to be recognized. The processes of nutrition which were long supposed to be vital are daily being turned into those of chemistry. But while we are learning the changes which food undergoes in order to be capable of sustaining our bodily existence, we have not learned how it is possible for these combinations to do the work and maintain life.

What it is that causes the parts of a living organism to undergo change into effete material, and what it is that gives to those parts the power of self-generation when new matter is presented under proper conditions, are questions that will never be answered by any physical or chemical experiment that it is possible to devise. No real progress has ever been made in science as long as the investigators have mistaken the effect for the cause. The analysis of the phenomena of physiology is not the investigation of their source. We can reason from effect back to cause; we learn by experiment that it is different from anything in the realm of physical science because there is nothing there that will produce the same results for any considerable length of time. There are forces in nature too delicate to be appreciated or seen save through external manifestations. That the vital power is one of these is proven in many places. Take, for instance, the experiments upon muscle. A muscle taken from a warm-blooded animal soon loses its irritability unless efforts are made to renew its functional activities, which may be done by passing an artificial stream of arterial blood through its vessels. The same result may be brought about by using a mild saline solution, say six per cent sodium chloride, but after these have been resorted to once or twice, the muscle loses irritability, or rather becomes completely fatigued—in a word, the muscle is dead. If the irritability is due, as many say, to the chemical action of the arterial blood, why does it fail after one short trial? Fatigue, or death, is produced, the anti-vitalists say, by the clogging up of the effete material produced by functional activity, and which have not been carried away. To the cleansing out of this matter they lay the efficacy of the irrigation with arterial blood or the salt solution. If irritability and fatigue, or in other words, life and death, depends solely upon chemical action or equilibrium of the blood in keeping a continual stream flowing so that the "fatigue matters" cannot accumulate, why does not the passage of this continual stream by artificial means serve the same end? The laws of chemistry are exact. If chemistry held the key to the solution of the problem, it would never fail. But what is fatigue? They answer, it is the loss of irritability—a mere negative term. What causes it? The clogging up by effete matters, the weakening of irritability. In short, when physico-chemical investigations have reached this point, they can go no further, but must tramp the same circle of function, irritability, fatigue, again and again. Is it any wonder, for here is the riddle of the ages. What is death? The absence of life. What is life? The state of an animal or plant in which its organs are capable of peforming their functions. There is the limit. What the difference is between live tissue and dead we know not, except that one is capable of work and the other not. What causes this capability is unknown, but it is beyond chemistry and physics. If there are no laws governing living organisms excepting those controlling dead matter, why are there such things as irritability and fatigue?

There is a law or force affecting living tissues which does not control dead matter, and that is the Vital Force. What it is, is undetermined. So far it has proven impalpable and unsearchable, but the difference between its existence and non-existence is the difference between life and death.

*By J. E. Roop, M. D., in the *Physico-Medical Journal.*

A CURIOUS CHEMICAL.—A new substance, singularly alike in its chemical nature and its properties, says *Nature*, has been discovered by M. Pechard. It is a mixed acid derived from oxalic and molybdic acids, and is, therefore, termed "oxalomolybdic acid." The crystals of oxalomolybdic acid, when dry, may be preserved unchanged either in sunshine or in the dark; but if moist they quickly become colored blue when exposed to the sun's rays. If characters be written on paper with the solution they remain invisible in a weak light; but when exposed to sunshine they rapidly become visible, turning into a deep indigo color. It is curious that this effect only happens when the solution is spread over paper or other surfaces; for the solution itsefs may be kept unaltered in the bottle for any length of time, except for a trace of blue at the edge of the meniscus, where, by surface action, a little is spread against the interior glass walls. If a sheet of paper be immersed in saturated solution of the acid, dried in the dark and then exposed behind an ordinary photographic negative, a very sharp print in blue may be obtained by exposure to sunlight for about ten minutes. The color instantly disappears in contact with water, so that if a piece of this sensitized paper be wholly exposed to sunlight one may write in white upon the blue ground by using a pen dipped in water. If, however, the paper with its blue marking be exposed to a gentle heat for a few minutes, the blue changes to black and the characters are then no longer destroyed by water.

SUBSTITUTES FOR LUMBER.—Two announcements were recently made in a single week looking toward a saving of waste, and provisions against a sure coming scarcity of timber. Our forests are unreasonably wasted; but man's inventive skill will meet the crisis successfully. One of these inventions provides for the making of sugar barrels of the refuse bagasse of the sugar factories, and the other for the making of boards of a mixture of reeds and plaster of Paris, shaped by hydraulic pressure. Here are substiutes for timber that suggest the possibility of many more; still there is no reform now more needed than to put an end to forest destruction.

SOLID SULPHURIC ACID.—Herr Bickmann has patented in Germany a process for enabling sulphuric acid for manufacturing purposes to be safely transported. He takes advantages of a property of certain salts—of which alkaline sulphates are representatives—by which they give up their water of crystallization when heated, and take it up again when cool; and he does so by mixing the salts in an anhydrous condition with a calculated quantity of sulphuric acid. The whole mass becomes granular, or may be formed into cakes, and when heated, the whole liquefies and may be used as if it were sulphuric acid, for the presence of bi-sulphate of soda does no harm.

GOOD HEALTH.

Want of Sleep.

Are you afflicted with insomnia? Perhaps you have too much time for sleep; perhaps you depend too much on sleep for rest and recuperation—for sleep is not the sole rest of used-up nerves. Sociability, congeniality, and the enjoyment of good company rest the body quite as much as sleep.

The dreary monotony of life in many a household, involving this tumbling into bed with the mechanical regularity of a machine at nine or ten o'clock in the evening, does not always rest weary bodies. "Early to bed and early to rise" does not always make a man healthy, wealthy or wise.

Numbers of organizations are capable of only five or six hours' sleep at a time, and their early lying down to rest is often succeeded by an early waking up and a consequent restless tossing for hours preceding daybreak. The practicers of punctuality are often surprised, after breaking their own cast-iron rules and passing two or three later hours of mirth and jollity past their usual bedtime, to find themselves even more refreshed than usual in the morning. The relaxation of sociability has rested them more than would sleep or an attempt to sleep. But these are conditions not so easily reached in the average family.

In fashionable life we have a formal, exhausting and mechanical evening of more or less dissipation. On the other hand the evenings of great numbers of families are monotonous humdrum. They involve the assemblage of the same people, the same surroundings, the same paterfamilias yawning over his paper, and the same querulous mamma overladen with family cares. Fresh people with fresh thought, fresh atmosphere, anything to stir up and agitate the pool of domestic stagnation, are sadly needed and sadly scarce. There needs to be also a constant succession of such fresh people to bring about these results. The world is full of men and women, and in a better regulated life it would be the business, after the day's work was done, to entertain each other and give each other fresh life. As it is now, hundreds and thousands of our households are little better than cells for the incarceration of each family. Thousands are thus worn out prematurely from the utter lack of domestic recreation. There might be written over the graves of thousands: "Bored to death by the stagnation of domestic life."—*The Christian at Work.*

How to Secure Pure Water.—The only sure way of securing pure water for drinking purposes is to boil it before using it. The *Medical News* of New York lately printed an exhaustive report on the efficacy of filters and other means to purify drinking water, by Dr. Chas. G. Carrier. It was read before the section of public health of the New York Academy of Science, and has been republished in a pamphlet. The author, who calls his paper a bacteriologicol study, makes several statements that may be familiar enough to students of science, but which are at variance with popular notions. Thus it is asserted that clear, sparkling water may be the most harmful of beverages; that polluted water may be agreeable to the taste and have no visible sediment, yet cause many deaths; that it may be highly colored, but showing no very large number of bacteria, and so be harmless to those who drink it. To detect the presence of harmful agencies in drinking water is practically impossible for more than one in a thousand. Therefore, when a given supply of water is found to be unwholesome, means to rid it of its dangerous qualities are peremptory, and the readiest appliances are filters, of which there is an immense variety. Or the water may be filtered on a large scale before it reaches the user's premises. Dr. Currier, however, points out that bacteria may find their way through any filtering material, and that the only sure way to have water that can be drank without risk is to boil it after it has been filtered. The muse is again snubbed by the man with the microscope, who shows slips in the teakettle between the old oaken bucket and the lip.

The Beer Drinker.—In appearance, the beer-drinker may be the picture of health; but in reality he is most incapable of resisting disease. A slight injury, a severe cold, or a shock to the body or mind, will commonly provoke acute disease, ending fatally. Compared with other inebriates who use different kinds of alcohol, he is more incurable and more generally diseased. It is our observation that beer-drinking in this country produces the very lowest kind of inebriety, closely allied to criminal insanity. The most dangerous class of ruffians in our large cities are beer-drinkers. Intellectually a stupor amounting almost to paralysis arrests the reason, changing all the higher faculties into a mere animalism, sensual, selfish, sluggish, varied only with paroxyms of anger senseless and brutal.—*Scientific American.*

How Women Rest.—How differently men and women indulge themselves in what is called a resting spell, says the New York *Graphic*. "I guess I'll sit down and mend these stockings and rest awhile," says the wife; but her husband throws himself upon the easy-lounge, or sits back in his arm-chair, with hands at rest and feet placed horizontally upon another chair. The result is that his whole body gains full benefit of the half hour he allows himself from work, and the wife only receives that indirect help which comes from change of occupation. A physician would tell her that taking even ten minutes in a horizontal position, as a change from standing or sitting at work, would prove more beneficial to her than any of her make-shifts at resting. Busy women have a habit of keeping on their feet just as long as they can, in spite of backache and warning pains. As they grow older they see the folly of permitting such drafts upon their strength, and learn to take things easier, let what will happen. They say: "I used to think I must do thus and so, but I've grown wiser and learned to slight things." The first years of housekeeping are truly the hardest, for untried and unfamiliar cares are almost daily thrust upon the mother and home-maker.

Yellow Fever.—The yellow fever is one of the varied forms of the typhus, the name being derived from the hue of the victim, while the Spanish call it *vomito negro*—the black vomit—from one of its symptoms. Its home is tropical Africa and tropical America, but it is never found in India and China, hot as the climate may be. The cause of this difference, however, has never been explained. Its greatest prevalence is on the sea coast or banks of navigable rivers. Its ordinary duration of attack is from 36 to 48 hours. The yellow tinge first appears in the eye and then spreads over the face, gradually reaching the extremities and often becoming dark brown. The rate of mortality varies in a striking degree, for in some places one-third of the cases prove fatal, while in others the mortality reaches two-thirds, and then at other times it has not exceeded three per cent. Treatment varies more in this disease than in any other, which is a proof that thus far it has baffled the best practitioners. Like all other forms of pestilence, it not only walketh in darkness but destroyeth at noonday.

The Health of Railway Men — The health of railway men does not seem to be a healthy, nor yet an enjoyable one, if any reliance is to be placed on the observations of medical men who have given some attention to the subject. According to M. Duchesne, railway men improve in health during the first four years, but at the end of ten years they are tired out, in 15 they are actual sufferers, and few can remain in the service after 20. These general conclusions have been supplemented by Dr. Lichtenberg of Buda-Pest, who found from examination that, out of 250 railway employes, 92, or more than a third, suffered from ear disease. Engine-drivers are especially liable to rheumatism and pneumonia, and after some years' service a certain proportion of them become dull of sight and hearing. Others suffer from a mild form of spinal concussion, muscular feebleness and continuous pains in the limbs. They are also apt to develop a peculiar mental state—a sort of cerebral irritation—with excessive nervousness and morbid sensation of fear.

USEFUL INFORMATION.

Mixtures for Brass Castings.

An English paper gives the following as the proportions of the different metals used for brass casting in a prominent English locomotive works:

Brass for side rods—Six pounds of copper and one pound of tin; to 100 pounds of this mixture add one-half pound of zinc and one-half pound of lead.

Brasses for driving boxes—The same as for side-rod brasses.

Some master mechanics prefer harder brasses, and call for five pounds of copper and one pound of tin, one-half pound of zinc and one-half pound of lead.

Bells—Four pounds of copper and one pound of tin; to every 100 pounds of this mixture add one-half pound of zinc and one-half pound of lead.

Castings subjected to steam pressure—Twenty pounds of copper, 1½ pounds of tin, one pound of lead and one pound of zinc.

Pumps and pump chambers—Eight pounds of copper and one pound of tin; to every 100 pounds of this mixture add 1½ pounds of lead and 1½ pounds of zinc.

Piston-packing rings—Sixteen pounds of copper, 2½ pounds of tin; to every 100 pounds of this mixture add one pound of zinc and one pound of lead.

To Make Wood Fireproof.—If this could be cheaply and effectually done, there are few improvements which would be more largely conducive to the welfare of mankind. The following paragraph, therefore, which has been lately in circulation, may be fairly pronounced "important if true, and interesting at any rate." It is stated that a New Englander has recently discovered a cheap method of dissolving zinc by combining it with hydrogen and producing a solution called zinc-water. This liquid, if applied to certain woods, notably white wood, makes it absolutely fireproof, and at a low cost. Mr. Edward Atkinson, the Boston economist, in speaking of it at Cornell University, says he regards this discovery as one of the most important of the age and one that will surely revolutionize fire insurance, as well as immensely decrease the losses by fire. The invention is kept secret for the present. Only one foreigner, Sir Lyon Playfair, the English scientist, knows of it. He corroborates all that is claimed for the invention, and says that the inventor is a bungling chemist, but that he has a faculty of blundering into the choicest secrets of nature's laboratory. As soon as patents are perfected and capital interested, zinc-water will become an article of commerce.—*Safety Valve.*

To Clean Engravings.—The *American Art Printer* gives two very simple and, as that journal says, very effective methods of removing all stains from engravings: Put the engraving on a clean board and cover it with a thin layer of common salt, finely pulverized; then squeeze lemon juice upon the salt until a considerable portion of it is dissolved. After every part of the picture has been subjected to this treatment, elevate one end of the board so that it will form an angle of about 45 degrees with the horizon. From a tea-kettle or other suitable vessel pour on the engraving boiling water until the salt and lemon juice are entirely washed off. The engraving will then be perfectly clean and free from stain. It must be dried on the board or on some smooth surface gradually, not by the fire or sun. Immerse the print for an hour or so, or longer if necessary, in a lye made by adding to the strongest muriatic acid its own weight in water, and to three parts of this mixture adding one of red oxide of manganese. India ink stains should in the first instance be assisted out with hot water, and pencil marks should be taken out with india-rubber very carefully. If the print has been mounted, the paste on the back should be removed with warm water. Another recipe is: Lay the engraving down on a smooth board with a clean sheet of paper underneath, and with a clean sponge and water wet the picture on both sides and then saturate it well with a soft sponge with the following mixture: A quarter of a pound chloride lime, two ounces oxalic acid and one quart of soft water, and apply.

Curious Growths.—The editor of the Manchester (Mass.) *Mirror* says that Chas. Walker of that place has a curiosity on his grounds which would seem to be a miniature rival to the famous hanging gardens of Babylon. In one of the grand old elm trees which surround his home, and at a distance of about 13 feet from the ground, may be seen growing a currant bush in all the pride of richly-borne fruit. The bush was first noticed in the fork of the tree about three years ago, and this is the first year that fruit has appeared. It must have grown from seed which was carried there by a bird. Another exchange says that a tree was recently felled in the courthouse yard at Johnsberry, Vt., which had a gooseberry bush growing out of its side, upward of 30 feet from the ground. The tree was a maple and the strange growth had been noticed for a year or two, but the precise character of the growth was not known until the tree was cut down.

The Keeley Motor is still on the way. It is estimated that not less than $300,000 have been spent in the work of Keeley's motor, and the end is not yet. Keeley says he has nearly completed what he calls his "provisional engine," and will soon be prepared to make it known and to apply for patents. Meanwhile, the courts having decided that Keeley cannot be compelled to disclose his secret before it is protected by a patent, the stockholders are left to rely entirely upon his promises. He says he has written out his secret so that it may not die with him.

Sawdust Paper.—An important experiment has been made successfully at Ottawa, Ontario. A mill has been established which makes paper pulp out of sawdust. It is now using all the product of one mill. The paper made wholly from sawdust is said to form an admirable sheathing, that is fit for building after being tarred and dried. A better quality of paper is made by using one-fourth waste paper. The plant cost $15,000 and consists of American machinery. The mill has a capacity of converting about 12,000 tons of sawdust into pulp annually.

A Valuable Invention.—It is said that the Secretary of War at Washington recently became so greatly impressed with the value of an original invention (an instrument known as the "hitch-lock"), that at his special request it was hurried through the patent office. Its importance lies in the use to which the Government can apply it. Attached to a telegraph line, any electric message can be sent over the wires to its destination without being heard at intervening stations, and Government secrets cannot be interpreted.

Platinum can be Made to Adhere to Gold by soldering, in the following manner: A small quantity of fine or 18-carat gold should be sweated into the surface of the platinum at nearly a white heat, so that the gold shall soak into the face of the platinum. Ordinary solder will then adhere firmly to the face obtained in this manner.

English and American Capital.—It is announced that while English capital is being absorbed in large American industries, American capitalists are trying to establish a new express and baggage company in Europe. New Yorkers will build a new theater in Paris, and Brooklyn capitalists will erect a hotel in the same city.

ELECTRICITY.

Profits from Electric Enterprises.—As an evidence of the large legitimate profits to be made in electrical enterprises under competent and judicious management, the *Electrical World* instances the case of an electric light and power company established in a city of over 100,000 inhabitants. Some five years ago the company was formed, contracts were signed and the stockholders assessed $80,000 in actual cash to pay for the complete installation, which was then placed in the charge of a young man of known ability, to whom no other instructions were given than to secure the largest possible dividends. The capital stock was then $100,000; within two years it was doubled, and later on was raised to $300,000, though the stockholders have never paid in a dollar other than the first subscription of $80,000. An offer of $260,000 in spot cash has been made for the complete plant, and the average yearly net profits divided during each of the last four years has equaled the original cost of the plant. In other words, were they to sell out for the sum named they would have received a total of $580,000 upon an investment of $80,000 made some five years ago. "Is it to be wondered at," remarks our electrical contemporary, "that capitalists stand ready to invest in any legitimate electrical enterprise? Should the unprecedented activity in electrical circles be a matter of wonder? Even if arc lights do not earn as much now as they did five years ago, the industry is evidently one capable of good returns."

A Magnetic Field.—If, while the electrical current is flowing through a wire, a delicately poised magnetic needle be carried about it, the needle will tend to place itself at right angles to the general direction of the wire. It may be easily shown that the region about the wire is a magnetic region, commonly called a *magnetic field*. In order to do this, the wire may be made to pass vertically through a sheet of smooth paper which is held in a horizontal position. If, then, while the current is passing, some iron filings be sprinkled over the paper, and the latter be gently tapped, so as to assist the movement of the filings, they will arrange themselves in concentric circles about the wire. When the current is interrupted, the region about the wire is no longer a magnetic field, but it may be restored as often as the current is renewed. This simple experimental fact lies at the foundation of many electrical appliances with which we are familiar. The magnetic field about a single conducting wire is, however, generally too feeble to serve for many purposes for which it would otherwise be useful.—*Prof. C. F. Brackett in Scribner's.*

Electricity at the Eiffel Tower.—M. De Fonvielle has made very curious electrical experiments at the summit of the Eiffel tower. Some, it is considered, will lead to important considerations of a scientific character, which will be continued; others are of a more practical character. The atmosphere round the tower at this elevation is free from all influence of the soil, as would be the case at the top of a mountain, and the air is in an extraordinarily active state of electricity. The tower will, it is said, be the most perfect conductor of electricity during a storm, and all within it will be in a state of entire immunity against all danger from lightning. The electric beam from the Eiffel tower lantern has a luminous intensity of about 55,000 candles. Catadioptric rings are arranged to make the light stronger and stronger as it travels from the tower, so that in clear weather its range—if not limited by the earth's curvature—should be 127 miles, with an intensity of 5,000,000 candles.

The Electroscope.—The most astonishing claim yet made in behalf of electricity is that we can see distant persons and places by its aid. There is an apparatus called an electroscope which accomplishes this seemingly supernatural feat. A public test of this instrument before many scientific men showed a race course, 40 miles distant, plainly projected on a large disk of white burnished metal. Each detail stood out with perfect clearness, and even faces could be distinguished. Think of the possibilities of this invention! In the near future, friends separated by hundreds of miles may not only hear each other's voices by telephone, but also see each other's faces by the electroscope.—*Exchange.*

The Electric Welding Patent in Europe. It has been reported that the foreign electric welding patents were bought from Prof. Thomson for $750,000 by the syndicate, who sold them to the Thomson European Electric Welding Co. for $1,500,000. The stock, at 125, represents no cash in the company's treasury, simply the patents. The new addition of $100,000 is to be working capital. The company will do no manufacturing, but will sell rights to foreign countries.

New Fields.—Electricians are still finding new fields of employment for the subtle fluid. The latest is a new method of communication. By it a man can sit at his desk in New York, and the letter he writes with the electric pen is instantaneously reproduced in Boston, St. Louis, Chicago, or any point with which he wishes to communicate.—*Progressive Age.*

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Business Announcements.

[NEW THIS ISSUE.]

Metallic Alloys—Henry Carey Baird & Co, Philadelphia. Mill for Sale—R. A. Varden, Parral, Chihuahua, Mex.

☞ *See Advertising Columns.*

Passing Events.

The Bimetallic Congress was opened this week at Paris. There are 170 members present, including 23 representatives of European and other Governments. The president referred to the disastrous results that would follow if America should abolish the Bland Act and the Latin Union be denounced. Such action on the part of America, he said, would lead to a commercial catastrophe that would affect the whole civilized world.

A letter from the First Assistant Secretary of the Treasury to Salt Lake parties is to the effect that a duty will be collected of $30 per ton on all ores containing lead, either in argentiferous, copperous or gold ores; the value will have no longer anything to do with it. The circular will be explicit. It will state that ores of "lead mines," no matter how little lead they might contain, if the lead is saved by smelting or any other process, the importer of the ores must pay duty of $30 per ton. This ruling (if approved) gives to the miners of Utah, Idaho, Montana, Colorado, Nevada and Wyoming all that they have asked; it simply puts into effect the law.

The most severe storm in 50 years swept over the Atlantic Coast this week, destroying an immense amount of property on shore and wrecking a number of vessels.

The discovery of diamonds in Mexico, spoken of in the PRESS a few weeks since, seems to have been confirmed, if reports in the Mexican papers are authentic.

The Russian Rouble and Silver.

Several times reference has been made in these columns to the Russian rouble in connection with the silver market and its bearing on the market value of wheat. The rouble is the chief metallic currency of Russia, and, being a silver coin, its value in other countries is based on the price of the bullion, unless there is a political disturbance, when its market value is largely depreciated below that of silver. The rouble has such marked fluctuations in the money markets of Europe that it necessarily must be largely dealt in. A short review of the more decided changes will undoubtedly prove of interest at the present time.

Just before the Crimean war the quotation of the rouble in London was 3s. 2¾d. This war of course caused a fall in its market value, but subsequently there was a recovery. Just before the Russo-Turkish war the quotation was 2s. 9d. The disturbances in the Balkan peninsula and the conflict between Russia and Turkey caused another heavy fall; then followed a slight recovery and a certain degree of steadiness, which was afterward succeeded by a gradual settling in prices. The decline, with slight reactions, continued until well into last year, when the low price of less than 1s. 8d. was quoted in London. This shows a decline since 1852 of nearly 50 per cent. More than one-half of the decline can be attributed to the depreciation of silver; for, although specie payments are suspended in Russia, it is not to be left out of sight that the rouble is a silver coin. The remainder of the decline is due to the political condition and policy of Russia.

During the Russo-Turkish war the credit of Russia fell so low that she was unable to borrow abroad, and consequently one means of defraying the cost of the struggle was to issue a large quantity of notes. This necessarily had its effect on the rouble, which depreciated to such an extent that the Russian Government ordered repayment to the Imperial Bank of Russia of the extra issue of notes caused by the war, and their cancellation. Although the payments were made, yet there was no cancellation of notes. In fact, the financial difficulties of Russia have been so great ever since, and its credit so low, that it has been unable to meet its liabilities abroad except by the sale of roubles, which it adopted since the Russo-Turkish war. These forced sales have created quite an active trading in them in the European money centers, particularly in Berlin. The roubles are purchased at a depreciation and used in the payment for wheat, coal oil, and other articles of Russian exports. That large quantities of roubles are from time to time put on the European market can be readily seen when it is recollected that Russia has to provide in sterling for the payment of its debt held abroad, and it is also to be borne in mind that it has to make many large contracts in foreign countries for military purposes. It is not to be supposed that the military preparations that have been going on for several years past, and the vast concentration of troops that has been taking place in Poland and other military objective points, can have been accomplished without very large contracts having been placed abroad, and these contracts would have to be liquidated, in large part at least, in coin. The greater part of the Russian taxes, however, are received in paper money, and Russia consequently has not the means of meeting its engagements except by constant borrowing and therefore the selling of roubles to meet maturing obligations abroad.

The rouble, like India council bills, has a decided effect on the price of silver by curtailing the trade call for the bullion to meet, as stated above, purchases of wheat and other export commodities from Russia. By depreciating silver and thereby lessening the value of the rouble, Germany inflicts a serious financial loss on her feared enemy Russia, and consequently does no little in keeping the latter power in check.

ADMISSION DAY was celebrated in various parts of this State on Monday, the main event being the general meeting of the Native Sons of the Golden West at San Jose, where appropriate ceremonies were conducted.

IT is generally expected that Secretary Tracy will recommend to Congress an appropriation of about $500,000 for putting shipbuilding plants into the navy-yards.

Big Gold Bars.

An item has started the rounds of the press taken from the Montana papers that the largest gold bar ever made in the world has just been cast at the U. S. Assay office in Helena, Montana. The bullion came from three mines, the Spotted Horse, Drumlummon and Jay Gould. In shape it is a section of a pyramid, the base being 18x7½ inches high, and top surface 17x6 inches. Its weight is 6945 ounces or about 500 pounds avoirdupois. Its value is a trifle over $100,000. The bar was shipped to Minneapolis to be placed on exhibition at the exposition there. As soon as the exposition at Minneapolis is over, the bar will be reshipped to New York and placed on exhibition in that city. The display will consist of four bars of lead for a base of the monument, four bars of copper for a second course, four bars of silver for a third, and on top of the whole to rest the $100,000 gold bar, and the monument will be surrounded by specimens of quartz and ore from all parts of Montana.

This will be a first-rate monument of Montana's mineral resources, but the claim that the bar is the largest ever made is incorrect. One was made in this State in 1882 by the North Bloomfield Mining Co., worth $114,000.

The writer of these paragraphs had the pleasure of seeing that bar at the time. Its weight was 511½ pounds troy. The length was 15 inches, width six inches, and depth seven inches. It contained 630 cubic inches of gold, worth about $19 an ounce. The mold was cast at the Nevada City foundry from iron produced at Clipper Gap, in this State. The dimensions of the mold were: on top, 17 inches long and seven inches wide; on bottom, 16 inches long and six inches wide. It contained 715 20 100 cubic inches. The thickness was three-quarters of an inch on the sides and one inch on bottom.

It was in 1873, if we remember aright, that the Spring Valley Co., this State, sent down to this city a bar worth $41,000, which they thought was the largest ever made. At the request of the company we made inquiries and found one had been received here from Helena, M. T., worth an even $50,000, and several others worth $35,000, $41,000 and $40,000 had been made. The Spring Valley Co. (Cherokee Flat, Butte county, Cal.) then made a 35-day run with 1000 inches of water, and with a partial cleanup of 800 feet of head flume and 14 undercurrents, produced a bar worth $71,273, weighing 299 pounds. Then they shipped another worth $90,000.

The North Bloomfield hydraulic mine then made a run and turned out the biggest gold bar ever made, worth $114,000. This all came from one run of one mine, and, notwithstanding the recent Helena bar from three mines, still remains the largest ever made. There is a model of the bar in the museum of the State Mining Bureau in this city.

Connecting Mine Cars With Ropes.

Cuts on page 201 show several methods adopted for connecting ore cars with the wire ropes which move them through levels or on inclines. The first three figures show three devices which have been used with satisfaction when operating a "side entry," where it is customary to facilitate disconnection from the hauling cable by employing what are known as "knock-off" links. In the counter-rope system, where there are two engines, one in the mine and one out, alternately pulling a train of cars in and out by two ropes, the ropes are connected end to end by means of a chain, as shown in the fourth cut. The number of these connections varies according to the length of the train. The next cut below shows a shackle joint, which is frequently used in making connections between sections of rope in various wire-rope haulage systems. The sixth and lowest of the engravings illustrates the most approved designs of swivel-chain connection between the wire rope and cars on inclined planes.

THE statement of the Boston Montana Consolidated Copper and Silver Mining Co. for one year ending June 30th shows a mining profit of $1,014,917.

TIN IN NEW MEXICO.—It is stated that tin ore has been found at the mica mines near Tres Piedras station, in Rio Arriba county, N. M.

Pan Amalgamation.

(*Continued from page 201*)

usual manner. The pulp from the batteries is then conveyed in pipes to the special grinding pans, placed immediately below and in front of the batteries. In these pans all grinding of the pulp is done, the product of ten stamps passing through two in succession. From the grinding pans the pulp is discharged into the first amalgamating pan at the end of the line and then flows continuously through the line of pans and settlers, they all being connected together by pipes near the tops of their sides. The pans are charged with quicksilver by means of pipes leading from the distributing tank, and the amalgam is drawn off through pipes to the strainers. Here a quicksilver elevator lifts the strained quicksilver back to the distributing tank and all handling is thus avoided. Two chemical feeders working automatically supply the chemicals to the pans at such intervals as may be desired. From the last settler the tailings are run off or led over concentrators. The pans and settlers are all placed upon the same frame and on the same level and each is driven by means of gears brought into action by a friction clutch fitted to gear on the main line shaft. Each pan and settler being thus provided with a separate clutch, any pan or settler or any number of either can be stopped independently of the others in case of accident or for cleaning-out purposes. In order to secure the continuous flow of the pulp through the line when one or more pans or settlers are stopped, steam siphons are provided for carrying the pulp past them and cutting out for repairs or cleaning.

All the water from the batteries must pass through the pans so that all slimes are treated; there is less loss of quicksilver; a true sample of tailings may be taken, while by the old method this is impossible.

Generally speaking, it may be stated that any ore adapted to pan treatment can be more successfully and economically worked by the "continuous" system of pans than by others, in addition to the saving effected in any first cost of plant and subsequent maintenance.

A Remarkable Silver Mine.

The mine belonging to the Broken Hill Proprietary Co., Limited, on the Barrier Ranges silver-field, New South Wales, is a wonderful one. It is in charge of W. H. Patton, formerly of the Comstock. During the past six months there has been extracted from the mine 67,741 net tons of ore, yielding 2,677,686 ounces silver and 11,418 tons of lead, or an average of 17 per cent lead and 39.38 ounces of silver per ton of ore treated. This ore has been mined and put into the surface bins (including all deadwork) at an expense of £1 1s. 3d. per gross ton, and the cost of smelting, during the past six months, has been at the rate of £1 13s. 10d. per ton.

The total number of employes on and in the mine is 2127, a fact which in itself shows the magnitude of the operations. In the mine proper, not counting any others, there are 1416 men, and there are 354 connected with the smelting department. In general construction and repairs 337 are employed.

For the half year they smelted 68,545 tons of ore. In doing this they used 15,866 tons of limestone, 11,232 tons of coke. The amount of flue dust treated during the half year was 804 tons, containing 241 tons lead and 8040 ounces silver. Deducting this amount from the totals of the above table leaves 70,162 gross tons, equals 67,741 net tons of ore as the amount of ore actually treated.

The cost of smelting has been 33s. 10d. per ton. During the half-year, £240,000 has been distributed in dividends, paid monthly, being equal to 30s. per share of £2 each, and the directors expect to immediately announce a satisfactory increase in that direction. The amount of £40,862 1s. 5d. has been spent on construction account, and at the close of the half-year, after providing for all outstanding liabilities, there are surplus assets in cash, stores, and bullion on hand, representing a value of £100,431.

The total amount of dividends, bonuses, and additional shares allotted to shareholders since the formation of this company is £3,128,000.

The ore reserves have been added to this year, notwithstanding the draft of 67,000 tons extracted.

Construction of Maps in Relief.

The practical use to which topographical models or relief maps have been put has within the last few years taken a wider range. They are rapidly coming into favor for other than purely scientific purposes, and their value for illustration and instruction is being more fully appreciated. Topographical maps, representing by contour-curve lines the elevations and depressions of the earth's surface, are now demanded in engineering work of nearly every description, and afford a ready means of bringing out the configuration of the country in a simple manner.

By reason of the inability of unskilled persons to understand the nature of a topographical map, it is sometimes necessary to construct the same in relief, with the rivers, canals, railroads, etc., delineated upon it. With the aid of such a map, problems in engineering science, which would otherwise require expert assistance to explain them, are reduced to a simple and understandable form.

Relief maps are also of value to the geologist in working out the geological structure. To the instructor they present the most ready and efficient means for imparting clear and accurate knowledge of topography; and they are invaluable in courts of law. The best one of this kind in California is that at Prof. Davidson's office, which is a relief map of the Pacific Coast, showing the mountain ranges, lakes, rivers, bay and coast line. From this we have had made a large photo-facsimile chart on a reduced scale from the original.

There are various methods of construction, and a description of some of the forms employed may be interesting, especially to mining engineers and superintendents who may desire to make such maps of the country about certain mining properties. John H. and Edward B. Harden of Philadelphia have written a paper for the American Institute of Mining Engineers describing the construction of relief maps, from which we make the following extracts: A contour-line map, or one on which the elevations are marked at numerous points, is the first requisite in relief-map making.

One of the earliest methods of constructing these maps is that of drawing section lines across the topographical map (in intricate topography, also at right angles, as in Fig. 1) and transferring these lines to thin boards or metal strips; the hight, as shown at the point crossed by each contour, being measured from the base of the strips, and the profile thus obtained cut out. The position of these section lines is transferred from the map to a base-board, as a guide to adjust and fasten the profile strips.

Fig. 2 shows the topography of the map (Fig. 1) drawn on profile strips in one direction only. Fig. 3 represents the same and with profile strips also at right angles. The model of the squares so formed may be filled in with wood or plaster.

Another method is to make a tracing on cloth of the contour map, and this is laid on a block of plaster, and with a pointed instrument contours are transferred to the plaster before it has had time to dry thoroughly. Then begin at the lowest contour and cut the plaster down to the desired level, this being determined upon by means of a sliding scale for measuring vertical elements.

A method similar to that described by Prof. King was practiced by Prof. J. P. Lesley, at the University of Pennsylvania. Instead of using one solid block of plaster, a number of blocks of uniform size to cover the area of the map were taken, and a profile was drawn upon the sides of each block. They were then carved down to these lines, the space between the profiles being shaped by the eye.

One of the early models made in this country, that of the Morrison's Cove region, Blair county, Penn., was constructed by Prof. Lesley on this plan, the blocks being of wood, three inches wide, and was carved with woodcutters' tools. Fig. 4 is an illustration of what may be done by the block method of construction, the two blocks shown being taken from a large model of Blair county, Pa., made by one of the writers. The geological structure is shown in section on the sides of the blocks.

The method preferred by the Messrs. Harden, and the one that has given the most satisfactory results in their hands, both as regards accuracy and ease of manipulation, is that of cutting out the contours on wood of the proper thickness to represent the vertical interval selected, building up and finishing in wax.

Having a base-board one inch thick, with one planed surface, and the exact dimensions of the intended relief, either paper, card-board, strawboard, or wood of a proper thickness to represent the contour curves, is used to build up the model. Having at hand transfer paper, stylus, hammer, wire nails, glue and a jig-saw, you have all the material necessary to begin work. Suppose the scale of your map to be 1–19,200 of nature, or 1600 feet to the inch, and it is decided to build up the steps representing 50 feet vertically, then the material should be 1–32 of an inch thick. Lay your map upon the base-board and transfer to it the outline of the first 50-feet contour. Transfer the same outline to the material selected for the building up of your relief, and also the outline of the 100-feet contour as a guide for the position of the next layer. With the jig-saw cut to the outline of the 50-foot contour, then fasten it to the base-board with glue and nails in the position marked for it. Proceed in like manner to transfer the outline of the 100-feet contour, and make marks for the adjustment of the 150-feet layer; saw out the 100-feet line and nail it down.

Proceed in this way to the greatest elevation of the relief, always marking your material with two lines—one for cutting, the other for a guide for the position of the next layer above. Should the final layer, representing the tops of the hills, be less than 50 feet, it may be rubbed down with sandpaper to its proper hight. When this is complete the relief appears in terraces one-thirty-second of an inch in hight, each step representing 50 feet and corresponding in outline to the contours at 50, 100 and 150 feet, and so on to the highest elevation, as shown in the cardboard model, illustrated in Fig. 5.

If wood is used, each alternate layer should be laid down with the grain at right angles to the preceding layer, to counteract the contraction or expansion of the wood, which will otherwise seriously interfere with the accuracy of the result. It is also necessary to take precautions to prevent the pasteboard giving trouble from the same defect.

Should the model, after finishing, be cut along certain section-lines to exhibit the geological structure, these lines should be marked upon the map and transferred to each layer at the same time as the contour lines, and when nailed down care must be taken to keep the nails far enough away from these lines to allow the saw to pass.

The model is now ready for the waxing process. For this purpose the following formula is recommended:

Beeswax, 16 parts; Venice turpentine, four parts; cornstarch, eight parts; Venetian red, one part; sweet oil, one part.

Melt the wax, add the Venice turpentine, and sift in the cornstarch, stirring the mixture thoroughly, after which the Venetian red or other coloring matter may be added, together with the sweet oil. This preparation, poured into flat dishes, and allowed to cool, is used to fill up the angles or steps.

The skill of the topographer now comes into play in forming the finer details of the topography from the map, between the successive steps

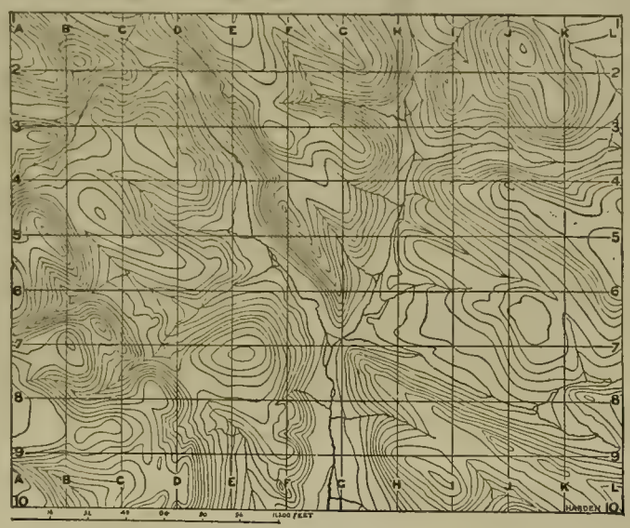


Fig. 1.—SOUTH MOUNTAINS, PA., FORM GEOLOGICAL SURVEY MAPS.

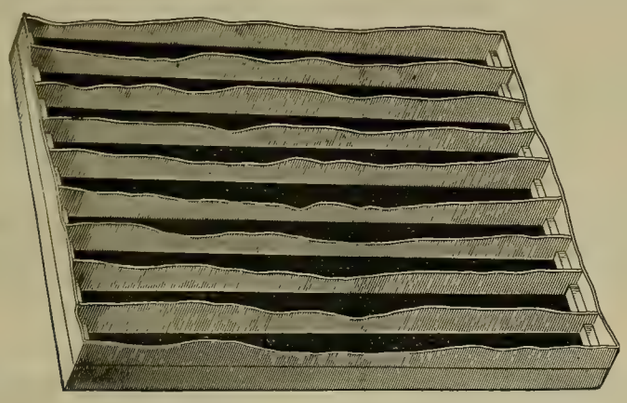


Fig. 2.—METHOD OF MODELING BY SECTIONS IN ONE DIRECTION.

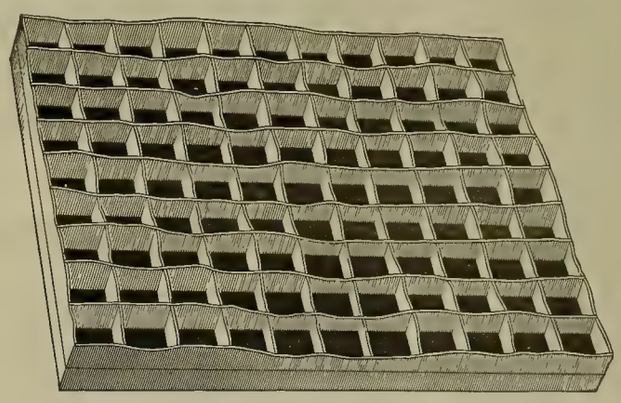


Fig. 3.—MODELING BY SECTIONS IN TWO DIRECTIONS.



Fig. 4.—WOODEN BLOCK MODEL OF GEOLOGICAL STRUCTURE.



Fig. 5.—MODEL MADE IN CARDBOARD.

formed by the boards, it being assumed that the orginal is in contours ten feet apart; and it is in this part of the work that the mere mechanic fails. The tools employed are of various rounded forms and sizes, to suit the intricate shapes of the finished model. They can be made of hard wood or bone. The wax should be of a consistency to work easily, which can be obtained by regulating the quantity of sweet oil in the above formula.

In some first attempts by one of the writers, a mixture of tallow and resin was used to cover the wood before applying the wax. In practice this was found unnecessary, the wax adhering to the wood without it. A little sweet oil used on the tools when giving the final touches, will be found advantageous.

If the above method of waxing is followed, the relief may be kept for years without danger of separation from the wood; or it may be finished for immediate use when time is an object. Usually, however, the wax relief is only used to cast a mold in plaster, from which any number of duplicates can be made. At this stage of the process help may be had from a plasterer, who will cast copies for a small sum, depending upon their size. When a modeler desires to make his own casts, it may be done in a manner which will be described in next week's PRESS.

A Rich Mineral Belt.

If any one capable of canvassing the matter, says the Homer *Mining Index*, will take the trouble to thoroughly examine the ground along the summit ridge of Prospect mountain, between Mill Creek canyon on the north and the old Dick Turpin ledge on the south, he cannot fail to conclude that this mineral belt is one of remarkable continuity in the production of free gold-quartz, as nearly "free" as any other district can show.

There is no chance for doubt or speculation about the great dimensions of the ore body in the channel that traverses the mountain from one end to the other unless we unwisely assume that metal-bearing rock abruptly disappears at the depth of 700 feet below the croppings, which is the deepest point to which the hill has been penetrated, and that in the May Lundy mine.

For a distance of nearly two miles the quartz seldom fails to afford a good prospect, whether taken directly from the ledges or pricked up as float. Throughout the system of north and south veins with which the mountain is ribbed, a barren ledge cannot be found, while in places along the croppings—and these not very far apart — the protruding quartz is thickly speckled with gold.

All the mines located on and along the ridge are, without exception, valuable properties, and should be producing gold in large quantities, instead of being in a stale and unprofitable condition. A comparatively small sum of money would put them on a paying basis. With the ground fairly opened for the extraction of ore and with facilities for transportation and reduction, the bullion would roll out with astonishing rapidity.

Outside of this particular belt which cuts the mountain in twain, there are many locations upon which more or less work has been done—enough, however, to prove that the gold is not all on the surface; that it goes down, and that the ledges become stronger, and also develop the characteristics peculiar to the May Lundy group of mines and those in that vicinity.

There are unequaled inducements for capital here, such as few mining districts can offer. As we have frequently said, there has been enough bullion extracted to develop bonanzas in a dozen or more places, but the short-sighted men into whose hands it falls do not care to spend money for the development of their properties, not having sufficient knowledge about systematic mining to realize that a mine, like a cow that is ever so good, may be "milked dry." When they find that dividends have shortened to a complete stoppage, they may possibly get the idea through their heads that the best mine in the world will not stand incessant gouging—that some "dead work" must be done, and new ground opened and explored, if they want their mines to yield more bullion. If they knew anything about their own business, they would be doing this now, under the direction of a competent miner. It would put lots of money in their pockets.

THE EARLIEST ELEVATOR.—Probably, according to the London *Globe*, a reference to the use of "lift" has been found in the Greville Memoirs, under date March, 1830. Greville describes one as being used in the Royal Palace at Genoa—"a machine made like a car, which is drawn up by a chain from the bottom to the top of the house." There is some curiosity as to whether there are any early references to a convenience which in England has only been supplied to any notable extent during the last few years.

THE NEW WHITE LEAD PROCESS.—The new Hannay method of manufacturing white lead from the ore in the space of a few hours is soon to bring about a surprising revolution in the business, as by the old process it takes several months to bring about results.

Influence of the Forests on Climate and Rainfall.

[Translated for the PRESS from the works of AUGUST GRISEBACH, with comments, by PROF. GRANVILLE F. FOSTER.]

The question of the effect which forests exercise on climate, and whether an increase in land cultivated, when it implies the clearing away of the wood and the letting in of the sunshine upon the soil formerly shaded by dense thickets of trees, does actually cause any essential change in the physical conditions of organic nature, is a very important one, and one frequently asked, and in a variety of senses as often answered. That the forests do exercise an influence in preserving the ground uniformly wet during the course of the seasons is universally acknowledged. The slightest observation is needed to establish this fact, since the hight of water in rivers flowing from forest regions changes less than in those which flow through open, unshaded landscapes. The humus of the soil about the trees, interwoven with roots and rootlets, retains a part of the rainfall which otherwise would have long before run off into the brooks or rivers. Also, the rainfall itself is more copious in such a region, since each leaf is an evaporating pane, and hence the mass of leaves of a forest forms an unexampled extent of surface, furnished with water, the constant evaporation of which causes a coldness which communicates itself to the surrounding stratum of atmosphere from which thus the dampness can again be condensed to fogs and clouds.

(This will be true if the atmosphere near the trees is near the dew-point; that is, already nearly saturated with moisture, but this cannot occur often in California, since at the season of leaf, the interior plain, shut off from the sea, except at a few points, becomes so hot that the relative humidity of the air is very low, the capacity of the air for moisture becoming greater and greater with the increasing temperature. Thus air at 100° Fahr. can hold in an invisible state five times more moisture than air at 50°, and hence, air which at the second named temperature would be exceedingly damp, would become excessively dry at 100°, and yet have the same amount of water in it. The fact, however, that moisture is retained at the roots of trees by both the condition of the soil and the shading by the leaves, is just as true of this State as for any region on the globe, and the necessity for preserving the forests of the Sierra Nevada mountains, the source of the streams which spread fertility everywhere in the valley, and from which the people of the State hope to get the water to carry out their schemes of universal irrigation in the future, is becoming more and more imperative. The last three years have been comparatively dry ones, and the snows of the mountains, unsheltered by trees, melted away early in each season, making the latter part of the dry season dry in fact, below as well as above, causing serious inconvenience everywhere. It is a shame for the State to allow unprincipled men to kill the goose which lays the golden egg.—Translator.)

The summer sky often becomes a topographical mirror of the landscape beneath. Over the forests the clouds are formed, but the sky is deep azure above the open and strongly heated plains out of which ascends a steady stream of hot air into which patches of the surrounding clouds are seen to enter only to vanish away. Were the cloud-masses not in constant motion, it would rain still more frequently in the forest, since the whole precipitation would be there, but the motion of the clouds and the succession of wooded and woodless tracts of country supply the favorable condition for supplying the latter with showers, since when the clouds are unusually heavy and the temperature somewhat lower than usual, the clouds will press over the whole of a given region, wooded or not, and a precipitation will take place even when the general direction of the wind betokens clear weather.

(The truth of this statement is often observable in the summer season in the wooded portions of the Sierra Nevada mountains, in which there will sometimes be heavy showers which will extend somewhat beyond the line of the forest, while the dry season is yet at its hight. It often rains on a few of the largest, densely wooded oases of the Great Sahara desert of Africa, although on all sides lie almost interminable stretches of sand and rock upon which rain never falls. Deserts perpetuate themselves. Is it well that California should be reduced to a desert by man's stupidity?—Translator.)

Three physical circumstances in combination can be alleged for the lower temperature which obtains in forest regions than elsewhere, and which, during the period of vegetation, fully accounts for the frequent precipitation of moisture. First, the vast mass of leaves which prevents the sun's rays from reaching and hence from warming those unorganized portions of the earth's surface beneath, capable of receiving a high degree of sensible heat, so that the stores of water laid up partly in the web of mingled humus and rootlets directly beneath the trunk, to which a large share of the total weight of the fullness of the vegetation of the tree is directly owing, and partly in the surface stratum of the earth in general, are in the main preserved, and finally the evaporation of water from the leaves which constantly exerts its cooling effect on the circumambient air. All of these account for the coolness of atmosphere which prevails in forest regions. The effects of these show themselves in the measurement of the temperature of the web of rootlets, and in comparing the temperature of the shaded earth with that of the landscape which stands in full open sunshine. In winter, opposite conditions obtain, so far as temperature is concerned, but what worked in summer for the acceleration of a water circulation through the atmosphere of the forest is of positive worth in increasing all the rainfalls of the year. In the high mountains the diminishing of the rainfall may not always be observed, even if the forests be cut down, since the effect of the trees may be less than that of the coldness of the ground, resulting from the great altitude; but in the highlands of the tropics, in India, and in Brazil, and in the lowlands everywhere, has the destruction of the forests been followed by a corresponding lessening of the rainfall.

(The climate of California being semi-tropical, the lower slopes of the Sierra Nevada, say to the altitude of 3000 feet, would come under the same rule as the slopes of the Himalaya to a hight of about 10,000 feet—that is to say, the removal of the forests would diminish the rainfall. But the removal of the forests from the slopes of the Sierras at a *greater* altitude than 3000 feet would also *work injury*, for though it might not diminish the aggregate fall of water, which here in winter usually assumes the form of snow, yet the very absence of the trees would allow the sun's heat in spring to melt the snow away rapidly, swelling the rivers for the time, only to leave their dry beds later on in the season, while the protection of the trees would preserve the snow so that it would gradually melt; and it would hardly be quite melted away before the next year's precipitation would commence.

The effect of cutting away ruthlessly the timber of mountain-sides may be seen in all its deplorable result in the land that once "flowed with milk and honey," most of which has been reduced to a treeless desert which will remain so till proper irrigation has been resorted to, trees again planted and forests thus formed to start again in all their beneficent results the former and the latter rains. We have in the industry of the Mormons a result which ought to be a good lesson to Californians. A desert has been made to blossom like the rose. The numerous artificial forests about Salt Lake City have caused considerable precipitation each year, which is on the increase—a fact shown from the increasing depth of Great Salt lake, which has already raised some 12 feet since Brigham Young led his faithful hosts to a barren waste, which cultivation afterward turned into a veritable Eden or Second Palestine.—Translator.)

The Fortune of Gold Digging.

As an illustration of the fortune of gold-digging, we publish the following from the *Australian Mining Standard;*

"The history of one of the Ballarat claims, called the Blacksmith's claim, because the owner belonged to that craft, reads like a page of romance. The blacksmith with a party of eight, all novices, sunk the shaft in so irregular and unworkmanlike a manner that it was absolutely at the risk of his own life that a man made the descent to the bottom. Without opening out a regular drive, they washed all the stuff within reach, and, after realizing £12,800, offered it for sale; but so wet and rotten was the ground, so badly sunk the shaft, that at first no purchaser could be found. At last a party of ten plucked up courage and bought all right and title to the claims and tools for £77. They entered into possession at noon on Saturday, and long before the sun had set had in their possession £2000 worth of gold. By working day and night until the following Monday they raised this to £10,000. Then, after the usual reckless manner of lucky diggers, they left this mine of wealth and went on the spree for a week. Their tenants made good use of this time at their disposal; they opened up two drives, and before the week was out were the happy possessors of £14,000—all taken out of the claim. The other party returned, and after a week's work, during which they realized £9000, sold out to a storekeeper for £100, who put in a gang to work in shares, and these, laboring in desultory fashion for a fortnight, took out £5000. At the end of that time one of the party, an old hand from Van Dieman's Land, undermined the props and next morning on returning to work the men found the whole of the workings had fallen in. The rest of the party appeared to have taken this misfortune very calmly, and to have completely abandoned the claim, for no mention is made of further proceedings. But it is related how the author of the mischief cooly marked out a claim of 24 feet square on the top of the ruin, and working with a hired party sunk a shaft straight as a die for the gutter. The tubful of washed dust they raised turned out 40lbs. of gold, and the next two averaged 10lbs. each; and, as Ballarat gold was, and is, superior to any other at all times, fetching at least £4 an ounce, these three bucketfuls of earth were worth £2880 to their fortunate possessor. Altogether out of that small area, hardly larger than a good-sized room, was taken in a few weeks gold worth nearly £60,000.

A Site for Manufacturing.

The Grass Valley *Miner* says: The approaching completion of the great granite dam over the American river, near Folsom, is beginning to engage much attention, as the ample water-power that will be obtained for the use of such manufacturing as will be conducted at the State prison, and by private corporations and individuals, gives an assurance that at no distant day Folsom will become a place of real manufacturing importance. Its location, supplemented by this water-power resource, warrants this assumption, for the power will be so much cheaper than the use of steam that manufacturing establishments will naturally gravitate to that point. The value of the power that could be furnished by the American river at Folsom has long been realized by observing men, but the time had never been ripe for carrying out the project of building the necessary works, and has now only reached the point of fruition through the assistance given by the State by the furnishing of convict labor, which has greatly cheapened the cost of the enterprise. The success of this great project admits of no doubt in the minds of practical men, who see in it the beginning of other enterprises of a similar character along the foothill range of the Sierras, where the mountain rivers make their entrance into the valley.

The next point that is worthy of particular attention is at the narrows of the Yuba, in the close vicinity of Smartsville, where a dam of the same character as the one at Folsom could be constructed at a much less cost. This location has long been regarded as a very favorable one for the construction of a debris-impounding dam, but without considering a dam for that use the facilities offered for a dam to secure water-power for manufacturing purposes are equally as good as at Folsom, and cannot long be overlooked by far-seeing and enterprising men. Smartsville would have the same advantage as a manufacturing center as Folsom if it had railroad communication, and this would certainly come if a dam were built and the canal constructed that would convey the water to the various establishments that would naturally grow up there. The Yuba basin is equally as large as that of the American river, having the drainage of a vast territory between Bear river and the Feather river basin, and extending from the valley to the highest ranges of the Sierras. Smartsville has a like advantage with Folsom in being centrally located at the edge of the valley, being about 700 feet above sea level, and possessing a salubrious climate, being below the snow belt, and an adjacent country susceptible of high cultivation on account of the quality of its soil, which will yield a great variety of products.

Smartsville, by natural situation, should become one of the important manufacturing points in the State, as it shares with Folsom the facilities for that purpose.

Horseback Prospecting.

Throughout all the mining regions, says the Bedrock *Democrat*, there has been done a great deal of horseback prospecting. Most of this was done by the old-timers. Ask one of these to day about the mineral characteristics of a particular section of hill or mountain country, and he will sententiously pronounce it "no good." If his reason for thinking the range in question "no good" be demanded, he will probably tell you that he and half a dozen "old pards" traveled all over the country years ago and "saw nothing worth stopping for."

Take half a dozen men, mount them and start them through the country, and it is not easy to get them to stop for anything. When an unusually large and fine-looking quartz vein is found they may dismount and look at it, but that number of men can never be brought to agree to stop and work anything. One or two may think the party should halt and sink upon a vein that presents a promising appearance, but the others will at once begin to make all manner of objections. There is no timber near it, it is too far from water, or the country rock is not of the right kind. Such a party generally has some particular mountain range or section of country for its objective point, and in going toward it there is no turning aside from the most direct and easiest road. Not a man will dismount and go up into rocky hills where a horse cannot be taken. Such a range of hills may be skirted, and some member of the party may point to spots to indicate the presence of mineral veins, but the others begin at once to point out features of a damaging character, and when all the arguments pro and con have been heard, the verdict of the mounted jury is, "no good."

In all the Pacific Coast States and Territories there are mountain regions embracing hundreds of square miles that have been "prospected" in just this way. How many expeditions we remember that they have started out well mounted and equipped with a sufficient number of pack animals to carry an ample supply of provisions through all long stretches of wilderness. One in particular from the Pacific Coast passed through the southeastern part of Oregon, thence into Idaho and down through Nevada into Colorada and Arizona, where they turned and journeyed back to the "place of beginning," as the surveyors say. In all this trip they never dug a hole five feet deep in either quartz vein or placer ground. They

could never agree upon any vein or spot of ground. They were after an immensely "big thing," and the big thing was always ahead. In Idaho, Nevada and Arizona they discovered a number of mineral belts and lodes that were afterward found to be rich—which yielded millions on millions in gold and silver and built up large towns and camps—yet when they got back to Tehama they reported that they had found nothing; the country over which they had passed was "no good."

THE NEW GERMAN METAL, known as germanium, is described as having a great resemblance to antimony, though distinguished by certain well marked reactions. It is found that if the sulphide is heated in the absence of air, that is, in a current of hydrogen, it forms a blackish crystalline sublimate, which, at a higher temperature, melts to brownish-red drops; this sulphide dissolves in ammonium hydrosulphide, and is again precipitated with a white color by hydrochloric acid, and is again redissolved by ammonia. If arsenic or antimony is present, the color is yellow; if heated in air, or treated with hot nitric acid, white germanium oxide is formed, which is not volatile at a red heat. The oxide dissolves in potassium hydroxide. If this solution is slightly acidified, it gives a white precipitate on treatment of hydrogen sulphide. The oxide is easily reduced by hydrogen, the sulphide less easily. The metal is gray, volatile at a full red heat, though less readily than antimony; the vapor deposits small crystals resembling those of iodine, which do not melt; in a current of chlorine the metal yields a white chloride, which is more volatile than antimony chloride. Such are some of the characteristics of this curious new metal.

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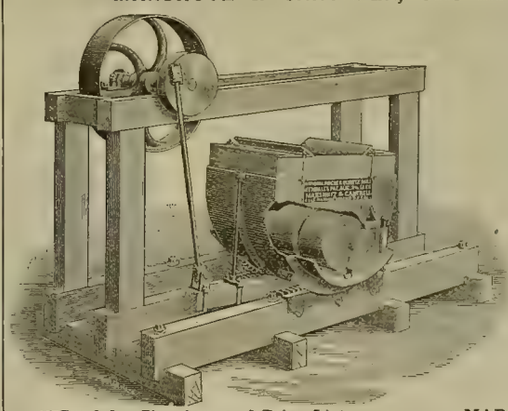
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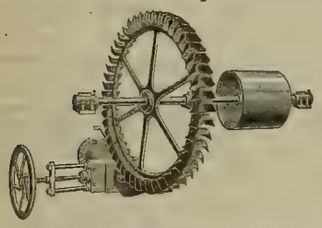
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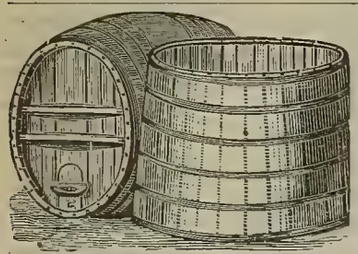
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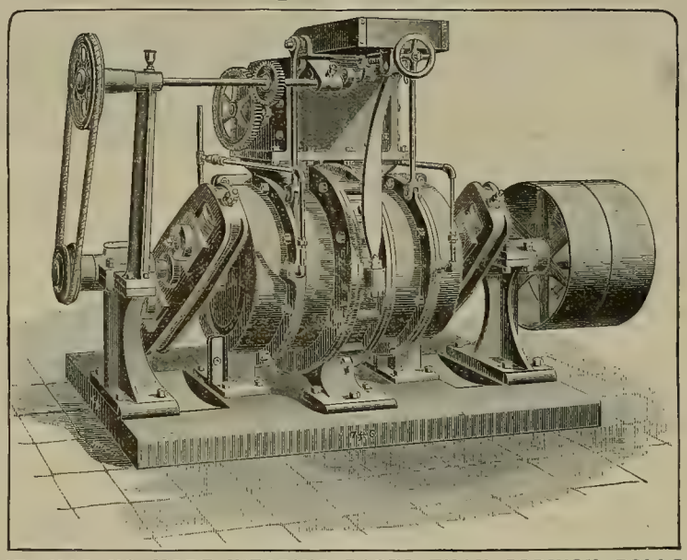




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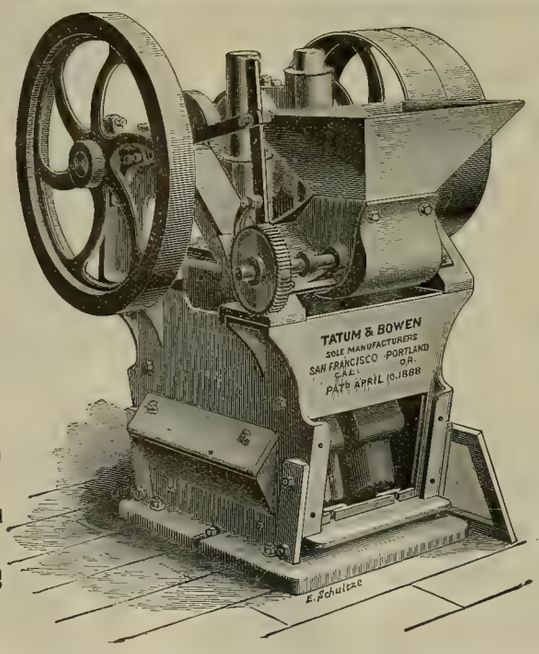
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The Tanning Business.

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The Business Not Injurious to Health.

There are many in this city and other cities and large towns in the State who object to the presence of tanneries in their neighborhood on the plea that they are unhealthy. In regard to that matter the *Hide, Wool, and Leather Trade Review* of this city of a late date says: "Any man who argues that a tannery or anything connected with the business carried on in a well-conducted tannery is injurious to health, lays himself open to flat contradiction by all students of hygiene and compilers of vital statistics. The tables of life-insurance companies show that in the opinion of actuaries who have made a life study of the effect of the various occupations on longevity, the tannery business is not injurious to the health of those that follow it, and therefore cannot be to the inhabitants of the vicinity who are still further removed from its atmosphere. Obnoxious to the acute sense of some people, possibly, nay probably, tanneries are, however, well conducted. But there are a great many things obnoxious to some people which, nevertheless as members of the community, and for the benefit of the community at large, they must put up with. The ringing of church bells, the firing of salutes, the rumbling of the cables of the street railroads, the continual jingle of the bells of these cars, the cries of hawkers, the piano next door or the midnight ball over the way, are all nuisances to some people. Many consider a church close by a nuisance, and a public school a worse nuisance; a livery stable is a nuisance, a blacksmith shop, a steam engine, a foundry, a flour-mill, or a boilermaker's shop, these are all nuisances. A butcher's shop is not a pleasant neighbor because it attracts flies, and a down-town store where Limburger cheese is dealt in is worse. Yet all these nuisances are permitted and openly allowed, because it is for the interest of the many that they should be allowed even though a few may suffer." These opinions are fully sustained by our city Board of Health.

Tanning by Electricity.

A French firm (MM. Worms & Bale) have succeeded, after long endeavors, in applying electricity to the art of tanning in such a way as is claimed to accelerate the process. We are now able, says the *Electrician*, to give some further information as to the method adopted, and although our knowledge of the art does not enable us to offer any opinion as to the precise value of the invention, yet we are very hopeful that it will ultimately afford an important outlet for electrical apparatus. What is actually done is very simple. The rawhides are placed in large cylinders which revolve upon horizontal axles. Provision is made for passing a current through the drum, the electrolyte being a decoction of tannin. (Further electrical details are at present wanting.) The drum is kept slowly revolving until the process is complete. The time required varies with the nature of the hide. Light calfskins, sheep and goat skins, which used to require from four to six months, are said to be completely tanned in 24 hours. Horse and ox hides require from 72 to 96 hours, while by the old-fashioned bark process they would have taken 12 months or even more. As to the quality of the leather, several French leather merchants have stated that it is above the average strength and has all the solidity and suppleness of the best samples. Specimens of harness, etc., made from this leather are shown at the Paris Exhibition. Furthermore, in addition to the economic value of the immense saving of time, it is stated that the working cost per pound of dry leather will be only 3½ to 4 cents, as against 7 to 8 cents per pound, which is the figure now reckoned by the Bermondsey tanners. The number of hands required is said to be only about one-fifth, and the capital expenditure is largely reduced. It is evident that if only half this be true, there is, to say the least, "something in it."

As to the scientific aspect of the question, the exact nature of the role played by the electric current is not at all clear. Prof. S. P. Thompson, who has examined the process, suggests that the effect may be in some way to open the pores of the hides and so permit a more rapid access of the tanning solution, and also that its chemical activity may be increased by the electrolytic action. Mr. A. Zwierzchowski thinks that the current renders the gelatine more soluble, so that it is able to combine more rapidly with the tannin.

M. E. Leonardi, in a recent number of the *Revue Internationale de l'Electricite*, mentions several schemes of this nature, all of them failures, the earlier ones necessarily so, from the lack of an economical means of producing current, while others suffered equally from a lack of electrical knowledge on the part of the "inventors."

The *Shoe and Leather Review* reports the formation of a company with a capital of $800,000 in Chicago and New York for tanning by electricity, under a process said to be in successful operation in Sweden. It is claimed by the promoters of this enterprise that by the electric method leather can be made in four days, while the time usually consumed in this operation now averages five months.

A New Leather Preservative.

In this connection we would call attention to an alleged discovery which is said to have been made by some one connected with the State University at Berkeley. It seems that some three years ago some experiments in the chemical department at the University showed that certain combinations of fats and oils with certain sulphur compounds had the effect of rendering leather water-proof, very pliable and much more durable than under ordinary circumstances. Very little was said about it, but the severest tests were applied to the leather thus prepared in various ways when made up into boots, shoes, etc., and in every instance the new products showed most remarkable results. The leather wore from two to three times as long as the usual material. Some of our cotemporaries, both in this and in the Eastern States, seem to be much interested in the discovery. The leather manufacturers are becoming decidedly alarmed with the idea that if by the new process leather can be made to endure two or three times the wear of that prepared in the usual way, it will lead to a surplus of the article and a consequent reduction in the price. Large arrays of figures have been brought out. It is said that there are consumed in the United States alone $300,000,000 worth of boots and shoes a year. Now, if that value is ever doubled in its wear, it means a saving of nearly $150,000,000 a year and a consequent proportionate reduction in the call for the leather product. The result would be a revolution in the leather business disastrous to the capital now invested therein, but of incalculable value to the people who consume the product. Our entire population, from the youngest toddler to the oldest adult, are interested in the outcome, which will be looked for with much interest. If the expectations are realized, our University will have well repaid the people for their outlay in its establishment and become a matter of proud congratulation for all Californians.

Styles in Shoes.

In the battle of boots and shoes, the French seem to be losing their grip. The heels are coming down and the soles are spreading out. An observer in any city outside of Paris on a windy day will notice among the fashionable promenaders two common-sense shoes to one French heel, while a medium style, or a compromise between the two extremes, adorns the feet of the great majority. The *N. Y. Shoe and Leather Facts*, in alluding to this matter, says: On Fifth avenue and from Thirty-third street to Fiftieth, where the daughters of wealth and luxury most appear, the extreme type of common-sense shoe "takes the sidewalk" by a large majority.

It was about the middle of the last century that high heels began to be worn. Makers of heels were then introduced into the shoemaker's trade. Even now there are 400 heel-makers in Paris. Elastic-side boots began to come into use about 1842. The elastics were made in England. Boots and shoes were sewn up to the year 1800, then nails were introduced. In the ninth and tenth centuries the common form of shoe in Europe was the wooden shoe.

American Kid is Leading the World.

The Philadelphia correspondent of the *Shoe and Leather Review* says that there are now in that city two French kid leather manufacturers to learn the secret of the manufacture of American kid. French kid a a few years ago led the world, but now the French admit that when the kid is made up into a shoe the American kid looks as well as the French and wears better. The sequel of this is that the Frenchmen are here to learn how the Americans manufacture the article. This fact must be a consolation to our manufacturers who have persevered, amid discouragements, to perfect their beautiful products. So good a judge as H. D. Richardson of London thinks there ought to be a market for American kid in England, and who knows but it may be shipped to France? In view of this possible opening, it is a pity that our kid and kid-shoe manufacturers are not more fully represented at the Paris Exposition.

The Change from Boots to Shoes.

Considerable attention, says the *Boston Advertiser*, has of late been called to the calf-skin situation. Of late years the demand has been falling off, as other kinds of leather have been taking its place. One of the principal causes of this lies in the fact that long-legged boots have been going out of favor, shoes taking their place to a great extent. This has had great effect on the consumption of leather; upon an average it requires about two and a half to three times as much stock in the manufacture of boots as is required in the making of shoes. In this way the use of calf-skins has greatly declined. During the past few years the styles have run more toward "Dongola" and kangaroo leather for fine shoes, and this has been a serious setback for fine light-weight calf-skins.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

From the official report of U. S. Patents in DEWEY & Co.'s Patent Office Library, 220 Market St., S. F.

FOR WEEK ENDING SEPT. 3, 1889.

410,307.—HARVESTER—Dan'l Best, San Leandro, Cal.

410,149.—RAILWAY RAIL JOINT—Chadbourne & Stuckey, Rosamond, Cal.

410,315.—GANG-EDGER—F. W. Cook, S. F.

410,349.—SAWMILL SET WORKS—F. W. Cook, S. F.

410,166.—MINERS' CANDLESTICK—D. B. James, S. F.

410,245.—BURNING BRICK—J. M. Jameson, Los Angeles, Cal.

410,252.—CUSPIDOR — P. I. Peirce, Oakland, Cal.

410,292.—CONCRETE-MIXER—E. L. Ransome, S. F.

410,334.—ROCK DRILL—E. A. Rix, S. F.

410,383.—PATTERNS AND MODELS—E. Stahl, Prescott, A. T.

410,301.—MERRY-GO-ROUND — W. C. Tyler, S. F.

The following brief list by telegraph, for Sept. 11th will appear more complete on receipt of mail advices:

California.—Eugene S Bonelli, S. F., exercising device for musicians; Joseph Brown, Santa Rosa, latch; Henry R. Coffey, Stockton, fare register; Wm P. Humphreys, S. F., assignor to C. Dodge, West Washington, D. C., dredging machine; Andrew W. Livingston and G. Wilcox, S. F., soldering machine; Edward Moyle, Grass Valley, drill chuck; Orestes Pierce, S. F., filter; Isaac F. Thompson, S. F., cut-off valve gear for engines; Hezekiah O. Triplett, Orland, grain separator.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

GANG EDGER.—F. W. Cook, S. F., assignor of one-half to H. B. Gregory & Co. No. 410,315. Dated Sept. 3, 1889. This is an improvement in that class of wood-working machinery known as gang edgers. The patent covers certain constructions and combinations of devices.

SAW-MILL SET WORKS.—F. W. Cook, S. F. No. 410,349. Dated Sept. 3, 1889. This invention relates specially to the lever mechanism by which the set works are operated, and consists in certain novel mechanism for obtaining accurate fractional movements of the works. The object of the invention is to provide a simple and effective means for readily and accurately limiting and defining the movement of the set lever.

COMBINED HARVESTER AND THRASHER.—Daniel Best, San Leandro. No. 410,307. Dated Sept. 3, 1889. The invention relates to that class of harvesting implements known as combined harvesters and thrashers, and to the connection therewith of a traction engine, whereby the apparatus is drawn about the field, and a secondary engine by which the entire mechanism of the harvester and thrasher is driven independently. The patent covers certain details of construction and combinations of devices.

CONCRETE MIXING MACHINE. — Ernest L. Ransome, S. F. No. 410,292. Dated Sept 3, 1889. This is an improvement in that class of machines in which a rotating case is employed to receive and mix the material to form concrete, and is especially applicable to a machine patented by the same inventor July 14, 1885, in which a series of lifting shelves or flanges are fitted within the rotary casing of the mixer. The invention consists of an automatically operating device by which the shelves or flanges may be turned upon their pivot or fulcrum-pins, so as to either lie flat or stand, so as to discharge the material when properly mixed.

MERRY-GO ROUND.—Walker C. Tyler, S. F. No. 410,301. Dated Sept. 3, 1889. This invention relates to that class of holiday amusement devices commonly known as "merry-go-rounds," in which a rotating frame carries a series of seats in the form of carriages, boats, horses, etc. The operation of the device is such that a rocking motion is imparted to the horses, boats, etc., as they go about the circle.

ROCK DRILL.—Edward A. Rix, S. F. No. 410,334. Dated Sept. 3, 1889. This covers certain improvements in rock drills of that class in which the drill is connected with a piston moving in a cylinder under air pressure, and in which a valve mechanism is so arranged that the reciprocation of the piston and drill will be produced automatically. In the ordinary construction of the guides for the cylinders they have been made comparatively light and have been fixed in a horizontal plane above that in which the piston reciprocates, and as a consequence the rapid reciprocation and the jar of the piston in a different plane tended to destroy the accuracy and durability of the parts. By the construction devised by Mr. Rix the guides are so arranged that the line of travel of the drill and piston are brought into the same horizontal plane with the guides and directly between them, so that no undue strain takes place from the rapid motion or shocks of the drill. The guides are also given a larger surface, which causes them to run more smoothly and wear longer. Other improved details of construction are also covered by this patent.

Mining Personals.

F. M. Murphy is superintendent of the Congress mine, Arizona.

T. J. Quimby is superintendent of the Rawhide mine, Tuolumne county.

Geo. N. Conard is superintendent of the Little Boy mine, Todd basin, A. T.

A. P. Minear of the Amador G. M. Co. Limited, has left for the East on business connected with the mine.

S. L. Jones, superintendent of some of the Gold Hill mines, Virginia City, is visiting this city on official business.

O. H. Powers, formerly superintendent of the Cherokee mine, is in charge of the Lower Trinity Tunnel river-bed mine, Trinity Co.

F. S. Grant, a prominent mining man of Tuscon, A. T., was in the city this week; also, W. S. Davis, a mining engineer from Auburn.

John W. Mackay is expected to arrive at Virginia City the last of this week to personally inspect the mines in which he is largely interested.

Joseph Sparks, well known among the mining men of the Comstock for the last 20 years, has returned from a two-months' visit to the old country.

H. M. Levy, president of the Savage and Hale and Norcross mining companies, and Herman Zadig, returned to this city this week from a visit to the mines.

S. N. Knight of Sutter Creek has had photographs taken of his hydraulic engine recently described in the PRESS, and will send these to the State Fair, instead of the engine, which is too heavy to be sent down.

Prof. Wm. P. Blake, who is at Prescott, Arizona, says there is a deposit of kaolinite which should be utilized on Milk creek, one of the tributaries of the Hassayampa, entering just above the Walnut Grove storage reservoir.

Roger Pendergast, assistant superintendent of the Chollar, Potosi, and other Comstock mines, has been granted leave of absence, and will soon go to the Eastern States to visit his old home, which he has not seen for 33 years.

James L. Patterson, superintendent of the mine of J. S. Doe of San Francisco, was stopped between Daggett and Calico, and robbed of $5000 in gold coin. The money was taken by him from the express office the same morning to pay off the miners.

L. W. Pittman has been elected recorder of Cinnabar mining district, which includes territory in both Sonoma and Lake counties, in this State. Men have recently resumed work in this district, which has been idle for some years. In 1873 and 1874 several hundred men were at work in the quicksilver claims there.

C. C. Fitzgerald of the International smelter at El Paso, has bought the Turquoise mine, a lead property, at Tombstone, paying $30,000 therefor. This is the second lead property this smelter has bought since the agitation of the Mexican lead-ore question commenced, and it shows that an American can get lead in the United States for his smelter if he wants to.

Reward for Mail Robbers.

WASHINGTON, August 30.—The following order has been issued by the Postmaster-General:

In consequence of frequent armed attacks made by highway robbers upon the United States mails in the Western States and Territories for some time past, the Postoffice Department, for the year ending June 30, 1890, will pay the sum of $1000 as a reward for the arrest and conviction in the United States Courts of any person found guilty of making an armed attack upon any stage, coach or railway mail car having mails in transit. This reward will be paid to the person or persons causing such arrest and conviction, upon presentation of satisfactory proof thereof to this department. Order No. 139, of date July 16, 1889, offering $200 reward in like cases, is hereby rescinded.

NEW FERRY-BOAT.—The San Francisco & North Pacific Railroad Co. has filed for record two contracts for the construction of a ferry-boat, which is to be used in conjunction with those now plying the bay. One of the contracts is with John W. and James Dickie of the firm of Dickie Bros., to construct the hull of a double-end ferry-boat, in accordance with plans and specifications, for $45,250 The other is signed by Hinckley, Spiers & Hayes, who agree to construct the engine and boilers in accordance with the specifications for $79,000.

AT a meeting of the California University Regents this week, bids were received for the erection of a new building for a chemical laboratory at the University, and that of R. Mitchell, for $56,445, being the lowest bid which had complied with the regulations, was accepted.

THE steam fitters from various parts of the United States are in session in Chicago for the purpose of forming a protective combination, to be known as "The Master Steam and Hot-Water Fitters' Association."

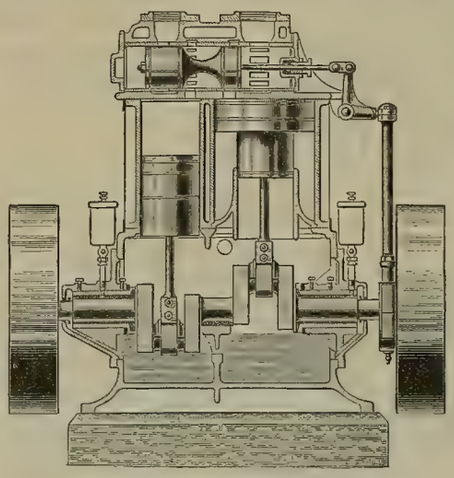
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SALES DURING LAST FOUR MONTHS:

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Dry Process
GOLD SEPARATOR.

They are good machines. If the gold is in the dirt they will save it. They will save finer gold than water will.
T. J. SCOTT,
Osceola, Nevada.

Smith & Drew took out Tuesday, in their dry wash diggings, in addition to 5 ozs. of fine gold, a nugget weighing 22 ozs. The machine used was Freeman's Dry Process Separator.—*Utah Daily Union, May 10, 1889.*



Send for descriptive Circular and Price List.

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Stamp Mills for Wet or Dry Crushing. Huntington Centrifugal Quartz Mill. Drying Cylinders. Amalgamating Pans, Settlers, Agitators and Concentrators. Retorts, Bullion and Ingot Moulds, Conveyors, Elevators, Bruckners and Howell's Improved White's Roasting Furnaces, Etc.

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IMPROVED CORLISS AND SLIDE VALVE STEAM ENGINES. ❋ BOILERS HORIZONTAL, VERTICAL AND SECTIONAL.

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Hoisting Engines, Safety Cages, Safety Hooks,

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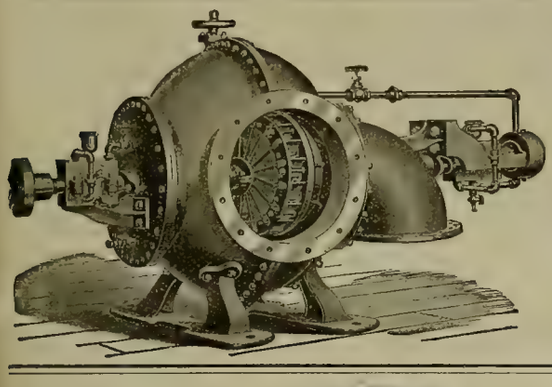
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These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

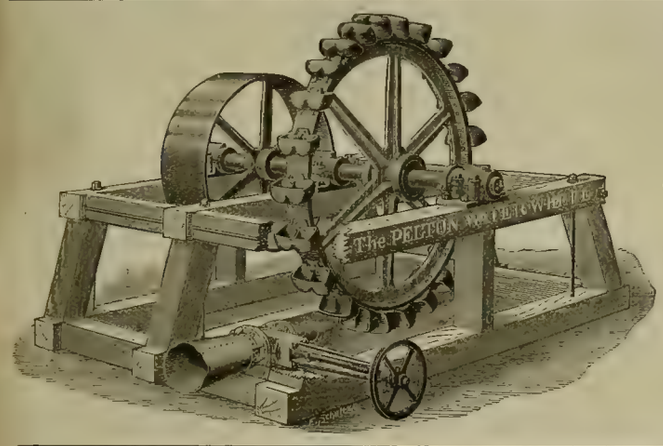
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Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

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(A Corporation.)

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JOHN TAYLOR & CO.,

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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price. Our New Illustrated Catalogue, with prices, will be sent on application.

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Nevada Metallurgical Works.

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Ores worked by any Process.
Ores Sampled.
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Ores Sampled and Assayed, and Tests made by my Process.
Assaying and Analysis of Ores, Minerals and Waters.
Mines Examined and Reported on.
Practical Instruction given in Treating Ores by improved processes.

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GREAT REDUCTION!

BATTERY SCREENS.

Best and Cheapest in America.

No imitation, no deception, no planished or rotten iron used. Only genuine Russia iron in Quartz Screens. Planished iron screens at nearly half my former rates.

I have a large supply of Battery Screens on hand suitable for the Huntington and all Stamp Mills, which I will sell at 20 per cent discount.



PERFORATED SHEET METAL

For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass. Zinc and other metals punched for all uses.

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Sept. 12, 1889.

In some branches of trade business is only fair, while in others it is fairly active. It is claimed that while trade is generally dull, the outlook is favorable for a large business this fall. The low price of grain is against a decided revival of trade in some sections, but the good prices for fruit, raw and dried, help in other localities. Farmers are generally storing their grain and obtaining accommodations. Large sums of money are being drawn from this city. One bank alone has sent out on an average about $50,000 in coin each day for the past three weeks. Two or three of the other banks are also sending out large sums of money. This money will soon begin to find its way back to this city. Outside of the call for coin, with which to move the grain crops, the demand for money is light, particularly with no speculative movements in anything.

MEXICAN DOLLARS—The market has ruled steady throughout the week at 74¾@74¾c. The steamer hence Sept. 11th for China took out for Hongkong $333,636; for Japan, $66,000. Total, $399,636.

Since writing the above, we are advised of a sale of Mexican dollars from first hands at 74¾c.

SILVER—The market continues to rule from one-fourth to three-fourths cts. an ounce above New York quotations, prices here being governed by the urgent requirements of buyers. For shipment by last steamer leaving for China, as high as 93 6-10c was paid; after the steamer sailed, buyers drew out and are only tempted by lower prices. We are unable to give correct quotations at this writing, and in its absence the quotations are nominally at buyers' bid, viz: 93⅛@93¼c an ounce. The obtainable supply on this coast is still light. The steamer that left yesterday for China took out the following bullion: For Hongkong, $119,000; for Japan, $149,300. Total, $268,300.

London cables came through to-day (Thursday) at 42 9-16d, with the market very strong. New York came through at 93c.

QUICKSILVER—Receipts the past week aggregated 309 flasks. The market is still quiet, with prices inclined to favor buyers.

LIME—Receipts the past week aggregate 5432 bbls., and exports by sea 750 bbls., to Honolulu. The market has a steadier tone, with the consumption showing an increase.

BORAX—Receipts the past week aggregate 182 ctls. The demand from the East is reported to be quite active, which causes a strong market.

COPPER—The market is unsettled, with lower prices ruling at the East. At this writing it is difficult to obtain reliable information as to the cause or causes that have brought it about, and in its absence it is only natural to ascribe it to the threats made some time ago that if the European holders and mine-owners did not come to American mine-owners' terms a strong fight and low prices would follow.

TIN—The exports by sea the past week aggregate 29,150 pounds plate and 3890 pounds pig to Victoria. The market has a steadier tone for spot and a strong tone for shipments. The demand with us is quiet.

COAL—Imports the past week aggregate as follows: From Nanaimo, 5506 tons; Port Blakely, 550; Seattle, 4310; Departure Bay, 6775; Australia, 2515; total, 19,646 tons. The market is very strong for both spot and shipment, yet there is an understone of uncertainty regarding the future owing to the large tonnage with coal on the way and loading in Australia for this port. The latest mail advices gave it at about 75,000 tons register, equal to about 120,000 tons of coal. Besides this is a registered tonnage of 12,000 tons for neighboring ports. The coast colleries are increasing their output, but then coast freight is higher. The home demand is good, as it always is when parties begin to lay in their winter supply.

IRON—Imports the past week consist of 200 tons of pig from Irondale. The local market is reported very strong at full figures. To fill a large order probably an advance would have to be paid. The high cost of iron abroad and higher charters make it nearly impossible to execute orders for forward shipment. The consumption with us is increasing.

The following are the latest comparative quotations f. o. b. at Glasgow:

	Aug. 28, '89.	Sept. 4, '89.
F. o. b. Glasgow.		
No. 1 Coltness	61s	64s
" Langloan	59s 6d	59s 6d
" Summerlee	59s 9d	60s
" Gartsherrie	58s 6d	60s 3d
At Ardrossa.		
No. 1 Eglinton	47s 6d	48s 6d
" Glengarnock	56s	56s 6d
" Dalmellington	49s	50s 6d

Eastern Metal Markets.

By Telegraph.

NEW YORK, Sept. 11, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	42⅜	92½	$11 90	$3 95	$20 70
Friday	42⅜	92⅜	11 80	3 97½	21 25
Saturday	42⅜	92⅜	11 75	4 07½	21 50
Monday	42 7-16	92⅜	10 80	4 10	.....
Tuesday	42½	92⅜	10 75	4 05	21 75
Wednesday	42 9-16	93	10 75	4 00	21 50

NEW YORK, Sept. 9.—It is currently reported Lake copper sold at 11c; October and November, by responsible holders, electro grades, 10¾@11c; common casting, 9¾@10c. Pig lead advanced to $4 05@4.10, with strong consumptive demand, but at the close fell off again. The situation is also helped by the reduction of importation of lead in Mexican silver ores under the present Treasury Department regulations. Quicksilver steady; 69@70c. Borax strong, 9½c, refined.

IT is reported from Wales that extensive veins of gold quartz have been struck at Voel Vaman, Flintshire.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, September 12, 1889.

ANTIMONY	17 @	—
BORAX—Refined, in carload lots	7¼@	7⅝
Powdered " " "	7¼@	
Concentrated " " "	— @	6¾
All grades jobbing at an advance.		
COPPER—		
Bolt	21 @	22
Sheathing	22 @	24
Ingot, jobbing	15 @	16
do, wholesale	13@	14
Fire Box Sheets	22 @	24
LEAD—Pig	4 ½@	—
Bar	5 @	—
Sheet	7 @	—
Pipe	6 @	—
Shot, discount 10% on 500 bags Drop, ℔ bag	1 45 @	—
Buck, ℔ bag	1 65 @	—
Chilled, do	1 85 @	—
STEEL—English, lb	16 @	20
Canton tool	9 @	9½
Black Diamond tool	9 @	9½
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4¼@	—
TINPLATE—B. V., steel grade, 14x20, P. S	4 80 @	—
B. V., steel grade, 14x20, spot	4 85 @	—
Charcoal, 14x20	6 25 @	6 75
do roofing, 14x20	5 12½@	5 25
Pig tin, spot, ℔ lb	21 @	21½
do, do, prompt shipment	— @	—
COKE—Eng., ton, spot, in blk & sks, resptvly	17 00 @	20 00
Do, do, to load	13 00 @	13 25
QUICKSILVER—By the flask	— @	47 50
Flasks, new	@	—
Flasks, old	3⅝ @	—

	Spot.	To Load.
IRON—Glengarnock ton	27 00 @ —	27½@ —
Eglinton, ton	26 00 @ —	26½@ —
American Soft, No. 1, ton	— @31 00	31½@ —
Oregon Pig, ton	— @30 00	— @ —
Clay Lane White	— @ 24 50	25 @ —
Shotts, No. 1	28 50 @29 00	— @ —
Bar Iron (base price) ℔ lb	2¾@ 3	— @ —
Chrome iron ore, ℔ ton	— @10 00	— @ —

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$19 00	$16 00
41 to 50 ft	20 00	17 00
51 to 60 ft	22 00	19 00
61 to 70 ft	22 00	22 00
1x3, fencing	21 00	18 00
1x4, "	20 00	17 00
1x3, 1x4 and 1x6, odd lengths	18 00	15 00
Second quality	16 00	14 00
Selected	23 00	21 00
Clear, except for flooring	30 00	27 00
Clear for flooring	1 00	.....
Clear V. G. No. 1 flooring	5 00	.....
Firewood	13 00	9 00
Dressed Pine, flooring, No. 1, 1x6	31 00	28 00
No. 1, 1x4	33 00	29 00
No. 1, 1¼x4, 1¼x6, and odd sizes	36 00	32 00
All sizes, No. 2	26 00	23 00
Stepping, No. 1	43 00	34 00
Stepping, No. 2	33 00	24 00
Ship timber and plank, rough	26 00	17 00
Selected, planed 1 side, at ⅛ to 40 ft	28 00	23 00
" " 2 " " "	30 00	25 00
" " 3 " " "	32 00	27 00
" " 4 " " "	34 00	29 00
Deck plank, rough, average 35 ft	34 00	31 00
Dressed, average 35 feet	39 00	34 50
Pickets, rough, B. M	19 00	16 00
½x1½, 4 ft long, ℔ M	5 50	4 00

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	$ 7½ @ 7½	Cardiff	9 50@10 00
Liverpool Sc'm	7 50 @ 7 75	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	8 00 @ 8 50	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Gilman	6 00
Scotch Splint	9 00	Seattle	6 00
West Hartley	11 00	Coos Bay	5 00
Greta	8 00	Cannel	10 00
Westminster Brymbo	9 00	Egg, hard	17 50
Nanaimo	9 00	Cumberland, in sacks	19 00
Sydney	8 00	do, bulk	18 00
Jackson	6 00		

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Alta, Sept. 9, $23,000; Con. Cal. and Virginia, 7, $42,997; Hanauer, 3, $1900; 4, $3300; 5, $3100; Occidental Con., 7, $13,059; Justice, 7, $8306.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. C. HOAG—San Francisco.
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W. W. THEOBALDS—Central California.
GEO. WILSON—Sacramento Co.
E. H. SCHAEFFLE—El Dorado and Placer Cos.
DR. W. F. DRAKE—Sonora, Cal.
FRANK S. CHAPIN—Lassen Co.
SMITH MCMULLIN—Humboldt Co.
A. F. JEWETT—Tulare Co.
ROBERT M. MAPPES—Fresno Co.
E. L. RICHARDS—San Diego Co.
JULES BAUMANN—Arizona.
H. G. PARSONS—Nevada.
WM. H. HILLEARY—Oregon.
F. C. ROBERTSON—Oregon and Washington.
W. B. FROST—Utah.

BOILER EXPLOSION.—A very disastrous boiler explosion occurred at the factory of the California Sash & Door Co., Oakland, on Tuesday, by which half a dozen men were killed and a number of others injured. The steel boiler which exploded was of Eastern manufacture, and had been in use about a year and a half. The safety valves were set at 85 pounds. A wire rope slipped off the pulleys just before the explosion and the engines were slowed down. During this time the steam ran up and the boiler exploded. About 250 men are thrown out of work.

ONE of the gas wells at Stockton is down 1250 feet. The deposit at that depth is a hard, close gravel that is much water-worn and belonged to an ocean bank or bed of a river. Some fine specimens of black oak petrifaction were brought up last week.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Argenta M Co	Nevada	19	10	July 20	Aug 21	Sept 16	E M Hall	314 Montgomery St
Best & Belcher M Co	Nevada	44	25	Sept 11	Oct 16	Nov 6	L Osborn	309 Montgomery St
Bulwer Con M Co	California	6	25	Aug 6	Sept 12	Oct 10	L Osborn	309 Montgomery St
Calaveras Blue Gravel M Co	Cal	3	3	Aug 3	Sept 16	Oct 2	B Burris	240 Montgomery St
Challenge Con M Co	Nevada	5	50	Aug 6	Sept 9	Sept 30	C L McCoy	329 Pine St
Con New York M Co	Nevada	1	25	Aug 14	Sept 18	Oct 9	C E Elliott	309 Montgomery St
Del Norte Gravel M Co	California	2	7	Aug 24	Oct 1	Oct 26	J B Cronan	230 Montgomery St
East Mt Diablo M Co	California	5	10	July 18	Aug 22	Sep 16	R W Heath	312 Pine St
East Sierra Nevada M Co	Nevada	1	10	Aug 8	Sept 13	Oct 7	G R Spinney	310 Pine St
Gray Eagle M Co	California	14	4	Aug 13	Sept 16	Oct 8	O H Bogart	317 Pine St
Golden Fleece G'v'l M Co	California	14	17 00	May 21	July 20	Sep 16	W. J. Gleason	806 Market St
Grand Prize M Co	Nevada	21	30	July 27	Aug 30	Sep 20	R R Grayson	327 Pine St
Kentuck M Co	Nevada	15	30	July 30	Sept 2	Sep 20	J W Pew	310 Pine St
Keyes M Co	Nevada	4	30	Aug 27	Oct 1	Oct 21	J H Sayre	328 Montgomery St
Mineral King M & M Co	Arizona	3	10	Aug 22	Sept 24	Oct 21	P H Leonard	419 California St
Mono M Co	California	28	50	July 24	Aug 28	Oct 1	B L Burling	309 Montgomery St
Overman S M Co	Nevada	60	25	July 27	Aug 30	Sep 20	G D Edwards	414 California St
Peer M Co	Arizona	8	10	Sept 4	Oct 10	Nov 5	A Waterman	309 Montgomery St
Palesade S M Co	Nevada	1	10	Aug 6	Sept 16	Oct 2	D Buck	309 Montgomery St
Scorpion M Co	Nevada	1	10	Aug 8	Sept 13	Oct 7	G R Spinney	310 Pine St
Southern Cal Coal & Clay Co	Cal	2	10	30	Aug 16	Sept 16	Oct 16	W G Mugan	10 California St

MEETINGS TO BE HELD.

NAME OF COMPANY	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING	DATE
Golden Fleece Gravel M Co	California	W J Gleason	Phelan Block	Annual	Sept 26
Eagle M Co		O H Bogart	327 Pine	Annual	Sept 18
Booth G M Co		G R Spinney	310 Pine	Annual	Sept 20
Grand Prize M Co	Nevada	R R Grayson	327 Pine	Annual	Sept 17

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Caledonia M C	Nevada	A S Chemiuant	328 Montgomery St	05	Aug 5
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	Sept 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	Aug 25
Idaho M Co	California	Grass Valley		7.50	Sept 5
Navajo M Co	California	W Pew	310 Pine St	10	Apr 1
Pacific Borax Salt & Soda Co	California	A H Clough	200 Montgomery St	1 00	Aug 10

Mining Share Market.

On last Friday the bears made a raid on Mexican, sending the price down nearly 30 per cent, causing the balance of the market to fall off in sympathy. At the close a small rally set in which was followed by another raid the next day, from which it recovered under buying from chippers and a few others who had to meet their contracts. On Tuesday the market opened dull and easy, at lower prices, continuing weak and unsettled throughout the day. Under strong bear points there was free outside selling. At the close of the day a small rally set in, which was followed by a slight gain in prices yesterday (Wednesday) morning. On a report of an assessment levied on Best and Belcher, the price of that stock, Ophir, Mexican, and other North End stocks shaded off, but Yellow Jacket and the other Gold Hill stocks held strong, as if the pool were standing under them. In the afternoon board, the North Enders receded another point, but the Gold Hills advanced slightly under strong sustaining orders. The market, as stated last week, appears to be shaping itself for another upward turn, how much each person must be his own judge. There is no doubt but the pool has some cheap stocks to sell at a profit preparatory to levying assessments, and if the public take hold freely the move will be short-lived for the present, at least. The daily papers are just beginning to publish as news that given in the MINING AND SCIENTIFIC PRESS of Aug. 24th. In that issue of the PRESS additional news to that given by the daily papers regarding proposed work on the Comstock was given, which our contemporaries will soon give as original news. In the outside stocks the Tuscaroras made an upward move under the leadership of Commonwealth. The manipulators of these stocks are reported to have bought back at lower prices than they unloaded large blocks of the stocks, which, no doubt, they are preparing to let out again at a good profit. The Quijotoas and Bodies have been dull, weak and unattractive. Eureka Con. fell back without warning 50 per cent. For Silver King a quotation was not made at any time during the week.

One of the favorable signs of the times is the attention the New York papers are beginning to give to mining stocks.

Col. John W. Mackay is expected to arrive on the Comstock on next Saturday. It is said that after visiting the mines in which he is chiefly interested he will come to this city.

From the mines the news is mostly a repetition of last week's advices. The work going on in the Gold Hill and middle mines is of an important character. The connection in Con. Imperial of the 300-foot level with the old Con. Imperial shaft is very important, for it will admit of the starting of a west crosscut for the gold ledge lying to the west. The west drift in Yellow Jacket and the west crosscut in Challenge are being driven ahead as fast as possible so as to cut the gold ledge at an early day. The work going on in Crown Point and also in Alpha deserves careful watching. More extensive exploratory work will be inaugurated at an early day in all the mines running from Gould and Curry south. Active and important work is under way in the middle mines. From the mines lying north of Gould and Curry, no news of importance is at hand. Many experienced miners still have faith in an ore development in Mexican, as soon as they commence crosscutting to north drift from the west crosscut No. 1, in Mexican. From the Alta group nothing of interest is at hand. From the outside mines the same old stale reports come to hand, hardly worth the paper they are printed on, so far as giving any information to stockholders.

THE ACCIDENT AT GOLDEN.—Eleven men were buried alive by a cave on Monday at a coal mine near Golden, Colorado, and there is no hope of rescuing them. It appears that the miners were engaged in running a tunnel under Clear creek to strike a vein in the opposite bank. During the day they observed water dripping into the tunnel, but paid no attention to it. About 5 o'clock the engineer on the surface received a hurried signal to lower the cage, which he did. The cage went down part of the way and stopped. On being drawn up, he found it to be wet. A man then went down and found the lower half of the mine flooded with water, an investigation showing the old upper level of the mine had given way, letting the waters of the creek down the main shaft, instantly flooding the lower 400-foot level and drowning all the miners working there.

FROM a dispatch received from Tacoma, W. T., it is learned that there is strong probability of serious trouble at the Carbonado coal mines.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 21.		WEEK ENDING Aug. 31.		WEEK ENDING Sept. 4.		WEEK ENDING Sept. 11.	
Alpha	1.15	1.35	1.25	1.35	1.35	1.60	1.25	1.40
Alta	1.30	1.45	1.25	1.50	1.40	1.65	1.50	2.00
Andes	65	.75	.70	.80	.70	.80	.70	.70
Argenta	....	....	....	....	....	....	....	....
Belcher	2.75	2.95	2.90	3.10	2.90	3.40	2.80	3.00
Best & Belcher	3.40	3.80	3.60	4.00	3.60	4.10	3.40	3.75
Bullion	.65	.70	.65	.70	.65	.85	.60	.70
Baltimore	.30	....	.30	....	.25	.30	....	....
Belle Isle	....	....	....	....	....	....	....	....
Bodie Con	.85	.95	.85	.95	.90	1.00	.90	1.00
Benton	....	....	....	....	....	....	....	....
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.10	.15	.10	.15	.10	.15	.30	.35
Commonwealth	2.50	2 60	2.50	2.60	2.50	2.50	2 50	3.25
Con. Va. & Cal	71	72	7⅞	7⅞	7⅞	8	7⅛	7⅝
Challenge	1.80	2.15	2.00	2 20	2.00	2.50	2.00	3.40
Chollar	1.80	2.10	1 95	2.20	2.15	2.55	2.00	2.20
Confidence	6	7	6.50	....	6¼	62	6¼	6⅜
Con. Imperial	.50	.55	.50	.55	.50	.55	.45	.50
Caledonia	.20	....	.25	....	.25	.30	.30	.30
Con. Pacific	.40	....	....	....	....	....	....	....
Crown Point	2.70	3.20	2 90	3.35	3.00	3.50	2.90	3.30
Crocker	.40	....	.35	.45	.45	.60	.55	.60
Central	....	....	....	....	....	....	....	....
Dudley	....	....	....	....	....	....	....	....
Eureka Con	1.35	1.50	1.40	2.75	....	....	....	....
Exchequer	.65	.70	....	.65	.65	.80	.60	.65
Grand Prize	.35	.45	.35	.65	....	....	.65	.80
Gould & Curry	1.95	2.10	2.00	2.20	2.15	2.60	2 15	2.20
Hale & Norcross	2.90	3.15	2 95	3.20	3.20	3.80	3.10	3.20
Holmes	....	....	.50	.60	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Iowa	....	....	....	....	....	....	....	....
Julia	.25	....	.30	....	....	....	....	....
Justice	1.45	1.60	1.40	2.00	1.60	2.00	1.60	1.85
Kentuck	.95	....	.90	.95	1.25	1.50	1.20	1.25
Lady Wash	.35	....	....	....	.35	.40	.40	.45
Locomotive	.10	....	....	....	....	....	....	....
Mono	.35	.60	.55	1.10	.90	1.20	.95	1.00
Mexican	3.15	3.60	3.40	4.4[illegible]	4.25	5 00	3.60	4.20
Mt. Diablo	....	....	....	....	....	....	....	....
Navajo	.25	.30	.25	....	....	....	.35	.40
North Belle Isle	.80	.85	....	....	.75	.80	.80	.90
New Queen	.80	.90	.70	.75	.60	.70	.65	.85
Occidental	1.80	1.95	1.85	1.95	1.80	1.90	1.55	1.75
Ophir	4.75	5[illegible]	4.85	5.25	4.80	5[illegible]	4.80	4 90
Overman	.75	.90	.75	1.20	....	1.40	1.15	1.25
Potosi	1.50	1.70	1.50	....	1 60	1.90	1.50	1.55
Peerless	.25	.35	.30	.35	.35	.45	.40	.40
Peer	.15	.20	....	....	.20	.30	.15	.20
P. Sheridan	....	....	....	....	....	....	....	....
Silver Star	....	....	....	....	....	....	....	....
Savage	1.50	1.80	2.10	2.25	2 35	2.85	2 15	2.40
S. B. & M	1.65	1 90	1.80	1.90	1.80	1 05	1 65	1 80
Sierra Nevada	2.60	2.80	2.60	3.10	2.90	3.50	2.75	3.00
Silver Hill	.40	.50	....	....	.45	.55	.40	.45
Silver King	....	....	....	....	....	....	....	....
Scorpion	....	....	....	....	.15	.20	.15	.15
St. Louis	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	....	....	....	....
Union Con	3.00	3.30	3.25	3.95	3.30	4.20	2.80	3.30
Utah	.95	1.10	1.05	1.20	1.10	1.30	1.05	1.15
Weldon	....	....	....	....	....	....	.25	.30
Yellow Jacket	3 00	3.30	3.00	3.30	3.25	3.50	3.15	3.40
	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY, Sept. 12, 9:30 A. M.:

200	Gould & Curry	200	2.20
250	Alta	10	Hale & Nor	3.30
50	Andes	75c	500	Justice	1 85
100	Alpha	1.45	50	Kentuck	1.45
150	Belcher	3.05	850	Mexican	3.95
400	Best & B	3.60	1200	New York	25c
100	Belle Isle	15c	100	Occident	1.75
10	Benton Con	4 00	220	Ophir	4.80
500	Caledonia	30c	300	Overman	1.25
380	Challenge	3.55	350	Scorpion	25c
100	Chollar	2.20	50	S. B. & M	2.80
100	Commonwealth	3.20	100	Sierra Nevada	2.80
250	Crown Point	3.30	450	Union	3.15
850	Con. Imperial	50c	400	W Comstock	40c
300	E. S. Nevada	20c	450	Yellow Jacket	3.50
100	Grand Prize	75c			

AN EARTHQUAKE startled the village of Florence, Wis., early Sunday morning, Sept. 8th. A rumbling was heard and a crack three inches wide made in the great dam across the Fox river, belonging to the Van Northwick Rogers pulp and paper mills. The sluice-gates were immediately opened to save the dam. The mill and machinery were damaged to the extent of several thousand dollars.

THE stampede to the Swauk gold district, 25 miles north of Ellensburg, W. T., is increasing. The lode, which produced from $100 to $700 nuggets, it is confidently believed, is at last found.

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Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

For special reasons we here give prominence to the above notice. It has appeared in the above form in nearly all, if not every, issue of our journal for over one year past. Yet we are *occasionally* finding subscribers who say they have never seen the notice. Although they have received our paper constantly, or are knowing to its being mailed regularly to their address, they refuse to pay for it. Their excuses are various, viz.: "Never subscribed for it;" "subscribed only for the year paid for;" "told some agent to stop it;" "told the postmaster to stop it," etc. Through 24 years of careful and successful business, the proprietors of this journal have *never, knowingly or willfully, sent a newspaper to any person they knew at the time did not wish it, and we never will*, unless such person *unwarrantably* refuses to pay arrearages when able to do so.

No doubt we have been too obliging in retaining names once entered on our list of those whom we supposed desired to continue after the date paid for had passed. This, however, is owing to several reasons. Our paper is devoted to a cause that should entitle it, as long as devoted and true, to the friendship, goodwill and protection, if not the substantial support, of the individuals and classes whose welfare it sincerely strives to promote. The relations are such as should inspire mutual confidence and trust between publishers and subscribers.

While some are displeased to have a single copy of this paper sent beyond the time paid for, others are more lastingly offended at what they consider a breach of confidence, if the paper is stopped without their special order.

We shall be more careful than ever of sending this paper on credit in the future. Shall endeavor to employ none but *honest* and *careful* agents. Yet, if mistakes or discrepancies do occur, of any kind, we ask the favor of every subscriber to notify us promptly by LETTER (carefully stamped) or POSTAL CARD, with the full assurance herewith that we will not, knowingly, send the paper to any one who does not want it.

Those who report having written the publishers to stop their paper, before becoming angry about its not stopping, should remember it is far more likely that their letter never reached the publishers than that they would attempt to do business on so unsafe a plan as to continue to trust a subscriber whom they knew had written to stop it. In this connection we repeat the following points about stopping papers, some of which we know have been missed by very good and well-meaning and tolerably careful subscribers.

About Stopping this Paper.

In sending word to the publishers, you should be particular to note all of the following points: 1st, to send it to the P. O. by a trusty hand; 2d, to be sure you have a stamp on it; 3d, that it is correctly addressed; 4th, that your name is plainly written; 5th, that you give the name of your P. O.; 6th, that you give the name of the paper (or we should have to look over the long lists of subscribers on several newspapers). If your letter reaches us with the above 5th and 6th points overlooked, we should have to look over thousands of addresses to find your name to discontinue your paper. By missing one or more of the points above numerated on the part of subscribers, we are doubtless often blamed for not stopping papers when it is impossible for us to do so—and in many cases receive no intimation even about the matter.

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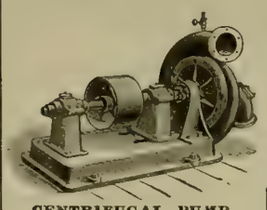
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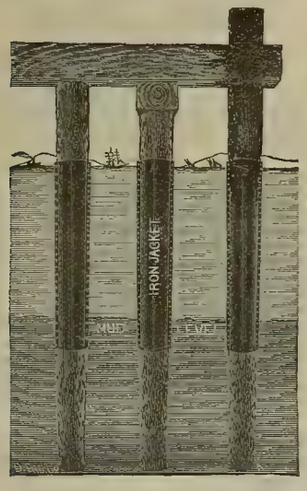
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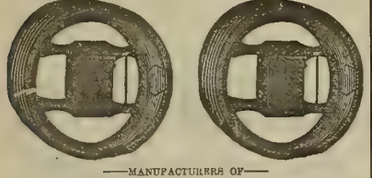
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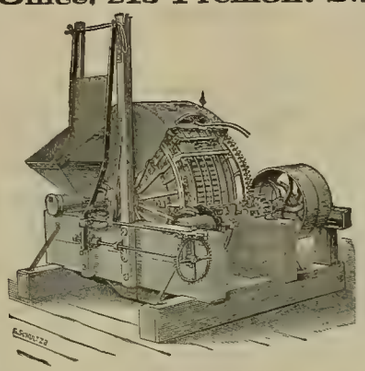
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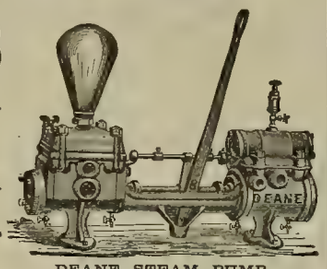
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COAL MINES OF THE WESTERN COAST.

A few copies of this work, the only one ever published treating of Pacific Coast Coal Mining, have been obtained, and are for sale at this office for $2.50 per copy. It was written by W. A. Goodyear, Mining and Civil Engineer, formerly of the California State Geological Survey.

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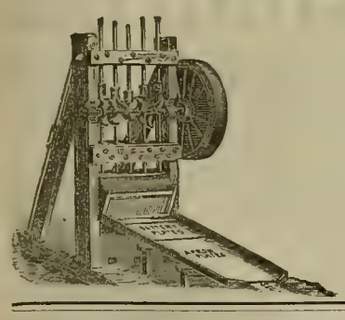
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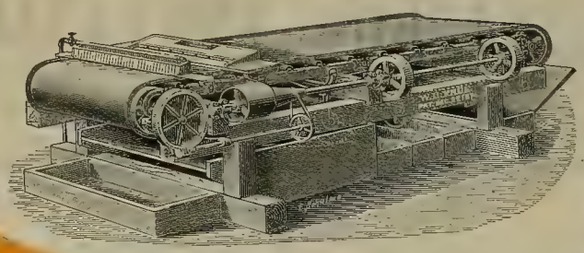
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THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

ADAMS & CARTER, Agents FRUE...NG MACHINE CO., Room 15, No. 132 Market Street, San Francisco, Cal.

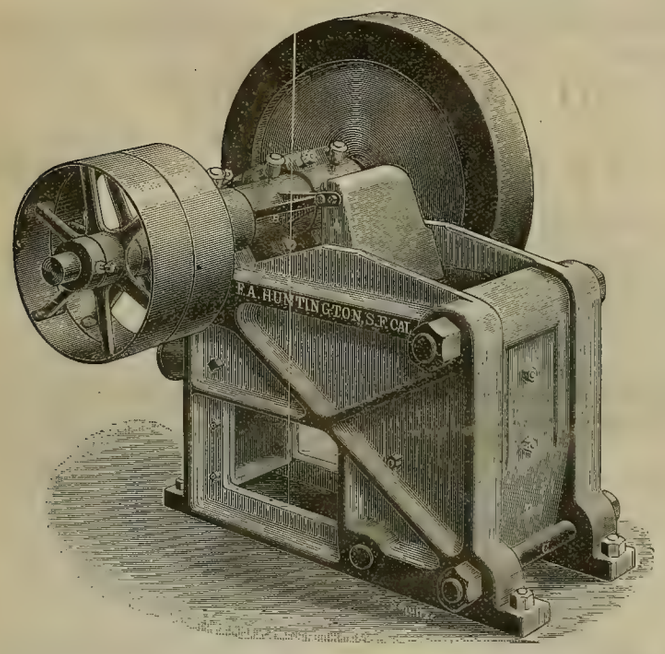
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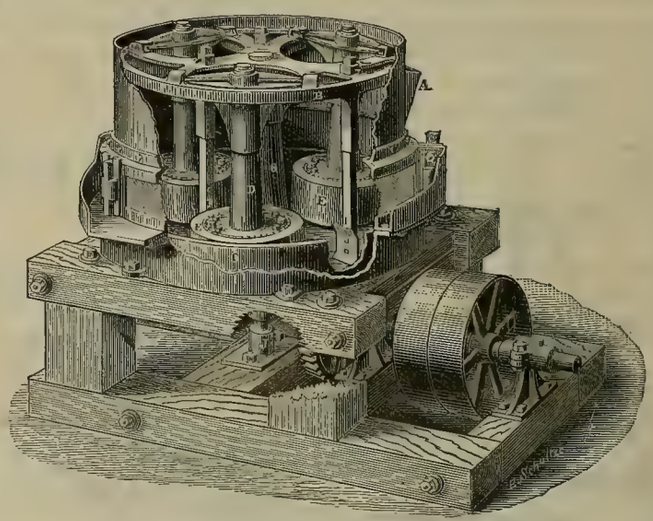
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Huntington's Improved Rock-Breaker.

The main features of this machine are strength, ease of adjustment and simplicity of construction.

The movable jaw *A* is worked by the eccentric *B* and is pivoted at the bottom. The stationary jaw *D* is secured at the top by a bolt running through it, and at the bottom bears against the heavy bolt *C*. The main wear is, of course, at the bottom of a breaker of this form, and the wear is easily taken up by inserting a plate between the bolt *C* and the jaw *D*. The jaw is thus swung in at the bottom, and the opening where the ore passes through is made correspondingly smaller. As will be seen by the cut, this machine is of very simple construction and is strong and durable.



F. A. HUNTINGTON'S
Centrifugal Roller Quartz Mill.

The following will explain the above cut:

The ore and water being fed into the mill at the hopper *A*, the rotating rollers and scrapers throw the ore against the ring die, where it is crushed to any desired fineness by the centrifugal force of the rollers as they roll over it.

The water and pulverized ore are thrown against and through the screens when fine enough. The discharge is so perfect that it makes little or no slimes, and leaves the pulp in good condition for concentration. The rollers are suspended, leaving a space of one inch between them and the bottom of the mill, thus allowing them to pass freely over the quicksilver and amalgam without grinding it or throwing it from the mill, while it agitates it sufficiently to make amalgamation perfect. For wet crushing and gold saving it has no equal.

I claim especial merit in that feature of this system *which prevents* ALL FLOURING of gold and quicksilver, and the consequent loss of gold that attends stamp milling.

For the economical working of ore that contains sulphurets, I particularly claim the adaption of this mill. The rotary method of crushing the ore so granulates the pulp (which is discharged the moment it is crushed) that a complete concentration of sulphurets is rendered most easy.

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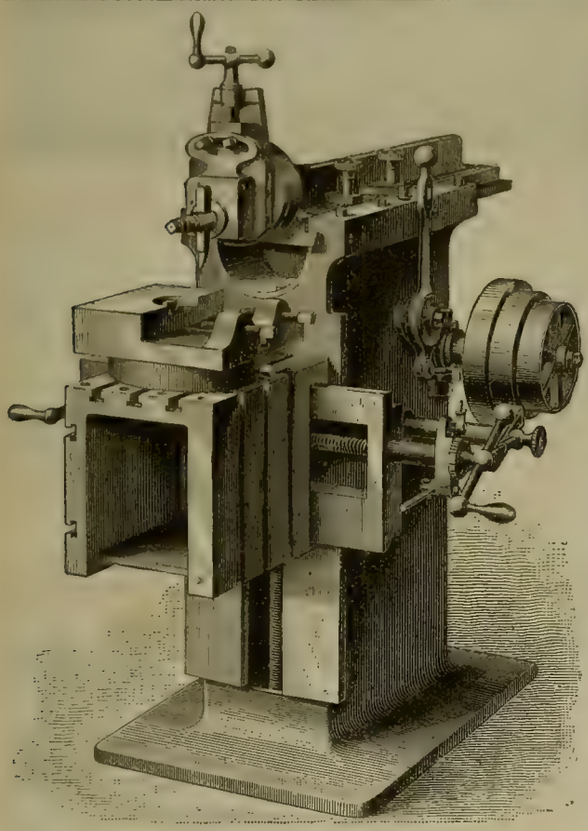
An Illustrated Journal of Mining, Popular Science and General News.

TWENTY-PAGE EDITION.

VOL. LIX—Number 12
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, SEPTEMBER 21, 1889.

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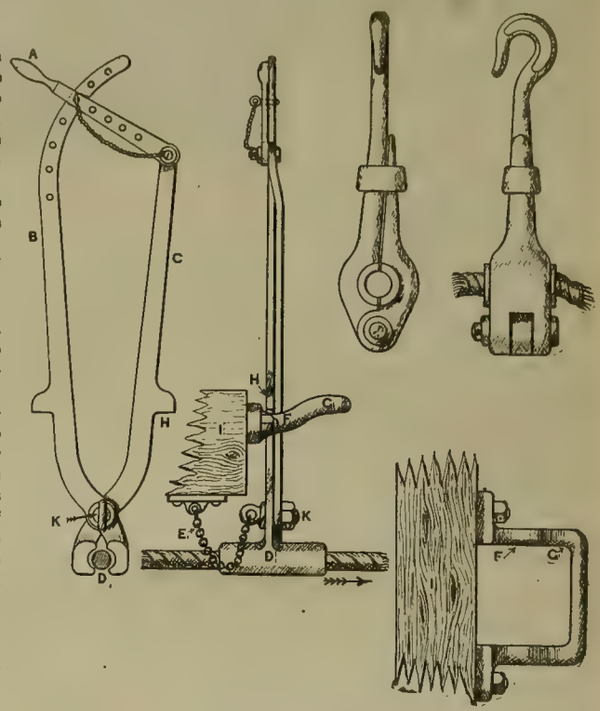
PRENTISS FRICTION SHAPER.

Prentiss Friction Shaper.

The stroke of the Prentiss friction shaper, shown on this page, can be readily changed while in motion to any length from ¼-inch to its full extent, by simply shifting the tapets or dogs, similar to those on a common planer. There are two different speeds for cutting either steel or the softer metals. The return stroke is 40 per cent quicker than the cutting stroke. It is driven by means of two belts, one open and the other closed. The grip is produced by two leather surfaces brought together in such a manner as to cause the grip to tighten in proportion to the resistance of the work. The machine is, therefore, able to take an exceptionally strong cut, in fact, all the driving-belt can pull without danger of slipping. The friction feed does not consume any power when not feeding. The Parke & Lacy Co. of this city have recently taken the agency of these machines, which are made in three sizes, planing in width from 16 to 22 inches, and hight, 18 inches.

Attaching Mine Cars to Ropes.

Much time and ingenuity have been employed in devising convenient grips for attaching cars to the moving rope in underground haulage, but those which have been found the most serviceable in mining operations are of the simplest character and among the first employed. On this page illustrated a grip which may be employed when it is desirable to start and stop the cars without interrupting the motion of the rope. Two levers *B* and *C*, acting on a pivot *K*, with jaws *D* for gripping the rope, are actuated by the link *A*. In order that the grip may pass over the supporting rollers, it is necessary that the rope, when gripped, be elevated above the rollers. To this end, the *U*-strap *FG* is attached to the bumper of the car, and the grip levers *B* and *C* are provided with lugs *H*. A chain *E* forms the link between the grip and the car, by means of which motion is transmitted to the car. In the illustration *I* the grip is in its lowest position, about to seize the rope. The operator, standing on the bumper at the front of the car, now presses the lever *A* and closes the jaws *D*. The rope, moving in the direction of the arrow, carries the grip with it until the chain *E* is taut. By this horizontal motion of the grip, the lugs *H*, resting and moving on *F*, are raised to the level of *G*, and the grip and rope are likewise elevated.



GRIPS FOR MINE CARS.

Where starting is performed at stated points, the following device may be employed: A grip similar to the foregoing is fixed by a bolt, *K*, to the bumper of the car. The jaws are about one and a half inches above the level of the rope when resting on the supporting rollers.

In many mines it has been found more convenient to adopt such arrangements that the rope is stopped for attaching and detaching. For this purpose the device shown in the upper right-hand figures of the cuts is recommended by Mr. F. C. Roberts of Philadelphia, from whose paper on "Wire Rope Haulage and Its Application to Mining" we take these notes.



VIEW OF CORINTO HARBOR, NICARAGUA

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Sights and Experiences in Paris.

EDITORS PRESS:—I learned before I came to France that the farmers had no division fences, but could not fully comprehend it until I saw that it was so. In coming from Bolougne to Paris I hardly saw a division among the farmers by fence. I do not know how they mark their lines. I do not know how they raise their cattle and horses. I occasionally saw their cows tied to a stake with ropes, but that would not do where they are raising any considerable number of stock. They have a few hedges, and they are mostly to mark large divisions, public, or railroads.

With all the wine and beer-drinking, and it seems universal in this city, I have not seen but a few persons under its influence any more than to make them very strong talkers. Every afternoon thousands of persons of both sexes may be seen sitting in saloons and on the adjacent sidewalks around little iron tables drinking wine and beer, and chatting as though they had just won a fortune, or were expecting to very soon. Country and city people go to the Exposition and take their little picnic baskets made especially and tastefully for the occasion, in which is one or two bottles of wine, glasses, napkins, a case-knife and bread. They sit down in little groups on benches, or on the grass, and make a business of it as though it was one of their important meals, and you will see the smallest of children indulging in wine in their mothers' laps. To show you that wine is the national beverage, and they only use water to wash the streets, irrigate land, and play their numerous fountains, I will say that I only saw drinking cups at two hydrants in their vast grounds in the Exposition, nor do you see them anywhere on the streets.

While on the subject of drinking, I presume bread eating will naturally follow. Bread is the real staff of life in France. I think no one but regular bakers make it, and they are very numerous. They do not put their artistic style in its manufacture as they do in other things, for I cannot recall but about three patterns of loaves. One is hot rolls, and we have them for breakfast (American breakfast, not French; 8 o'clock instead of 12 o'clock), and a loaf about one foot long by four inches thick, and a loaf in length according to the purchaser's purse and carrying capacity. It is a common thing to see bread three and four feet long, and about the size of a man's arm; but when I saw the champion loaf the other morning from my window, I thought I would order a few of them sent to some of my short friends in California. A woman of ordinary hight was carrying a loaf of bread in military or perpendicular style, and just held the lower end from touching the sidewalk, and may hops be not (over) 50 cents a pound this fall if the top of that loaf was not one foot above her head.

Living is considerably cheap considering the attractions this year. Most everybody lives at restaurants. We always have taken breakfast at the hotel, and now we take breakfast and dinner. We tried the restaurant a few times, but did not like it at all. They are too slow for the Yankee, and it was difficult to make them understand our order, also in making change. They take a little black coffee and bite of bread in their rooms in the morning, and some of them while in bed, breakfast at 12, and dinner at 6 or 7 o'clock in the evening. They will sit and sup and talk for hours over a radish one and a half inches long, one sardine, a little soup, a regulation loaf of bread, a little wine and a good deal of French atmosphere.

We order what we like and have it brought to a little dining-room adjoining our bed-rooms. We take turns in giving orders and usually try and surprise the rest until it is on the table. One of the most annoying things is the tip or service to the stranger. The waiters in the Exposition have stated that they had to give to the proprietor every morning before going to work, six francs. After paying for your wine or lunch you are expected to fee or tip the waiter from ten to five cents, according to size of the party. The American coming here and not knowing this custom gets into a Babylon of talk, and the Frenchman puts him down as penurious and mean. Going into a barber-shop for a shave, who knows whether the man that shaves you is the proprietor or hired? I give him a piece large enough to cover all demands and he returns change. If he is proprietor, shall I still tip him?

A French Bath.

I took a bath the other evening and laid down ample means, as I supposed, to cover all expenses. I was shown the room and there were no towels or soap. I succeeded in making the men know that something more than water alone was necessary for a good bath. When I came out the Frenchman was at the door, and jabbered something not comprehended by me. As I had learned, money was a great reconciler of all passions and desires. I handed out some pennies as a test, when he said, no—no—no. I motioned for him to follow me out to the old woman at the office. They talked it over. I threw down more coppers and the Frenchman got more excited than ever. I raked in the coppers and threw down two francs. The old lady made change and took out 12 cents. I thought then I could depart in peace. Not so; the cry still came for more. For a moment I absolved myself and laid up on a shelf my early Christian or Sabbath-school training. I never felt more like owning and controlling an establishment than I did that. There was no fault about the price. Twice I laid down enough money to cover all expenses. It appears they charge for the room and water, then for towels and soap, and then a tip for the waiter. Great big finely-dressed men will hold out their hands for a tip if you neglect them. It seems very humiliating to a person not accustomed to such a fashion.

I like to pay my full bill at one time, and get a clean receipt, and be entitled to the freedom of the boat, cars, hotel, or nation. Some of the cabmen expect a tip. About the only men who do not get tips are the men who receive our tickets at the gate, and the car conductors. When you get out of a cab that has a door to it, a man or boy will run up and open it and want a tip.

How the French Treat Horses.

Every Percheron horse sent over to the States should raise a prayer for deliverance out of the hands of these heartless Frenchmen. They are cruel task-masters to the defenseless animals, and there is not a moment in the day but what I can hear the loud cracking of their long lashes, sounding more like the explosion of a firecracker. They use long curb bits, with chain under the jaw, on every horse regardless of necessity. On one of the cabs I saw his register was 12,744, so that will give a faint idea of the number of horses employed in this city. They use three horses abreast on nearly every bus and frequently three on the cars, and there are thousands of them, to say nothing of the private teams, carts and wine trucks.

Hauling Wine.

A wine truck is a curiosity to me, and I will tell you how a Frenchman moves his wine in casks. He has a pair of heavy wheels about five feet high with a strong iron axletree. He uses two timbers 4x8 and 25 or 30 feet long. These are placed on springs, about three feet apart, across the axletree. The heavy shafts are fastened on the outside to the forward end of these timbers by a rod, forming a joint or swivel, so the rear end of the truck car fall to the ground, at the will of the teamster to receive a load of casks, while the forward end cannot go down only on a line with the shafts. On the forward end is a windlass with stationary levers eight feet long for tightening the rope around the casks.

At the rear and outside of these timbers are large pins, with knobs fastened every three feet for a distance of ten feet. These knobs are to assist in bringing up the rope immediately close to the last cask to be fastened or lashed on. When there is no load or partial load, the driver has a chair that he places in front and mounts. Under the axletree there is a swinging-box, say one foot deep by five square, where small things are carried. At the rear of the axletree, at right angles with the timbers (and under them) is fastened a chest with lock for wine, lunch, etc. Not content with having eight and ten casks on top, he will frequently sling three and four empty casks under the truck between wheels and horse. One horse usually moves this load, and it presents a comical sight to the stranger.

Items.

There are no telegraph-poles in sight. All the wires pass in tubes under the sidewalk.

The sidewalk is not obstructed by hydrants. Water-pipes are under the sidewalk and access is gained by raising little iron doors or gratings. Streams of clear water are seen running down the gutters, while men and women with brush-brooms are sweeping the dust into these streams to be carried into the Seine.

Clothes washing is done by men and women on the Seine on long floating barges. A small fee is charged for use of hot water.

One of the curiosities in mechanics in this city was a folding hand-cart. Grocerymen and fruit-venders have small hand-carts for the distribution of their merchandise. I suppose for the want of space in this busy city some genius has devised a cart that he could close up like a jack-knife and store away in a narrow space.

Admission tickets to the Exposition are sold on the streets everywhere and by everybody. If they are purchased at the office they cost one franc, and it takes two francs for admission before 10 A. M., and one franc after that time. At two different times I bought six tickets for two francs—40 cents. The usual price on the streets is half a franc, or ten cents. If I understand it correctly, tickets are issued for so many francs, say 25, with 25 coupons attacked. The purchaser of tickets can use the coupons or cut them off and sell them for what he pleases. A coupon is a ticket of admittance. This ticket has a chance in some indefinite, to me, lottery, and will be redeemed in 50 years. Tickets of admission seem too cheap. On the 14th of July, Bastile Day, 300,000 were admitted, and a few days after 114,000.

Paris. DANIEL FLINT.

THE ELEPHANT'S TRUNK.—The elephant has more muscles in its trunk than any other creature possesses in its entire body, their number being, according to Cuvier, no less than 40,000, while the whole of a man's muscles only number 527. The proboscis or trunk of the elephant, which contains this vast quantity of small muscles, variously interlaced, is extremely flexible, endowed with the most exquisite sensibility and the utmost diversity of motion.

San Francisco to Alaska.

[Written for the PRESS by GRACE STEWART.]

At 7 o'clock on the afternoon of June 8th, we were sitting in a Southern Pacific Railroad Pullman watching the lights of San Francisco and Oakland fast disappearing. Two nights and one day's travel brought us to Portland, where we changed cars to the Northern Pacific railroad, and at night reached Tacoma, W. T.

Although we nearly suffocated from the dust and intense heat, we enjoyed the scenery very much. The snow-clad summit of Mt. Shasta, which is 14,440 feet above sea level, looms up like an immense castle on a desert land. For many miles we followed a silvery, pebbled-bottom stream, which rises from the base of Mt. Shasta, crossing and recrossing it at least 20 times. Who would think this was the source of the dirty waters of the Sacramento river? Crossing the Siskiyou mountains, going into Rogue river valley, the railroad is like the trails of the Yosemite; at one time four parallel roads can be seen. After leaving Portland, for over two hours we are on the banks of that beautiful sheet of water—the Columbia river.

Although 70 miles from Mt. Tacoma, it is even a more beautiful peak than Mt. Shasta; it rises more abruptly, and is four feet higher, while the snow reaches nearly to its base. We pass farmhouses, orchards, small cattle ranges, through forest after forest, and leave many sawmills behind.

We boarded the steamer Ancon at dusk, June 11th, and at 4 o'clock in the morning the boat left Tacoma; we then felt that we were certainly on our way to the wonderlands of Alaska. In three hours we landed at the poor, burnt town of Seattle; the business portion, freight-houses and many homes, covering over 100 acres, was entirely swept away by the raging flames. Many of the merchants were moving into tents. A small restaurant was still flourishing, although nothing but the floor had been rebuilt; the cook stove and brick chimney were all that remained of the once large building. On a white canvas cloth, stretched between two charred telegraph poles, were these words in large flaming letters, "The New Delmonico." "We Still Live and Let Live."

Leaving there at 11 o'clock, we reached Port Townsend at three in the afternoon, where we remained 36 hours, taking on all kinds of merchandise, fruit, mining machinery, lumber and brick; over 50 crates of tin cans and 600 sacks of salt were going to the different salmon canneries. We went ashore and walked all over the town, which did not take very long; after climbing a flight of stairs of 123 steps, we obtained a fine view of the bay and surrounding country. Mt. Baker was a prominent snow-capped peak.

All the freight from San Francisco going to Alaska came to this port on the Walla Walla, and had to be reloaded.

Victoria.

A four-hours' sail brought us to the wharf within two miles of the beautiful city of Victoria, B. C. We stopped long enough to take a two-hours' ride about the city. The streets are all well paved; the drives and boulevards are numberless; tall shade trees shut out the sun and make it a place of rest and enjoyment. Ferns, or fine breaks, cover the ground on each side of the road, some being as high as five feet; these and a great quantity of delicate wild roses, the bushes much higher than a person's head, add much to the beauty of those country drives. Victoria has a population of 1200, and is about 40 years old, but has no street-car lines of any kind. The stores and postoffice do not open until 9 or 10 o'clock, and all usually close at four in the afternoon. We saw Chinamen—of which there are a great many—laying brick, mixing mortar, and working at all trades. The flowers were gorgeous in every yard, especially the roses and honeysuckle.

The Inland Passage.

After leaving Victoria we go through Plumpers, pass into the Gulf of Georgia; the boat winds its way between the islands until one cannot tell where we are coming out. These islands are very productive; Mayne island produces several tons of strawberries yearly. At Departure bay, two miles from the mining town to Nanaimo, we had a pleasant walk up in the woods. One hundred and fifty tons of Wellington coal was taken on board. From the head of Puget Sound to the mouth of the Chilcat river, over a thousand miles of inland sea, the ship is continually winding between and around the numerous islands covered with fir trees to the water's edge and delicate green ferns peeping out between them, lofty peaks holding their snowy caps, and the drifting clouds form a beautiful background to Nature's landscape gardening. It is like an immense park with a beautiful smooth sheet of water instead of cement boulevards. Where the strong current of the pale-green waters of the Fraser river rushes in upon the salt water, it is very noticeable. We saw several spouting whales, many porpoise and now and then a shark. On leaving Vancouver's island, we enter Discovery Pass; the tides rushing in and out of the straits of Georgia dash through the rocky gorge of Seymour Narrows at the rate of eight miles an hour; boats can only pass through in flood tide, and even then the water boils and rushes at a great rate and ships are turned out of their course by the strong and rushing currents. At other times the wind whistles through these narrows, and the water rises and falls 13 feet, although there are from 20 to 60 fathoms of water; there is a dangerous ledge of rocks in the middle of the pass on which there are only 2¼ fathoms. Only two ships have been lost passing through here, each a "man of war."

From Queen Charlotte sound to Calvert island there are 40 miles of open sea; a strong wind was blowing, causing heavy swells which drove nearly all the ladies and many of the gentlemen to their staterooms. As we again sailed among islands of indescribable beauty, the people gradually crawled out from their rooms looking paler than a few hours before.

About 4 o'clock in the afternoon the picture which lay before us was the same as described by Miss Scidmore:

"The clear, soft light, the pure air, and the stillness of the sky, and shore, and water, made it seem like the dawn of creation in some new paradise. The breath of the sea and the breath of the pine forests were blended in the air, and the silence and calm added to the inspiration of the surroundings. The eastern wall of the channel lay in pure shadow, the forest slopes were deep unbroken waves of green, with a narrow base-line of sandstone washed snowy white, and beneath that every tree and twig lay reflected in the still mirror of waters of a deeper, purer and softer green than the emerald. The marks of the spring avalanches were white scars on the face of the mountains, and the course of preceding landslides showed in the paler green of the ferns, bushes, and the dense growth of young trees that quickly cover these places. Cliffs of the color and boldness of the Yosemite walls shone in the sunlight on the opposite side, and wherever there were snowbanks on the summits, or lakes in the hollows and amphitheaters back of the mountain ridge, foaming white cataracts tumbled down the sheer walls into the green sea water."

On these islands and the main land are wild animals of many kinds. It was in this picturesque spot that we met the steamer George W. Elder making her way back to Tacoma. The long, sharp shriek of the whistle was reverberated many times. The captain, knowing that the people on board would be glad to communicate with each other, allowed the ships to go so near together that a person could step from one to the other. All the newspapers on the Ancon were quickly and eagerly read by some Seattle passengers who had been so long in the seemingly outside world and had not heard of the destruction of their city. All were eager to know what kind of a trip the Elder had; one lady remarked that there had been only one sunshiny day and that it rained *eight* days out of a week up in Alaska.

(To be Continued.)

Wonders of Nature.

Prehistoric Footprints at Carson.

EDITORS PRESS:—In a very short term at the penitentiary at Carson your correspondent saw many things to show that we are indeed a puny race compared with the men of old. A great sandstone quarry seems to have grown up on what was originally a clay deposit surrounding an old lake or pond. As plain as though made last week are the tracks of a mammoth. Careful measurement shows them to have been *twenty-one* inches in diameter. What a prize for Barnum! Why, Jumbo was a baby compared with these. Some German scientists thought that these tracks might possibly have been artificial work, as many of the convicts had exposed for sale things that showed marvelous ingenuity and patience. So the wardens of the prison blasted still farther into the quarry and exposed two or three new tracks while these doubting Thomases were looking on. At this the last trace of incredulity disappeared. The scribe did wish that some of his friends who have made so much sport of his number elevens could have seen how small they looked when standing in the moccasin tracks made by a man whose foot measured 23 inches. From this and the length of stride, it is calculated that he must have been at least *nine feet high*. Sullivan may knock out the men of his day, but how could he have met that fellow? Probably he would have had no conscientious scruples against entering the prize-ring, for up at Reno we saw a short piece of human thigh-bone not less than twice as large as that of an ordinary man, and with it part of a skull wonderfully developed behind the ears, but totally lacking above the eyes. If phrenology teaches anything, that man fought before he prayed.

His horse must have had a sorry time, being so much smaller than the man, for his tracks look very like those of the mustang that seems likely to become an extinct race so soon. In passing let us drop a tear to the memory of the horse that could go the most miles on the least feed of any that ever walked. We don't know where he came from or where he went to, but the giraffe left his tracks there. Shall we suppose that he formed part of the retinue of a Barnum or Van Amburgh in the days before the flood?

Birds were quite plenty in those days, and many of them larger than the bronze turkeys that strut so proudly at our fairs. Either wolves or dogs were there in numbers, and many clams and shellfish found homes and graves there. Farther up the rocks comes a layer of something strongly resembling slickens. I wonder how they panned out, and whether the owners of this sand-rock served any injunc-



PICKING GRAPES AND CURING RAISINS IN A RIVERSIDE VINEYARD.

tions, and how they stood on the debris question.

How the Mountains Have Been Hewn Down.

About four miles west from the prison, with the city of Carson midway between, is another wonder quite different. A cloud burst up in the Sierras a year ago, and down came a stream of water, bringing with it rocks, dirt and gravel enough to cover up the nice little ranch of Mr. Gifford, in some places 20 feet deep. We saw rocks there that he estimated would weigh 70 tons. Certainly they were very large rocks, whether they weighed all those tons or not. Mrs. Gifford was rescued from a sick-bed while the storm was coming that left much of this debris about the house, but the bulk of it in the field south. Mr. Gifford says that hardly anything in that line would surprise him any more, not even if a whole mountain should suddenly slide into the valley. F. S. C.

Amador County Mines.

EDITORS PRESS:—Throughout Amador, quartz mining is in a most flourishing condition. True, the old Plymouth has closed down, though that is but one of many and the many are pounding right along each day, but serving to show that the county's mineral wealth has scarcely been touched. Those who take in the State Fair will be given an opportunity in Amador's mineral exhibit of seeing the character of her ores and the exceeding richness of some of the same. The ores of the county are largely free-milling, carrying an average of 1½ per cent of sulphurets of an average value of $100 a ton.

The Amador reduction works at Sutter Creek treat all of the sulphurets of this and El Dorado counties, besides a large amount from other sections. Their works are the most complete in the State. Fifteen years of trial has given them the confidence of the miners; their terms are $20 a ton, 92 per cent of the assay value being given.

Each year sees new developments on the veins parallelling the mother lode, and many others in other portions of the county. With the exception of the Plymouth, there has been no time in the history of the quartz mining when the county has made so general and satisfactory a showing as at the present time.

E. H. SCHAEFFLE.

How to Save the Trout.

EDITORS PRESS:—Your correspondent in a personal interview with the superintendent of the Fish Commission, J. G. Woodbury, learned that the commission has no law empowering it to correct such destruction as is going on about Prattville, but that the County Government law passed last winter places the remedy in the hands of the supervisors. As different counties require different regulations for protection of game fish, it was thought best to place the matter in the hands of the supervisors to enact the necessary laws.

Commissioner Woodbury says people have no conception of the wholesale destruction that is going on. Much of it is caused needlessly and without excuse by the very parties who are all the time petitioning to have their streams stocked with fish. Miners, millmen and farmers are to blame; but farmers most of all. They use no screens at the head of their irrigating ditches, and so fairly manure their orchards, vineyards and meadows with young fish by the millions. Miners when hydraulicking would run them through their nozzles and beat them into pulp against the rocks just as though they were good to wash down hills with. Millmen dump their sawdust into the stream even when those who have tried it claim it is less trouble and more economical to have a furnace and burn it, as they do at Glenbrook, than to run it into the lake or bay, where it will always be in the way.

A Simple Remedy

Is to put a wire screen wherever irrigating or mining water is taken out, and to burn the sawdust instead of running it into the stream. Fish screens should be of galvanized wire cloth not larger than one-fourth-inch mesh. Such can be purchased in San Francisco at six cents per square foot. FRANK S. CHAPIN.

Big Meadows, Plumas Co.

Existing Laws.

Existing laws certainly cover some of the points made by our correspondent. The Fish Commission can require fish ladders to be provided by all owners of dams in streams frequented by migratory fish, and it is a misdemeanor not to keep such ladders in good condition.

The dumping of sawdust in streams is provided for by a new section of the Code which went into effect the first day of the present month. This we learn from a copy just received of "The Fish and Game Laws of California" (fourth edition), compiled by S. P. Maslin of Sacramento, and published by the State printer. It is an excellent piece of work and should be widely distributed. The new law concerning polluting streams is as follows:

Every person who places or allows to pass into any of the waters of this State any lime, gas, tar, cocculus indicus, sawdust, or any substance deleterious to fish, is guilty of a misdemeanor. And every person who uses any poisonous or explosive substances for the purpose of taking or destroying fish is guilty of a misdemeanor. Any person who shall catch, take, or carry away any trout or other fish from any stream, pond, or reservoir, belonging to any person or corporation, without the consent of the owner thereof, which stream, pond, or reservoir has been stocked with fish by hatching therein eggs or spawn, or by placing the same therein, is guilty of a misdemeanor.—[Approved March 4, 1889. In effect Sept. 1, 1889.]

IT is said that before the construction of the Eiffel tower began 40 draughtsmen worked nearly a year on its plans.

SAN DIEGO has 50 miles of sewer that cost the tax-payers $500,000.

Raisin-Making in California.

As we are now in the hight of the raisin harvest, nothing could be more timely than views illustrating some features of this important work. These we reproduce from a handsome publication recently issued by the Riverside Board of Trade, and though they directly portray methods in vogue in the Riverside district, they are also illustrative of the general practice of the raisin producers of California.

Nearly all California raisins are cured upon small, light board platforms, which are called "trays." Wickson's book on California Fruits says:

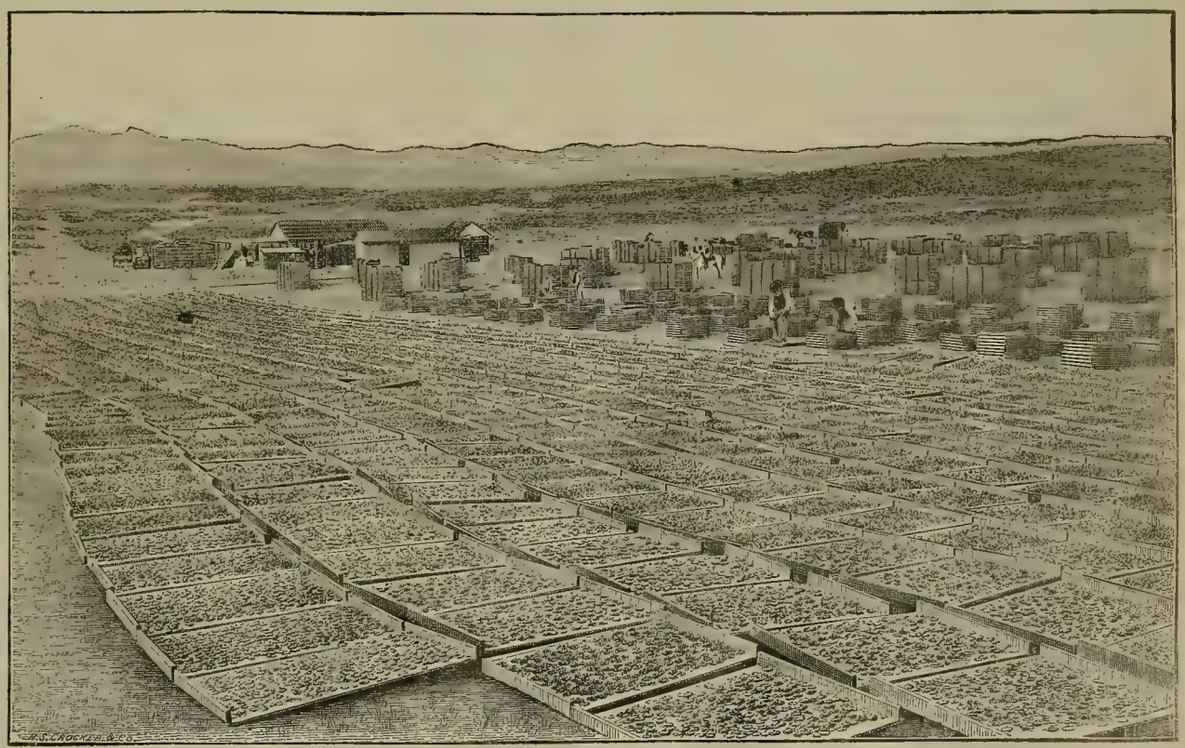
There is great variation in the size of the trays. The common small tray is made of onehalf inch sugar pine lumber, two feet wide and three long—the boards forming it being held together by nailing to a cleat on each end (1 by 1¼ inches) and a lath or narrow piece of half-inch stuff is nailed over the ends of the boards, thus stiffening the tray and aiding to prevent warping. This is the standard raisin tray and was first used for raisins by the late G. G. Briggs.

Raisin trays are sometimes made of larger size, and instead of sugar pine redwood is occasionally used. Paper trays are also somewhat employed, and various other materials have been utilized.

The two chief methods of exposure to the sun are to place the trays near the vines whence the grapes have been gathered or to clear away a large drying floor and place the trays side by side upon this open space. This drying floor is used both for tree fruits and for raisins. Our illustrations show both these methods in vogue at Riverside.

The manufacture of raisins in this State is a progressive business, and each year the producers are introducing new devices and new methods of manipulation. To readers distant from the raisin vineyards the pictures we use this week will give a good general idea of the way raisins are made.

MALODOROUS SMOKE.—At a school in Sioux City, Iowa, recently, a fur cap belonging to one of the pupils fell into a bucket of hot ashes in a closet, and clouds of malodorous smoke appeared. The teacher seized the bucket and started for the door, but was overcome by the smoke and dropped into the nearest seat almost unconscious. A boy then took the bucket, but at once succumbed and fell to the floor. Twenty of the pupils who sat where the smoke reached them were made deathly sick and were unable to rise alone. By a superhuman effort the teacher managed to get the door open, and the fresh air revived her so she helped the children outdoors, where they lay on the ground in agony. The people living near by brought fresh milk and made the children drink freely of it. At the end of three hours all had recovered sufficiently to be taken home. It is supposed there was poison in the coloring matter of the cap.



DR. JARVIS' DRYING GROUNDS FOR APRICOTS AND RAISINS, AT RIVERSIDE, CAL.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SUTTER CREEK.—Amador *Ledger*, Sept. 14: A telegram was received from Valentine in San Francisco last week giving instructions to tear down the hoisting works at the Mahoney and move them a distance down the hill, where they intend to sink a new shaft and start operations thereon immediately. This news is hailed with much satisfaction.

PLYMOUTH CON.—Beyond keeping the water out, nothing is going on at the Plymouth Consolidated. The report that the hoisting works have been sold to the owners of the New London is generally discredited, and also the rumor that a portion of the Pacific mill is to be torn down and taken to the Mulatos mine in Mexico, owned by Hayward and Hobart. All these rumors have a depressing effect upon the stock, which has now fallen to between $2 and $3 per share. That the mine will be restored to its old-time prosperity is not warranted from present indications. It looks as though Hayward and Hobart were preparing to transfer their attention from Amador to other mining fields. Carpenters were put to work building the New London mill this week. It will be pushed to completion with all possible speed. A line of five-inch pipe has been laid from Amador canal to the mill to supply battery water. The South Spring Hill Co. is putting in a separate water-pipe to the hoisting works for the purpose of operating a saw and other machinery. The rich ore which has been struck in the Gover has awakened quite an interest in mining in that vicinity. The ore has been struck in the 120 and 250 foot levels running north, and about 70 feet from the line of the North Gover. Specimens of the quartz have been sent to the State Fair.

CLOSED DOWN.—The Bunker Hill mill was brought to a standstill Monday morning, and nearly all the miners as well as the mill hands were discharged. Eight or ten men are kept at prospecting, and this is all that is going on at present in connection with this mine. The stoppage of the mill is ascribed to lack of water, but whether this is the only reason we are unable to say. The prospects of the property have not been bright of late, and the curtailment of expenses in every possible way has been deemed imperative. One great disadvantage has been that the ore has had to be run 700 or 800 feet underground. A new shaft away north of the present works is thought to be indispensable to place the mine on a good working basis.

Calaveras.

UNION COPPER.—Cor. Calaveras *Prospect*, Sept. 14: The new leaching and smelting works are nearing completion rapidly, and will be in operation in a short time. There are about 8000 tons of ore on the dumps ready for firing. Grading is about completed for the large smelting works, which, when completed, will reduce 100 tons of ore per day. The shaft which was damaged by a cave some time ago has been cleared and retimbered with 12x12 timbers; also planked with 2-inch plank, thus making a first-class job. Both shafts have been repaired in the same manner. New hoisting machinery has been erected on shaft No. 1, and Mr. Ferson has had two large safety ore skips made with all the latest improvements. It is the intention of the company to sink shaft No. 1 down to the same level as shaft No. 2, and then connect the two shafts at the 7th and 8th levels. The ore from shaft No. 1 is to be conveyed to shaft No. 2, where it will be dumped on to a large grizzly. The coarser rock will be crushed in a Dodge improved rock-breaker or crusher. Mr. Ferson found that the old Brodie rock-breaker would not do the work, and a 15-inch Dodge improved breaker was put in its place. The rock will be sorted here and the poorer quality will go to the leaching floors, and the highest grade ore to the smelter. At present the ore is conveyed from the upper ore-bins to the lower bins, where there is an 18-inch rock-breaker. The track is made of T rail placed on a strong and substantial trestlework a distance of over 2000 feet, over which horses haul large cars filled with ore. The company intend in a short time to put on a small locomotive to do the work of the horses, when about 400 tons of ore will be handled and worked per day. Over the present roasting floors are three lines of trestlework, each track being 413 feet in length. These floors are being covered up at the rate of from 150 to 175 tons per day. The grading for the leaching floors is completed. The grading for the roasting floors for smelting ore is almost completed, and from 3000 to 4000 tons of ore can be roasted at once. The plant has been so constructed that the ore will not be shoveled by hand after it is sent into the chutes in the mine. The location could not be bettered, as everything after leaving the mine goes downhill. The work is being pushed ahead as rapidly as possible under the able management of Supt. J. A. Ferson.

RICH STRIKE.—*Prospect*, Sept. 14: Bracket and Hutchinson, two prospectors, discovered a good prospect in quartz last fall near the Mokelumne river, about one mile from Mokelumne Hill. They worked it for some time and took out some money. They bonded the mine for six months to a man by the name of Reed, who ran a tunnel into a hill, and not finding anything, let the bond run out without accomplishing anything. Hutchinson and Bracket went into the Reed tunnel a few days ago, and within one foot of where Reed quit work, the owners of the mine struck a rich pocket and took out over $400 in one day, and there is plenty more in sight. They have without a doubt got a rich prospect, and their mine when developed may prove one of the best in the county. They have a fine location.

El Dorado.

BEN FRANKLIN.—Georgetown *Gazette*, Sept. 12: Col. G. W. Dent continues to deepen the shaft on the Ben Franklin, with two men at the windlass and one at the bottom. The shaft is down about 70 feet, and two hours' work every morning keeps out the water. The ledge is now 3½ feet in width, having improved both in quantity and quality. The ore is all of a good milling grade. The colonel is well pleased with his prospects for a good mine.

Inyo.

SPLENDID PROSPECTS.—*Index*, Sept. 11: About 20 years ago considerable tunneling and like prospecting work was done on the Drummer Boy mine, a location a short distance above the present site of Independence Depot. Ore transportation and other expenses were then high; the mine was abandoned and has since been untouched. Last year it was relocated by Nathan Rhine, who recently employed men to do the required assessment work. They have struck a promising body of ore, two assay returns from which assure a net return of $37 per ton. The ore averages about 40 per cent lead, and carries 40 ounces of silver with a trace of gold. The Inyo mountains have much hidden ore of high grade, some to be found through abandoned prospects and more to be uncovered by new discoveries. There are hundreds of miles of mineral territory in this county awaiting to reward the prospectors who shall give it their attention.

CERRO GORDO. — Archie Farrington, superintendent of the new Union Con. Mining Co., passed down the road on Monday. He had four expert miners with him, and informed us that present work at the mines would be much in the nature of prospecting. While the dumps and the old workings show more than enough to justify the price paid for the property, it is confidently expected that further exploration will develop new and extensive ore bodies, and result in working the mines on a large scale. So long as the labor is preliminary in character, only a limited force will be employed.

A DISCOVERY.—Last week Mr. W. C. Morton, while prospecting on the northeast side of Telescope peak, discovered several ledges of what appears to be rich silver rock. He states that there are three large natural tanks, which the elements have worn in the rocks, full of pure cold water, and that a stream carrying over 150 inches of water gushes down the canyon a few hundred feet from his discovery. Plenty of timber close at hand, and the ledges can be reached from Death valley, four or five miles east, by wagon.

WHITE HILL ORE.—Barnes & Kehoe have taken five or six tons of gold ore from their Red Top mine, and are now arranging for its shipment and working. No assays of the ore have been made, but frequent horn-spoon prospects indicate its high grade.

Monterey.

THE LOS BURROS MINE.—Salinas *Index*, Sept. 12: The Cruikshanks have sold their Last Chance mine in Los Burros to a company of San Francisco capitalists. The directors of the company are L. Gilson, president; Thos. Bell, Horace Hill, Robert Hamilton (of Baker & Hamilton) and C. W. Jackson. It is expected that the new ten-stamp mill will be ready to crush ore in about 30 days.

Nevada.

THE OLDEST WORKING MINE.—*Tidings*, Sept. 13: The oldest working mine in Grass Valley district, the Empire, is down 1850 feet and the depth is being added to at the rate of 40 feet monthly. Sinking will be continued steadily until the mine is 2000 feet in depth, when Supt. Starr declares that the ledge, now split, will be found united and as rich as in the palmiest days. Three times previously has the ledge split, and each time the main ledge has for a period thereafter been comparatively barren, while the upper and lower ledges, comparative stringers, have been rich. Such is the case at present, the stringers being worth $50 and $60 a ton but entailing too much expense for profitable extraction. Heretofore, development work not having been kept up in the prosperous days, the mine has been closed down. Even at present, it is admitted, development work is considerably behind, but with the facts mentioned above in mind, operations are steadily continued with almost a full force of men. The stringers mentioned are now obviously coming toward the main ledge, and, as stated above, the superintendent is confident of again striking it rich at the 2000 level. Further, he declares unreservedly that the Empire will be working 15 years hence, as will also the North Star. In the future, however, development work will keep pace with other operations.

WHY MINES ARE CLOSED DOWN.—"Many of our mines," said Mr. Starr in conversation lately, "have been shut down because while taking out rich rock here, development operations have been suspended in other quarters of the mine to enable the payment of good dividends. As a matter of course, the rich vein does not continue rich throughout, and then it is necessary to levy assessments to carry on deadwork that should never have ceased, and for which say $2000 set aside monthly would have been sufficient. Had this been done heretofore, the Empire, North Star, Omaha and undoubtedly a dozen other mines would never have suspended operations until the claims were worked out. That this is a fact is evident, for have not the mines named been reopened after the lapse of years, from $10,000 to $50,000 spent in developments and the mines proven profitable properties?" The Empire gives employment to 150 men—on day's pay, tribute and contracts.

A PROFITABLE MINING INVESTMENT.—A gentleman who knows whereof he speaks tells us that the Idaho mine pays a profit of $10,000 per stamp annually. When the Maryland, adjoining and into which the Idaho ledge pitches, is opened up, it will have a 60-stamp mill, and at the same ratio will pay 20 per cent on an investment of $3,000,000. The Maryland will undoubtedly prove a second Idaho.

A SIDE SCHEME.—That portion of the Empire mine known as the Rush & Laton ground has been let on tribute to James Oliver and others. There is a shaft 90 feet in depth on the ground and the tributers' lease includes the ore to a depth of 300 feet, below which the Empire Co. will conduct operations.

GOLD POINT MINE.—Grass Valley *Union*, Sept. 13: A crushing of 48 loads of quartz from the Gold Point mine has just been made at the Crown Point mill, and given a result that is quite satisfactory to the company, the yield being $20 per load of 3000 pounds. This was retorted gold from the batteries and plates, and did not include any from the sulphurets. The quartz opened in the mine looks equally as well, and other crushings equally as good are expected to follow. The ledge that is being opened up is from two to four feet in size, and the ground is favorable for working. In sinking below the tunnel level the water has been found quick, which will necessitate the use of a pump for further sinking, but the drifting and stoping on the tunnel level can be prosecuted without interruption, and the work of taking out ore will be kept up regularly.

CROWN POINT.—Grass Valley *Union*, Sept. 13: The Crown Point mine having been bonded to Jos. Bonivert, he has taken measures to incorporate a company for the development of the property, and on Tuesday evening there was a meeting of the subscribers of the stock for the purpose of organization. The name adopted for the company was the Crown Point Mining and Milling Co. Amount of capital stock, $660,000. The new company has nine months in which to complete the purchase of the mine, the price being $66,000. Some improvements are to be made in the hoisting and pumping machinery, a Pelton wheel being substituted for the large water-wheel now used. When this is done the 300-foot level of the mine, which has been flooded with water for 18 months or more, will be pumped out, and the shaft sunk for another level.

CHEROKEE MINING DISTRICT. — *Transcript*, Sept. 11: W. H. Hicks of Cherokee says the quartz-mining prospects of that part of the county continue to be very encouraging, and in his opinion a reasonable outlay of labor and capital there would result in opening up some valuable properties. The Lucky Joe is being opened up with a force of four men, and the Seneca is in a fair way to have work pushed on it again in the near future. L. D. Rathburn has brought to Locklin's mill at this city from J. G. Hall's Uncle Sam claim in the same locality two tons of fine-looking ore taken from a superficial depth. A ton taken from the same mine some time ago milled $71. The question now is as to whether the ledges of that district improve or fail as they descend.

NORTH STAR.—*Transcript*, Sept. 13: The total output of the North Star quartz mine of Grass Valley for the month of July was $21,219.44, and for August, $27,400. Nearly all the levels have contributed to this output, but the most has come from the 1800-foot level. The ore extracted during the last two weeks of August averaged $20 a ton. The 1900 level is now being opened. The company will pay a $50,000 dividend shortly.

THE SPANISH MINE.—The last load of the milling output recently purchased from C. W. Cross' mine, near Camptonville, for the Spanish mine at this city, will be brought down during the present week. The shaft at the mine is being put in fine condition and next Monday Frank Miller will commence the work of putting up the mill. The Spanish is being developed entirely by local capital, and it has every promise of proving a valuable claim.

Placer.

PICK AND SHOVEL.—Placer *Herald*, Sept. 14: The Live Oak Company is sinking a shaft on the west rim. The Mammoth Bar mine is making its owners rich. A. Shurtleff is taking out very rich rock at the St. Patrick. The Hogsback Co. expects to start the new tunnel right away. The Red Point is paying big. The Mayflower mine still rolls out big dividends. The tunnel at the Gray Eagle mine is now in about 130 feet. The rock is very favorable. Supt. J. B. Patterson has 28 men at work at the Eclipse mine sinking shafts and in other ways preparing for a systematic working of the mine. Some very rich ore has been taken out. W. Stewart and W. McGillivray are laying up a big bank account. They are working a bar in the Middle Fork, just above Horse Shoe bar, and have taken out as high as 30 ounces in a day. The crushing and amalgamating mill invented by Mr. A. C. Bowen of Michigan Bluff, and exhibited by him at the fair, is being tested by some of the miners in the vicinity of Auburn. In the north gangway in the Mayflower mine, a drift has been run 300 feet in length, through a kind of yellow quartz gravel and sand. This new channel, or whatever it is, crosses the regular channel almost at right angles, and is about 14 feet deeper. In sinking through it a layer of cement was struck some six or eight feet thick, below which was the yellow gravel again. Good prospects have been taken from it. The gold is black. Miners are puzzled about the yellow deposit. Some think it is the Orono channel and others will give no opinion.

San Benito.

QUICKSILVER.—Hollister *Free Lance*, Sept. 14: Seven hundred pounds of quicksilver are now shipped about every week from the Gypsy mine in Lone Tree.

San Diego.

DEEPER. — Julian *Sentinel*, Sept. 14: W. H. Dilks has secured the contract for sinking the shaft at the Washington mine 100 feet deeper, and a full crew of men is now making things lively in the gulch up back of town.

DISCOVERY OF GOLD.—*San Diegan:* Gold was first discovered in Pine valley, so far as known, by Mr. Wilcox of Julian, who two years ago found a 6-foot ledge, which he worked a short time and then abandoned. About a year ago John Noble of San Diego, accompanied by a man named Reece, found at the end of five months' persistent prospecting, a very rich but narrow ledge. The Eureka was thoroughly tested and shown to run $130 per ton. Its discovery was soon followed by that of another ledge, 42 inches wide, and now known as the Bay View, which showed plenty of free gold $200 to $300 per ton. Noble and his companions kept quietly at work, and other prospectors soon joined them. Noble's camp was established on a good footing, and then eight or ten rich ledges were opened a little north and resulted in the foundation of Deer Park camp. Among those interested in Deer Park camp are: Messrs. Hawkes, Seybolt, Fulton, Patrick, A. H. Julian and Dr. Rood, all from San Diego. Four miles northeast of Noble's camp, claims have been located by Messrs. O'Neil, Burke and others from San Diego. In Noble's camp Messrs. Goodbody and sons, Cherry, Hadley, Bean, Jux, Batch, Jaycox, Withrow, Clarke and son, Fisher, Ellingwood and others have claims. At head of Pine creek, near the edge of the desert, very rich rock has been found. The general formation of the country is slate, but there is plenty of granite, porphyry and native rock. There is an abundance of pure mountain water, good wood and grass. Pine creek will average 24 to 40 miners' inches the entire year, and there are other flowing streams as well. Many stamps can be run by the power furnished from Pine creek. A two-stamp mill has just been built at the Standard iron works in this city, and it is now being transported to Pine valley to be used in Noble's camp. Lumber is on the ground for a 900-foot, 12-inch flume, and likewise 190 feet of 8-inch iron pipe to conduct the water to a Knight's turbine wheel, which will run the mill. An 80-foot fall is secured. There are now fully 125 miners and prospectors in Pine valley, nearly all from San Diego, and 100 of these have gone in within the past four weeks, and it begins to look as though a mining boom was well underway. The Pine Valley Mining District has been organized with L. H. Cherry for recorder. A gold brick worth $250, the result of preliminary work, is evidence of the richness of Noble & Co.'s claim.

Shasta.

OLD DIGGINGS.—Redding *Free Press*, Sept. 14: Hart & Fleming have put two new Triumph concentrators in their mill.

Sierra.

THE BUFFALO MINE.—Cor. *Mountain Messenger*, Sept. 14: The Buffalo mine, in Hog Canyon, seems to the general public to be a failure, and it is, no doubt, to the present stockholders, as it is now lying idle. They are all poor men and have not the means to pay off the indebtedness and put in proper machinery to try by some more scientific means to save the gold. In my opinion that is all the trouble. There have been absurd reports floating around that it is not gold that the rock contains, but is some other metal. Now, I have been gold mining for 40 years and think that I ought to know gold when I see it, especially in its native state, either in quartz or gravel, and to satisfy myself or rather contradict that absurd report, we have kept some prospects in acid for 24 hours, and it had no effect on the metal. When such false reports are started, they not only affect the prosperity of one mine but the whole of that industry in the county. As I said, the owners of the Buffalo are poor men and their experience with such rock generally is limited; but of one thing I know, some of the prospects, both from the decomposed and solid quartz, would surprise the best experts in the State. There is one certainty, that the gold cannot be saved by the present milling process, for it went in the shape of amalgam, out of the batteries, over the plates and into the creek, for we have found quicksilver and amalgam half a mile below the mill. Good, experienced miners say that the Buffalo is so situated and the rock so easy to extract that it would be one of the biggest paying mines in the county if they could make it pay $3 per ton; but of course to do that they must have new arrangements to save the gold.

LOGANVILLE.—*Mountain Messenger*, Sept. 14: Work at the Marguerite mine is being pushed ahead vigorously. The music of the Knight wheels can be heard night and day at both hoisting works, which gives the place a little more life than before. The pumping engine is ready to start and the work of lowering the pump will soon be in order.

Siskiyou.

QUARTZ.—Yreka *Journal*, Sept. 18: Spencer & Co. have taken out about 100 tons of quartz from their ledge on Humbug, for which they say they would not take $30,000, and it is probable much more will be realized when it is crushed. Boyle & Co., at head of north fork of Humbug, are taking out considerable more quartz, and will soon have another lot of their $75 per ton ore ready for crushing. The scarcity of water on Hungry creek has stopped quartz mining until the rains commence, when it is expected good returns will be realized, the Fairy Queen mine having paid very rich as a sample, when water was obtainable to do any crushing. Messrs. Hutchings & Clark realized over 101 ounces from 22 tons of quartz crushed at Humbug creek last week. When the Hegler Bros. and Bruce Aldrich prospected and commenced working a quartz ledge on Humbug creek less than two years ago, there were no neighbors within several miles of them. Now the entire creek and mountains in the vicinity are full of quartz miners, all doing well, and in a short time Humbug will become one of the best mining sections on the entire coast. The work of fixing up and preparing for winter operations has been commenced by the San Jose Ditch and Mining Co. at Scott river, engaged in hydraulic mining at Whiting Hill, one of the richest claims in the county. Mr. Campbell, the energetic superintendent, has charge of the claim and ditch. Mr. Hunt, the superintendent of the Quartz mine, at Quartz Hill, Scott river, is now at the claim, with intention of making preparations for winter, in getting out quartz and starting the mill in operation.

Trinity.

THE ENTERPRISE.—Trinity *Journal*, Sept. 14: Mr. Chas. Lobdell, one of the owners of the Enterprise mine, informs us that the mill recently constructed on that mine in East Fork is completed and in fine running order. The mill began crushing rock from the Enterprise this week, using five stamps. The company has 150 tons of Enterprise rock on the dump which will be crushed first. Next month they will crush ore from the Lone Jack, of which they now have out over 100 tons. They could have had more rock from this ledge, but lacked facilities for dump. An ore chute will be constructed to run ore from the Lone Jack, the coarser ore running to the rock-breaker. The arrangements are such that the ore will not have to be handled at the mill at all. The company is working 21 men, and the future of the mine looks very bright. Mr. Lobdell is also interested with Mr. J. R. Flagg in several locations on Rich gulch, on which considerable work has been and is now being done. The prospects are very flattering.

CANYON CREEK QUARTZ.—From Supervisor Flowers we learn that the quartz prospects above Canyon City are looking very favorable. Bailey & Flowers have three ledges situated on the ridge between Canyon creek and Steuart's fork, about 5½ miles above Canyon City. The largest ledge is seven feet in width; the other two are five feet and six feet respectively. Each ledge carries free gold and sulphurets and prospects well. The upper ledge is decomposed on the surface for a distance of three feet from the hanging-wall and about as much solid quartz adheres to the footwall. The formation is porphyry. They are running a tunnel to tap the middle ledge; they are now in 30 feet and expect to tap the ledge this week. This tunnel will tap the upper ledge at a depth of 100 feet. From the dip of the upper and lower ledges it is probable that the three ledges will ultimately run together, forming one large ledge. Dedrick & Jones have seven locations. Mr. Jones is now at work on them. Grigsby has several locations which prospect well enough to justify him in putting up an arastra, which he will do right away. He has made a trail and procured the necessary lumber. All indications point to a good quartz country around Canyon creek. The camp in early days was rich in heavy gold, and the characteristics of the neighborhood are such as indicate the presence of gold-bearing quartz. The discovery of the present ledges will stimulate further prospecting and development, and we confidently

expect to see the lively times of early days reproduced in Canyon City and another quartz camp adding to the material progress of the county.

Tuolumne.

STARTED UP.—Tuolumne *Independent*, Sept. 14: The Rising Sun mine has been started up again, and is under the efficient superintendency of Mr. J. H. Neale, who has also placed the Santa Maria mine in operation. Mr. Neale informs us that he expects to have the Spring Gulch mine in operation in the near future.

THE TEN-STAMP MILL on the Mary Ellen mine, near Groveland, is now completed, and five stamps were started last week on good rock. The mill works splendidly, and the mine is expected to keep it supplied with first-class ore.

SPECIMEN.—We were shown a fine specimen this week by Charley Smith. It was a gold specimen in the form of a small brick, weighing 6¾ ounces, and valued at $126.66. The gold came from Charley's mine on Brown's Flat.

THE DEAD HORSE MINE, at Summersville, closed down last Saturday on account of no water.

NEVADA.

Washoe District.

SCORPION.—*Enterprise*, Sept. 14: On the 520 level, at a point 15 feet back from the face of the main drift, a south drift has been started, and has been advanced a distance of 45 feet in soft porphyry.

HALE & NORCROSS.—On the 500 level the upraise from east crosscut continues in good ore. Have temporarily discontinued work at this point until ore shipments are resumed to the mill, as our ore-house is about full. From the north drift on this level, at a point 260 feet south of our north boundary, have started an east crosscut No. 2.

SAVAGE.—On the 500 level are extracting ore of a good quality from the north drift from the west drift in the upraise. In No. 2 west drift the upraise was extended seven feet and continues in fair-grade ore. On the several levels and in the shaft men are engaged in making repairs, in easing timbers and in prospecting.

CROWN POINT.—The 800 south drift was advanced 23 feet and the face is in porphyry, showing stringers of quartz. The 800 west crosscut is out 120 feet, and the face is in porphyry and quartz, with a little water running from it. The ground at this point presents a very favorable appearance.

GOULD & CURRY.—The north drift from west crosscut No. 2, on the 300 level, is still being advanced in a mixture of porphyry and clay. No. 1 west crosscut on the 400 level is in a formation consisting principally of porphyry.

BELCHER.—The raise from the 1200 level has connected with the 1100. It was in low-grade ore during the upper half of its course. On the 200 level, the face of the east crosscut is in low-grade quartz and clay.

EAST SIERRA NEVADA.—On the 520 level, at a point 15 feet back from the face of the main drift, have started a south drift and advanced it 45 feet in porphyry. Some water is coming in at the face of the drift.

BEST AND BELCHER.—The northwest drift on the 550 level continues in vein material of a promising character. A considerable amount of work in the way of making repairs is being done on the 1000 level.

OCCIDENTAL.—Are extracting weekly between 400 and 500 tons of ore averaging a little over $18 a ton. This ore is coming from the 350, 400 and 450 levels. The concentrating apparatus is doing good work.

SEG. BELCHER.—The usual work is in progress on the 100 and 1100 levels. The circulation of air on the latter is excellent since the connection was made between the south drift and the south crosscut.

OVERMAN.—A considerable amount of prospecting is in progress in various places in the mine. Some repairs are also being made. The general appearance of the mine is promising.

CONFIDENCE.—The joint Confidence, Challenge and Imperial north drift on the 500 level is now in 880 feet from the Yellow Jacket shaft; the face shows quartz and porphyry.

UNION CON.—No. 2 crosscut west from the north lateral drift on the 1465 level is still in vein porphyry containing streaks of clay, from which there is a small flow of water.

OPHIR.—The east crosscut from the shaft station on the 1300 level to connect with the raise from the 1465 level is making good progress. The face continues in porphyry.

SIERRA NEVADA.—Good headway is making in the south drift from the main east drift on the 520 level. Some water is coming in at the face of the drift.

EXCHEQUER.—The principal work is on the 382 and 500 levels. The west crosscut on the 500 level is being advanced in quartz that is showing some metal.

ANDES.—Prospecting is active both above and below the 350 level. Some ore of low grade is being obtained from the raise above that level.

JUSTICE.—The ore-producing sections of the mine continue to yield well and the average of the battery samples as good as any on the lode.

WARD COMBINATION SHAFT.—The shaft is repairing to the 1700 level. All is being brought into good working shape as rapidly as possible.

BALTIMORE.—Are prospecting to the westward on the 225 level. A considerable amount of ore is still showing on the 300 level.

MEXICAN.—The drift north from west crosscut No. 1 is in a mixture of quartz and porphyry of a favorable appearance.

NEW YORK.—The raise from the west crosscut, 800 level, is up on the slope 81 feet, and the roof giving fair assays.

ALPHA.—Prospecting on the 382 and 500 levels. On the former some low-grade ore has been encountered.

CHOLLAR.—The north lateral drift, 750 level, is out 58 feet; face in quartz and porphyry giving low assays.

SILVER HILL.—A good deal of prospecting is in progress. This is principally on the 160 and 200 levels.

POTOSI.—Work is being done on the 150 and 850 levels. No change of formation since last week.

UTAH.—No. 1 west crosscut continues in vein material in which clay and quartz predominate.

CON. CAL. & VA.—Ore is being extracted from the stopes of all the levels from the 1400 down to 1950 level. A good deal of work, both in the way of extracting ore and prospecting, is being done on the 1650 level. The ore body found at the bottom of the winze below the 1950 level continues to yield well, both north and south, also upward.

NORTH OCCIDENTAL.—Ore of good quality is being extracted from the stopes on the 400 level.

CON. IMPERIAL.—The north drift on the 300 level is still in quartz that carries some metal.

YELLOW JACKET.—Are still shipping an average of 50 tons of ore daily to the Brunswick mill.

ALTA.—The ore that is being worked comes from the 925 level. It is of good quality.

Morey District.

SHIPPING ORE.—Belmont *Courier*, Sept. 14: Henry Metz informs us that the Magnolia mine continues to look tiptop. The lessees are shipping from 80 to 100 tons of first-grade ore per month to Salt Lake City, for reduction. Supt. Cohen and a party of capitalists were expected to arrive at Morey from the East on Wednesday last.

Osceola District.

DITCH.—White Pine *News*, Sept. 14: There are now 200 men at work on the new water ditch being brought into Osceola, and the old camp is said to be assuming a lively air.

Tuscarora District.

BELLE ISLE.—*Times-Review*, Sept 14: North drift, 250-foot level, extended 17 feet. The face shows spar and iron with low-grade ore.

DEL MONTE.—North drift, 225 foot level, extended 13 feet; the face looking very well. Joint crosscut, same level, extended 16 feet in vein matter with low-grade ore. North drift, 100 foot level, extended 8 feet; the whole face is in ore, some of it high-grade.

NORTH BELLE ISLE.—The shaft has been sunk and timbered 16 feet. Have no trouble in handling water. The concentrator has been started on the low-grade ore already extracted. Everything running nicely.

NAVAJO.—The crosscut from the south drift, 350-foot level, extended 18 feet. Upraise at the south end, same level, extended 11 feet; total 118 feet. The vein, though small, continues to carry high-grade ore.

COMMONWEALTH.—100-foot level: No. 14 north drift, from No. 13 west crosscut, has been extended 16 feet; total length 156 feet; face still in vein matter showing high-grade ore in top of drift.

NORTH COMMONWEALTH.—Joint crosscut, 225-foot level, extended 16 feet in vein matter and low-grade ore. Main south drift, 100-foot level, extended 13 feet.

GRAND PRIZE.—Water lowered 16 feet during the past week. Everything at mine and concentrator running smoothly.

ARIZONA.

CHLORIDE NOTES.—Mohave *Miner*, Sept. 14: Wm. Brakeman is chloriding on the Independence. Roger Bros. and Canas are getting lots of good ore in the Tintic. Harry Ewing and Joe Prisk are getting good ore at 90 feet in the Tuckaho. Jack O'Brien and Jim Dougherty are still at the Schuylkill, turning out carloads of lead ore. Geo. Darden and Henry Strawbell are getting good gold ore from their claim, situated near Painted Rock spring. Tommy Stinson is located near the top of Surrum's peak, at what was once known as the Penberthy mine. Tom is getting high-grade ore. Dan McKinnon is piling up quite a lot of good ore at the Altata. Steve Smith is moving up on the west slope of Surrum's peak, where he will establish a camp and commence developing a promising claim which he located last spring. Juan Garcia and Martin Jiminez are preparing to do lots of work on the Gold Back. They have been busy the past few days packing timber, tools, supplies, etc., for sinking an additional 100 feet. Their ore is gold and silver. A. M. MacDuffee is still working on the Rustler with good results, and is getting out some very high-grade ore, way up in the thousands. This is an old claim that has lain idle for years.

BRADSHAW DISTRICT.—Prescott *Courier*, Sept. 16: The Petrie mine, Bradshaw district, owned by Geo. W. Sines and L. Elliott, is said to be rich in gold and silver. A tunnel that will prospect the vein deep down is being run. Frank McCabe, owner of a couple of mines in Big Bug district, between the first of March and July of this year, secured gold worth $1700 out of his Sink to Rise mine. This amount was taken in one arastra. He also, in same time, shipped several tons of rich ore. Two miners worked for him.

CONGRESS.—Between 20,000 and 30,000 pounds of sulphuret ore from the Congress were brought in yesterday for shipment. The Silver King mine, Groom Creek district, is at present very much talked about. At a depth of 80 feet the vein is strong and very rich in both gold and silver.

COLORADO.

ASPEN.—Cor. Denver *Tribune*, Sept. 14: There has never been a time in the history of Aspen when the mining outlook presented so many promising features. This has the reputation of being what is called a "winter camp," that is, a camp in which the greatest activity is during the winter months, and in which the leading discoveries are made during that season. Both north and south of Aspen important developments are taking place. In Hunter park, to the north, the richest ore yet brought from that section was recently taken from the Myra. It is not yet found in quantity, but there is a splendid prospect that a pay mine will shortly be opened at that point. The Mineral Farm, on the north side of Smuggler mountain, is at last opening into pay. The Bushwhacker, also on Smuggler mountain, has struck some ore and gives promise of becoming a pay mine. The Smuggler Co. has entered upon an extensive plan of development of that famous property. The main level is being driven northward, and is coming into ore that is of better grade than the great chute near the shaft. The Mollie Gibson is looking better every day. A rich chute was recently opened at a point midway between the first and second levels. While this is an important matter, other features of the development are more so. The grade of the general ore body is improving. On Aspen mountain the old mines are all improving, and some new properties are opening up. Several of the leases that have made such a great record during the season are just expiring, notably the Edison and Celeste, and such properties will not be active producers again until the owners have had time to straighten them up and open new ground. The Carlisle, a Tourtelotte park fraction, has opened up a six-foot body of ore that runs from 30 to 60 ounces silver per ton. The Julia and Mackey, another Tourtelotte property that struck ore some two weeks ago, looks well. Further south on Richmond hill ore has been found in the Little Annie during the week that runs as high as 5700 ounces. It is found in connection with an exceptionally large body of spar. Those familiar with the Aspen formation know that this indicates a probability of a body of rich ore in the vicinity. In the immediate vicinity of Aspen the mines are making a remarkable record. The Compromise is increasing its shipments. It is also rapidly building its tramway, which will enable it to run its output up to 300 tons per day. During August the average daily production was 175 tons. The Aspen mine eclipsed its record during August, and the dividend for that month is estimated at $150,000.

DAKOTA.

THE LIDA GROUP.—Deadwood *Pioneer*, Sept. 14: Thos. S. Bentley came in Thursday evening from Elk Creek, where he is developing the Lida group of mines owned by himself and Harry Smith of this city. A tunnel recently commenced has now been driven 20 feet. Its whole face is in free-milling ore of better than average grade. A mill test of 62 tons of ore taken from other openings on the property gave returns of $7.62 per ton. The new strike is thought to be of even better quality. It develops, as the *Pioneer* stated on chronicling Mr. Miller's departure, that his trip to Chicago is to purchase machinery for a plant to do dry smelting. The plant will go up here this fall. C. H. Kingman and others of Chicago are interested. From what can be ascertained at this end of the line, machinery will be here within a very little while. The establishment of such works will produce a very healthy and much-needed revival of activity in mining circles, by which better times than the city has known in years will be created.

IDAHO.

SAMPLE.—Ketchum *Keystone*, Sept. 14: Milt Mourning shipped 21½ tons of ore from the Idaho mine at Boyle mountain and has been busy during the week having it sampled. The first-class ore yielded 140 ounces silver, 70 per cent lead and $3 gold per ton. The second-class ore went 53 ounces silver, $7.56 gold and 46 per cent lead per ton. Deering, Montgomery and Collins shipped a lot of concentrates from the Allen group of mines on Warm Springs creek during the week, which sampled 94 ounces silver and 45½ per cent lead. John Anderson and Wm. Goring have taken a lease on the Rob Roy mine. This mine is a relocation of what was once the Back Pay, and is situated about two and a half miles east of Ketchum.

SAWTOOTH.—The Vienna M. Co. have several men at work exploring and upraising from the lower works of the Vienna. The Silver King mine has been closed down for the winter. S. H. Hays has a lease on the Pilgrim mine at Sawtooth and is working three men. Two men are running a drift on the vein in the main tunnel of the Justice mine at Sawtooth, owned by Ole Opeland and others. They have found some very good ore. John Lynch is still working the Eagle mine, which is situated about a mile above the Pilgrim. With continued work the mine is making a very good showing. Although none of the large companies, excepting the Vienna, who own mines in the Sawtooth district, are working their properties, still there is considerable work being done on many different mines in the district by individual owners and lessees.

TEST.—Idaho *Avalanche*, Sept. 14: The Nellie Stoddard mine is now being opened under the immediate supervision of Mr. Shuman and is showing good ore, about 25 tons of which are now being put through the Oro Fino mill as a test.

GOLD.—On Thursday, Mr. Morkill, superintendent of the Poorman group of mines, came down from the Oso with a handful of ore just taken from the face of the drift with gold in it as large as grains of wheat. He informed us that the workmen had passed the porphyry dyke to where this heavy gold was found. The lode is two feet wide and prospects wonderfully in gold.

MONTANA.

HOPE.—Phillipsburg *Mail*, Sept. 12: Everything is in readiness now for the starting up again of the Hope mill. Many of the old employes have resumed their stations. John Adams will assume the foremanship of the mill. The ore in the Hope mines has been getting richer and more extensive of late, and it is claimed by those who ought to know that the large body they have recently struck is richer than anything ever before discovered in the mine. In the Porter lode, winze No. 2, the ore body is rich, and assays 100 ounces per ton, silver. The drift south is about completed, and all work now being done is entirely satisfactory.

GRANITE MOUNTAIN.—The output for the week ending September 12th was 49 bars of bullion, containing 71,500.25 ounces fine silver and 145.953 ounces fine gold.

DRUMLUMMON.—The following is the output of the Drumlummon mine for the month of August, 1889: Fifty-stamp mill crushed 3270 tons, yielding $69,600; 10-stamp mill crushed 500 tons, yielding $19,500; 60-stamp mill crushed 2900 tons, yielding $21,100; total, $110,200; working expenses, $55,000.

A RAILROAD TO THE MINES.—Anaconda *Review*, Sept. 14: From a gentleman who visited Oro Fino, Tuesday, we learn that the Union Pacific surveyors are still operating in that district. They are trying all of the different ways of getting out of the camp into the valley in order to determine upon the best grade, and at the same time make the proposed line easy of access for the various properties in operation or course of development. The demand for a railroad to Oro Fino increases with every property developed, and it is only a question of time when one will be built.

BUTTE NOTES. — *Inter-Mountain*, Sept. 14: Moulton is working 20 or 30 men developing the property all through the mine. The mill stands idle, owing to the shortage of water. If water sufficient were on hand the mill would start up immediately, as the ore-bins are full to overflowing with very near as much in the chutes as in the mine. The Alice's 60-stamp mill is running at its full capacity on ore taken exclusively from the mines of the company. The Clark's Fraction is working about 15 men, producing some very fine ore from the mine. The ore of the best quality is reduced at the smelter of the Butte Reduction Works and the Colorado smelter. The Eagle is taking out some very fine ore, the low-grade going from 40 to 60 ounces, while the better quality goes about 150 ounces. The Black Rock, east of the Elm Orlu, is shipping considerable ore and giving employment to about 25 miners on a shift. The shaft is 250 feet, and a sufficient quantity of ore is in sight to run for some time to come.

AT ARGENTA.—*Inter-Mountain*, Sept. 14: The Tuscarora smelter is being run regularly on ore from the late Scott mines. Mr. Scott is operating the smelter on a lease, and as he has immense reserves of ore in sight, the Tuscarora smelter will no doubt run continually during the term of his engagement. The P. J. Kelly Placer and Quartz Mining and Reduction Co. will have their smelter completed by the first of the month.

AT DEWEY'S FLAT.—The company that purchased the Lone Pine, the Partridge Bros.' property, are now busily engaged in erecting a mill to reduce the ore. The contracts were let during the past week for the building of a branch road from a point on the Butte & Gallatin railroad to Pony and Red Bluff. This will open up a mining region that has been languishing for years for the want of railroad transportation. When the road is completed it will make a showing for itself. Ore that was shipped out of there had to pay wagon freight for 40 miles over a rough country, and a large saving will be made in this one item.

NEW MEXICO.

LONE MOUNTAIN.—*Northwest Sentinel*, Sept. 14: A few leasers have made money, as a rule, by shipping ore to Socorro, El Paso and other points. The average cost of shipping and treating the past year has been $32.50. Ore can be milled here at less than half the smelter charges, and the freight by team and railroad will be saved to the miner, and Silver City will, in a great measure, reap the benefits. The miners are now all working on good ore. Bisby & O'Neil have just encountered a fine body of high-grade ore in the Monarch. The ledge is 18 inches and will average 200 ounces. Ealsch & McCarty are now taking out 250-ounce ore at a depth of 40 feet on the Home Ticket. Fifteen tons taken out of this shaft before the present leasers took hold of it yielded 150 ounces to the ton.

PINOS ALTOS.—Silver City *Enterprise*, Sept. 14: The vein system on the west side of Whisky creek consists of a series of parallels, and the developments thus far indicate that with depth, these will converge and form into one vein. The Minnesota crosscut tunnel furnishes an illustration of this. The tunnel is 200 feet in length, and it is expected that the main vein will be tapped during the week. The owner, Mr. Harry Fowler, will develop it for all its worth. Assays and mill runs show the ore to be worth $40 per ton. The crevice is wide, easily worked, and taken as a whole the Minnesota is one of the best propositions in the district.

COAL.—The Mexican Coal Co. of Socorro county, N. M., has disposed of its coal-fields, situated 15 miles from the Gem City, for the sum of $10,000 in cash and a certain amount of unassessable stock. Julius Wellghausen of Central has been having some ore treated from his Gulch mine. The concentrates are worth $100 per ton. D. B. Lewis has sold a one-half interest in the Grand Tower group at Gold Hill, to J. P. Forbes of Ohio, the consideration named in the deeds being $15,000. The property is now owned by Mr. Forbes and George H. Utter of this city. Arrangements have been made with M. W. Bremen to treat the ore in this city. Teams will soon be at work hauling the ore to the mill. Nothing less than 40-ounce ore will be hauled in.

UTAH.

PARK NOTES.—Salt Lake *Tribune*, Sept. 16: The Crescent tramway engine is again laid up for repairs, the crank shaft having broken this week, and nothing can be done until one is received from the factory in Ohio, which will probably be a week or ten days. Everything is looking very favorable at the Woodside and considerable work is being done. A few days ago, while sinking in the shaft, a fine boulder of ore was struck which assayed very high. Nothing is being done at the Anchor shaft, and the chances are that another new hole will have to be started from the top. At the Anchor tunnel they have recently gone through a nice body of ore, but what the extent of it is cannot be positively ascertained.

COMSTOCK IMPROVEMENTS.—A large force of carpenters is at work at the Comstock putting up new buildings and making things comfortable for winter's work. A crosscut is being run in the tunnel which has a very promising look, and another good strike is expected to be made every day. Mr. Dusseldorf, the manager, left for Europe Saturday morning to consult with the directors as to the advisability of putting in heavy machinery so as to develop the property more advantageously.

TO WORK THE GLENCOE.—Col. Shaughnessy was in town the early part of the week and concluded arrangements to work the Glencoe. A contract has been let to drive a tunnel 400 feet through the Fourth of July and other adjoining claims, which will tap the Glencoe 250 feet deeper than the present workings. As soon as the necessary arrangements can be made, which will be in a few days, a force of men will be put at work on the Glencoe stoping and taking out ore, of which there is a large quantity in sight. The work will be under the immediate supervision of Wm. M. Curtis.

OPERATIONS BY LEASERS.—Park *Record*, Sept. 14: Messrs. Thompson, O'Connell, White and McDonald have obtained an extension of six months on their year's lease on the Nevada-Northland property. The Park City M. Co. has leased its property to T. W. Thackwell and associates, who have already commenced developments. This is a promising property just east of the Woodside. The Wasatch is improving with each day's developments, and the ore chute is looking better than ever. Things are being got in shape for the winter and there will be no interruption to operations on account of the weather. Considerable ore has been taken out, which the leasers will send to market as soon as practicable.

MECHANICAL PROGRESS.

Mechanical Agriculture.

Agricultural implement makers are no mean customers of the iron and steel trades, and as the quantity of material which they absorb increases year by year, it may be of interest to briefly consider the rapid growth and development which their industry has shown. Of the quantity of iron and steel which goes into consumption annually by means of this agency, says a cotemporary, it is of course impossible to form even an approximate idea, but that it must be something considerable will be clear to any one who gives a moment's thought to the matter. Extensive works, the capacity of which is largely, if not entirely, devoted to this line, are numerously distributed over the country, while in every agricultural district there are minor establishments, the number of which is legion, dependent on this trade for their *raison d'etre*.

Those who visit our various State and county exhibitions, or who look over the advertising pages of our mechanical and agricultural papers, cannot fail to have been impressed, not only with the multiform ways in which mechanical art is now placed at the service of agriculture, but also with the rapidity of the progress made.

Especially if such an individual could carry his recollection back over 50 years, and compare the exhibitions of those days with those of the present time, he would be able to form some conception of the immense development which has taken place in this line during the past half century. From first to last there is scarcely an operation in agriculture but what is now performed or assisted by mechanical means, and while at the outstart of what we may call the actively inventive period, horse-power was the motor principally taken into account, that has now come to be frequently regarded as out of date, and has been extensively superseded by steam-propelled machines, while electricity in its turn bids fair at the present day to supplant steam for various operations.

During this progress our present degree of perfection has only been reached by gradual development and through many mistakes; but it is by means of mistakes success is attained, if only the mistakes be recognized and corrected; but, nevertheless, it would be well for our agricultural implement manufacturers to keep constantly before their eyes the paramount necessity for the nearest possible approach to simplicity. Complication means extra expense in every way, and additional danger of mishaps. We are, therefore, pleased to think that makers are now aiming at simplicity in their products more than has been the case in times gone by.

It must not be supposed, however, that although the successful application of steam to agriculture is of comparatively late date, the idea is a very modern one. A recent writer on the subject in *Bell's Weekly Messenger* states that as early as 1618 a patent was granted to two individuals in England for plowing land by steam. We should very much like to have some particulars as to this invention, which must have been a curiosity in its way. Steam plowing, although introduced to a limited extent in this country many years ago, has never come very extensively into vogue. Great improvements, however, have been made in plows driven by horse-power. It is perhaps, however, in the direction of mowing machines that the greatest inventiveness has been displayed, and the regularity and precision with which some of these do their work is really matter for wonder. In this direction California has done her full share, and in the complete harvester has given to the world the most useful, original and complete agricultural implement which has ever been introduced by any State or country. Viewed from the poetical side, there can be no comparison between the aspect of a harvest-field under the hands of reapers, gleaners and binders, and one which is being cut by means of an ungainly and noisy mowing machine, but in point of utility there can be no question as to which is the more profitable, and in these days the world is governed pretty much altogether by dollars and cents.

To go through a list of the various mechanical appliances now devoted to agriculture would be beside our purpose. Enough has been said, we hope, to suggest to the dullest mind the importance of cultivating an industry which has developed so rapidly in the past, and carries so much promise for the future, for, of course, our agricultural implement makers have, practically, the world for their market. It behooves the latter, on their part, while not allowing enterprise and invention to grow slack, to study to accomplish a given end by the simplest means possible. If this is kept well in view, cheapness and economy will be promoted, and the use of mechanical aids will assuredly extend yet further than it has done, for the benefit alike of the farmer, the implement-maker, and the iron and steel manufacturer.

RIVETING BY ELECTRICITY. — A Canadian paper gives an account of some welding done recently at an electrical exhibition at St. John, N. B. The account states that two pieces of boiler plate were effectually riveted by the electric process. The cold rivets were put through the plates and their ends held by clamps of the weld, which are so formed that they act as a die to form the rivet heads. The rivets were then heated, and when the right temperature was reached the clamps were pressed together, which upsets the ends of the rivets and formed a perfect head. Eight or ten of these, or even more, may be done at a time. It is said that work done by this method is so perfect that no calking whatever is required.

THE SAND-CORE PROCESS.—This is a peculiar and original process, and may be thus briefly described: When it is desired to apply it to steel manufacture, a case or box of sheet iron is made of the size desired. This is filled with finely powdered silica or fine sand, and placed in a mold a few inches from the bottom, so that the melted metal will run under and around its sides to the desired thickness. The metal is poured in and the work continued until the box containing the silica is covered on the top as well as on the bottom and sides, so that when the process is completed it contains within it the box of silica. The ingot is now ready to be manipulated as if it were solid steel, and can be rolled or drawn to a rod of less than one inch in diameter, or hammered into flat plates, or any other form desired. No matter how finely drawn or flattened, the sand core will be found in the center with the steel cover evenly distributed over it. The sand core, it is found, has the property of expanding and contracting equally with the metal covering it, so that when the article made from it is completed it is found to be so compact and solid as to give additional strength and rigidity to the article in which it is situated; this property makes it especially valuable when used for pillar supports or beams in building, for, in cases of fire, the core, being a non-conductor of heat, would prevent the column or beam from getting hot enough to impair its usefulness and safety. By this process, by varying the method of making the core so that it can be withdrawn, tubing of superior quality and strength can be made; even common gun-barrels, etc.— *Iron and Steel Trades Journal.*

PERPLEXING THE NATIONS.—Writing of the American section of the Paris Exposition, an intelligent observer notes that among the miscellaneous objects of interest from the United States are: Some very ingenious check tills or cash registers; oil stoves for quick cooking and boiling; the phonograph, telephones, and other electrical appliances from Edison and a half dozen first-class firms; the caligraph and other typewriters; telegraph and other wires and cables. But in every way, he adds, the most astonishing, popularly pleasing, and artistically perfect of American manufactures are those in plate and jewelry. What would have been thought half a century ago of the prophet who predicted not only that before 1890 there would be a new Birmingham in Alabama, alarming Pittsburg, and that the States would beat Britain in their annual output of iron and steel, but also that Republican simplicity would make New York the greatest diamond mart in the world, and develop the manufacture of plate and bijouterie beyond the wildest dreams of covetousness? Yet such is the fact. The world's exhibition of 1889 sees its most magnificent and expensive jewelry on view from New York, as well as a show of American silver-plate which fairly beats France on her own ground, and England, also, in true artistic merit, as at least two, if not all three, of the chief American exhibitors do any European firm in annual consumption of silver. Never was a more striking example of the truth of the old saying, "Nothing is certain except the unforeseen." There is a tribute in all this, however, reluctantly paid.—*American Artisan.*

COMPARATIVE STRENGTH OF STEEL AND IRON. The substitution for bolts, nuts, bars, plates, etc., of a tough, soft, manganese steel, in place of iron, was some time since proposed. Recently tests of a severe and decisive character have been made, with a view to ascertain whether bolts of such material are really strong and reliable as against the very heavy stresses and strains to which they are sometimes subject, and to determine whether the steel of which they are made would withstand bending, hammering close, and rough treatment in various ways, or whether such steel would only withstand heavy stresses slowly applied. Under these trials the metal is found to exhibit a toughness unsurpassed by any other, being easily nicked and bent round away from or close up at the nick. Bolts up to five-eighths inch were tested by holding the nut fast in a vise, and then hammering the bolt until it was bent downward at the screwed part through an angle of 130°, then taken out and doubled down and closed up with a heavy hammer on an anvil; but, though the screw threads were thus jammed up and compressed upon each other on the inside of the bend, and opened out to double their pitch on the outside, the steel did not break.

DYNAMITE GUNS.—The manufacture of dynamite guns is a new industry which has recently been introduced at Trenton, N. J. Six of these guns are now being constructed by the New Jersey Steel & Iron Co. The guns are to be 11 inches in diameter, and will be made in three sections. They will be constructed of cast-steel plates, bolted securely together. The guns are to be completed by Jan. 1st next.

AN ANCIENT AQUEDUCT, unruined and fit for present use, has been discovered close to Athens. It is in the suburb toward Hymettus.

SCIENTIFIC PROGRESS.

Science from the Eiffel Tower.

Eiffel Tower Meteorology.

Scientists seem to be making good use of the Eiffel tower in their experiments and observations.

At the summit of the Eiffel tower, says the *Scientific American*, there is installed a series of transmitting meteorographic instruments actuated by the variations in barometric pressure, by variations of temperature, direction and force of the wind, and other influences, and these instruments are connected electrically by means of subterranean conductors from the base of the tower to the Gallerie des Instruments de Precision in the Palais des Arts Liberaux. Here within the same glass may be seen in actual operation the records being made of the baro and thermo meteorograph and of the variations in the strength and direction of the wind transmitted electrically from a horizontal distance of a quarter of a mile and from a hight above the ground of close upon a thousand feet; and no better inducement to the public to make the ascent could be given, says "Engineering," than is supplied by the readings of the various records showing in torrid and airless galleries of the exhibition how very different are the meteorological conditions "upstairs." An interesting illustration of the perpetual freshness and strength of the wind at the top of the tower has been presented during the last week by the gradual destruction of the great flag of the French Republic, which has been waving over the gay city during the past six weeks. A few days ago the red band disappeared altogether, leaving the blue and white of another nationality to keep guard over the tower, and this week another band has disappeared, and the tower is at present surmounted by a red flag, to which are attached two streamers, the sole remnants of its former upper and lower edges.

The Eiffel Tower and the Spectroscope.

The Eiffel tower may be said to have commenced its expected career of usefulness as an aid to scientific investigation in a sufficiently startling manner. According to the Paris correspondent of the *Daily News*, M. Janssen of the Academy of Sciences claims to have made a discovery which upsets the entire theory based on the analysis of celestial bodies by means of the spectroscope. On a recent Sunday the electric lamps of the Eiffel tower were turned on the Meudon Observatory, which is 7800 meters (4 miles 7 furlongs) away. He reckons that the mass of air lying in a given section of that length at the hight of the tower is equal to the atmospheric mass above. M. Janssen argues from this that the number of molecules of air encountered by a beam of light sent from the Eiffel tower to the observatory is about the same as that met by sunlight on its way to the earth when the sun is near the zenith. He then shows that, if the analogy holds true, the belief that the sun contains oxygen is unfounded, and that if its spectrum contains the characteristic oxygen rays, this is due to the oxygen of our atmosphere. One of the fundamental theorems of spectrum analysis is that the width of the characteristic bands of a gas is proportionate to the number of molecules that intercept the light. Now, in the recent experiment the most important rays of the oxygen group were precisely similar to those of the solar spectrum. The conclusion M. Janssen draws is that there is no oxygen in the sun.

THE IRON AGE IN NORWAY.—A very interesting discovery, referring to the iron age, has been made at Gloppen, on the coast of Norway. A burial chamber, 12 feet in length, and formed of stone slabs, has been uncovered, containing the remains of a man. The find in the chamber also includes a bucket, ornamented with bronze, made of lime wood (*Taxus pacata*), two lanceheads of iron, 12 inches long, a double-edged sword in scabbard, with ferrule of bronze, and iron shield, a bronze buckle, some Roman gold coins, perforated and worn as ornaments, a glass beaker, green and blue in color, and ornamented with etched tracings, a pair of bronze scales, some iron arrowheads, and a pair of shears in a wooden case. On the body lay two large red stones and some bronze ornaments, having, no doubt, formed part of a belt, while some bear's hair and claws seem to indicate that the body rested upon a bearskin. The most remarkable part of the find is, however, that the lining of the coat around the neck was in a perfect state of preservation, and revealed rich embroidery of images of animals, an object of unique value, and that in the hands had been placed three interlaced wooden rings, resembling the well-known puzzle rings, an object never before discovered in ancient graves, and which has given Norwegian archæologists much food for speculation.

RAINFALL.—It is estimated that there are over 1,250,000 square miles in which the annual rainfall averages less than ten inches; that is to say, fully one-third of the area of the United States is deficient in moisture for the ordinary cereal crops or trees. An average of five feet of water is estimated to fall annually over the whole earth, and, assuming that condensation takes place at an average hight of 3000 feet, scientists conclude that the force of evaporation to supply such rainfall must equal the lifting of 322,000,000 pounds of water 3000 feet in every minute, or about 3,000,000,000,000-horse power constantly exerted. Of this prodigious amount of energy thus created, a very small proportion is transferred to the sea, and a still smaller fraction is utilized by man; the remainder is dissipated in space.

The Speed of Fishes.

The speed of fishes is almost an unknown quantity, being, as Prof. G. Brown Goode of the U. S. Fish Commission says, very difficult to measure. "If you could get a fish," said Prof. Goode to a Washington *Post* reporter, "and put him in a trough 1000 feet long and start him at one end and make him swim to the other without stopping, the information could be easily obtained, but fish are unintelligent and they won't do this. Estimates of the speed of fish consequently are only approximated, and more or less founded on guessing. You can tell, however, at a glance whether a fish is built for speed or not. A fast fish looks trim and pointed, like a yacht. Its head is conical-shaped, and its fins fit down close to its body, like a knife-blade into its handle. Fish with large heads, bigger than their bodies, and with short, stubby fins, are, of course, built for slow motion.

"The predatory fish, those which live on prey, are the fastest swimmers. The food fishes are generally among the slowest and are consequently easily captured. The loss is recompensed, however, by the natural law, which makes them very prolific in reproduction. Dolphins have been known to swim around an ocean steamer, and it is quite safe to say that their speed is 20 miles an hour, but it may be twice as much. The bonito is a fast-swimming fish. Just what its speed is I do not know. The head of the goose fish is very large—20 times as big as its body. It moves about very little, and swims at the bottom of the ocean. The Spanish mackerel is one of the fastest of the food fishes. Its body is cone-shaped and as smooth as burnished metal. Its speed is matchless as the dolphin, and in motion it cuts the water like a yacht."

A SEARCHING RAY.—As illustrating the far-reaching power of the electric arc, with suitable optical treatment, the fact is stated that the direct beams of the Tino light, which is near Spezia, have been observed at different times from the hill S. Giorgio, behind Savana, this being at an elevation of some 2700 feet and a distance of not less than 73 statute miles, the atmosphere being clear and the moonlight prevailing. The beams of the arc appeared very considerably brighter than those of the lantern light at Genoa, which is only one-third of the distance. In addition to these interesting facts, frequent observations are reported of the Macquaire light in New South Wales, at ranges of 60 to 70 miles, by means of reflections on the sky, while the light itself is below the horizon.

COMPRESSED AIR and electricity it would seem are to be the rival motive-powers of the future. It is stated that compressed air has been applied with great success in Paris to the propulsion of sewing machines, wood-working apparatus and printing machines. A correspondent of the the *Manufacturers' Record* suggests that "if some of our industrial or mechanical papers, or some of our engineers or mechanics, who are visiting Paris, would write a full history of the use of compressed air in that city, stating outlay for original plant, method of distribution, also stating the amount of power that may be furnished each consumer, and the cost of the same per horse-power, it might be doing our industries a substantial service."

BEFORE FRANKLIN.—It is said that a curious discovery has recently been made which shows that as far back as 1746 an Italian physician wrote a book called "Electricity, or the Electrical Forces of Nature," in which he discussed the nature of electricity and advanced many ideas that have since proved to be correct. The close relations between the phenomena of electricity and lightning were discussed, and a very close approach to the truth as since developed was made upon numerous points. Franklin's experiments with the kite were made on June 15, 1752, six years after the book above referred to claims to have been written.

YOUR OWN WEATHER PROPHET.—When a storm is advancing, the wind blows to meet it. Thus a wind blowing from the east or southeast indicates the approach of a storm from the west. When the storm center has passed, however, the wind changes and follows the storm. If a person has a good barometer and a wind-gauge he can tell pretty correctly when a storm is coming. Without the instruments the clouds may be watched, and when seen to be moving rapidly from the southeast, and there are indications of the presence of much moisture in the air, a storm is not far away.

A CURIOUS FUNGUS GROWTH may be seen, says the Worcester *Gazette*, at Oakdale, near Worcester City. On an old cutting-block there is a fungus growth the shape of a cabbage rose, with large unfolding leaves of a bright orange color in the center, shading to a pale lemon on the edges; the outside leaves are as large as a breakfast plate, growing smaller in the center. It measures three feet four inches in circumference and 13 inches in diameter, the whole growth being made in ten days. It presents a very beautiful as well as novel appearance.

Good Health.

The Use of Water.

There is no remedy of such general application, and none so easily obtainable, as water, and yet nine persons in ten will pass it by in emergency to seek for something of less efficacy. There are but few cases of illness where water should not occupy the highest place as a remedial agent. A strip of flannel or a napkin wrung out of hot water and applied round the neck of a child that has croup will usually bring relief in ten minutes. A towel folded several times and quickly wrung out of hot water and applied over the seat of the pain in toothache or neuralgia will generally afford prompt relief. This treatment in colic works like magic. A physician writes: "We have known cases that have resisted other treatments for hours yield to this in ten minutes. There is nothing that will so promptly cut short congestion of the lungs, sore throat or rheumatism as hot water when applied promptly and thoroughly. Pieces of cotton batting dipped in hot water and kept applied to sores and new cuts, bruises and sprains, is the treatment adopted in many hospitals. Sprained ankle has been cured in an hour by showering it with water poured from a few feet. Tepid water acts promptly as an emetic, and hot water taken freely half an hour before bedtime is the best cathartic in the case of constipation, while it has a most soothing effect on the stomach and bowels. This treatment continued for a few months, with proper attention to diet, will alleviate any case of dyspepsia."

Water in Digestion.

Opinions differ as to the effect of the free drinking of water at meal-times, but the view generally received is probably that it dilutes the gastric juice and so retards digestion, says *Medical Classics* Apart from the fact that a moderate delay in the process is by no means a disadvantage, as Sir William Roberts has shown in his explanation of the popularity of tea and coffee, it is more than doubtful whether any such effect is in reality produced. When ingested during meals, water may do good by washing out the digested food and by exposing the undigested part more thoroughly to the action of the digestive ferments. Pepsin is a catalytic body, and a given quantity will work almost indefinitely, provided the peptones are removed as they are formed. The good effects of water drank freely before meals have, however, another beneficial result—it washes away the mucus which is secreted by the mucus membrane during the intervals of repose and favors peristalsis of the whole alimentary tract. The membrane thus cleansed is in a much better condition to receive food and convert it into soluble compounds. The accumulation of mucus is specially marked in the morning, when the gastric walls are covered with a thick tenacious layer. Food entering the stomach at this time will become covered with this tenacious coating, which for a time protects it from the action of the gastric ferments, and so retards digestion. The viscid contents, a normal condition in the morning before breakfast, are not suitable to receive food. Exercise before partaking of a meal stimulates the circulation of the blood and facilitates the flow of blood through the vessels. A glass of water washes out the mucus, partially distends the stomach, wakes up peristalsis and prepares the alimentary canal for the morning meal. Observation has shown that non-irritating liquids pass directly through the "tubular" stomach, and even if food be present they only mix with it to a slight extent.

Silk Veneers.—One of the most remarkable uses to which silks and other fabrics are being put of late, says a contemporary, is the veneering of fancy furniture. This latest wrinkle has not as yet gone into general use, but the extent to which the idea can be utilized appears well-nigh unlimited. In the parlor of a house on West Walnut street, which is tenanted by a wealthy merchant, there is a very beautiful display of veneering in silk and cretonne. The walls of the large room are done in raised panels of plain wood, and over each of these panels a piece of silk, upon which is painted by hand a beautiful design of flowers, is stretched and tacked on the back of the panel so that there is not a crease to indicate the presence of so foreign a substance. Each alternate panel is covered with satin, and the sheen is simply beautiful under a mellow gas light. The idea has even been carried to the fragile little table that stands in the center of the room. That is covered with satin, on which a pretty baby face is painted by hand, and the substance has been treated with numerous coats of transparent varnishes which completely filled up the interstices in the fabric until it can hardly be distinguished from highly polished wood. This system of decorating has been found to be quite as cheap as the wood veneering, and in richness of appearance the silk veneers appear fully equal to the finest effects in woodwork.

The Curiosities of Taste.—A physiologist discoursing on the sense of taste says: Strictly speaking, with the tip of the tongue one can't really taste at all. If you put a small drop of honey or of oil of bitter almonds on that part of the mouth you will find, no doubt to your great surprise, that it produces no effect of any sort; you only taste it when it begins slowly to diffuse itself, and reaches the true tasting region in the middle distance. But if you put a little cayenne or mustard on the same part you will find that it bites you immediately—the experiment should be tried sparingly—while if you put it lower down in the mouth you will swallow it almost without noticing the pungency of the stimulant. The reason is that the tip of the tongue is supplied only with nerves which are really nerves of touch, not nerves of taste proper; they belong to a totally different main branch, and they go to a different center in the brain, together with the very similar threads which supply the nerves of smell for mustard and pepper. That is why the smell and taste of these pungent substances are so much alike, as everybody must have noticed, a good sniff at a mustard-pot producing almost the same irritating effects as an incautious mouthful.

Simple Relief for Lung Troubles.—It has long been known that pine-needle pillows would alleviate persons afflicted with lung troubles, and a Florida editor relates an incident in support of the fact as follows: During a visit to the home of a most estimable lady living on Indian river, this editor was told of a discovery that had been made which may prove a boon to sufferers from lung or bronchial troubles. This lady having heard that there was peculiar virtue in a pillow made from pine straw, and having none of that material at hand, made one from fine, soft, pine shavings, and had the pleasure of noting immediate benefit. Soon all the members of the household had pine-shavings pillows, and it was noticed that all coughs, asthmatic or bronchial troubles abated at once after sleeping a few nights on these pillows. An invalid suffering with lung trouble derived much benefit from sleeping upon a mattress made from pine shavings. The material is cheap and makes a very pleasant and comfortable mattress, the odor of the pine permeating the entire room and absorbing or dispelling all unpleasant odors.—*Scientific American.*

Revolution in the Process of Decorating China.—The old process of decorating china is likely to be revolutionized by a discovery made by J. B. Bonnaud, a Frenchman. By his method it is possible to obtain in a few minutes the same artistic effects which cost the hand-painter on china days of labor. Landscapes, groups of figures, and portraits are produced by this means on vases, plates and plaques, in their natural colors, even to the most delicate shades.

A Cholera Specific.—It is claimed that Dr. Loewanthal, who is in the employ of the French Government, has discovered a sure specific for cholera. It is a substance called salol, which upon being taken into the stomach is disassociated by the action of the pancreatic juice into salicylic acid and a minimum of carbolic acid, which is said to be just sufficient to kill the germ of cholera. Tests made with the remedy are said to be in the highest degree satisfactory.

Useful Information.

New Method of Preparing India-Rubber.—A new method of preparing india-rubber is announced, which, if successfully carried out, will have a marked effect on the rubber industry. The poor hulero (as the collector of india-rubber is called) has anything but an enviable lot. He has often to penetrate the deep forests in search of the trees from which the milk is drawn, and is exposed to danger from wild beasts as well as to frequent want of water. Weary and harassed, it often happens that he spills much of the milk on the way, and still more is lost by fermentation; and of the quantity that is actually brought into camp, it is not unusual to have to sacrifice at least 40 to 50 per cent of the contained rubber. The new process causes the rubber contained in the milk to be coagulated instantaneously, and secures every particle of contained rubber, as against the one-half which the present method gives, and, moreover, the rubber is at once clean and pure. The operation is so simple that any native can carry it out at the foot of the tree which has been bleeding, and thus, instead of carrying large cans of milk of great weight and entailing great loss on the way, he simply carries in the sack solid rubber, which, on his arrival at camp, can be at once prepared for the market and shipped. Several tons actually prepared on the spot by this new process are highly spoken of, and afford, what has long been desired, a clean, pure and dry rubber of the first quality.

To Restore the Freshness of Worn Clothing.—The mystery to many people how the scourers of old clothes can make them almost as good as new is explained in the *American Analyst* as follows: Take, for instance, a shiny old coat, vest, or pair of pants, of broadcloth, cassimere or diagonal. The scourer makes a strong, warm soapsuds, and plunges the garment into it, souses it up and down, rubs the dirty places, if necessary puts it through a second time, then rinses it through several waters and hangs it to dry on the line. When nearly dry he takes it in, rolls it up for an hour or two, and then presses it. An old cotton cloth is laid on the outside of the coat and the iron passed over that until the wrinkles are out; but the iron is removed before the steam ceases to rise from the goods, else they would be shiny. Wrinkles that are obstinate are removed by laying a wet cloth over them and passing the iron over that. If any shiny places are seen they are treated as the wrinkles are—the iron is lifted while the full cloud of steam rises and brings the nap up with it. Cloth should always have a suds made specially for it, as in that which has been used for white cotton or woolen clothes lint will be left in the water and cling to the cloth. In this manner we have known the same coat and pantaloons to be renewed time and time again, and have all the look and feel of new garments. Good broadcloth and its fellow-cloths will bear many washings, and look better every time because of them.

Sugar in China.—The Chinese, who invented almost everything before any body else heard of it, claim to be the original inventors of sugar-making. It is said the Chinese have used sugar for 3000 years. It is well known from other than Chinese authorities that they used sugar at least 2000 years ago. India also claims to be the inventor of the first sugar-making process, but the Hindoos undoubtedly obtained their knowledge from China. Nearchus was sent by Alexander the Great to explore the Indus, and brought back reports of "honey" which he said was made by the Asiatics from cane without the help of bees. At this time neither the Greeks nor the Jews, nor Babylonians, had any knowledge of sugar, but later the art of making the artificial "honey" became known and practiced, though its progress and development were exceedingly slow. It was prescribed as a medicine by Galen A. D. 150, and up to the 17th century it had become nothing more than a costly luxury, to be used on special occasions. Even as late as the beginning of the 18th century the annual consumption of sugar in Great Britain had reached only 20,000,000 pounds, whereas it is now more than 2 000,000,000 pounds. Refined sugar was not made in England till 1659. The art of refining was learned by a Venetian merchant from the Saracens, who sold the secret to him for 100,000 crowns.

Building from the Roof Down.—A visitor to Japan tells of the peculiar methods of construction employed in that country. "Speaking of house-building, the Japanese begin their work at the top. The roof goes on first, and then they begin to build the walls and to construct the interior. One of the greatest curiosities to me in Tokio is a new hotel which is being built. It is to be on the foreign style and is to have four stories. It will be the greatest hotel in Japan. It covers about an acre of ground. As yet not a stone of the foundation has been laid, but the roof is already up and this stands on a great four-story skeleton of scaffolding awaiting the building of the rest of the structure. This scaffolding is made of long poles from the size and thickness of a campaign flag-staff down to the size of a bamboo fishing-rod, and the whole is tied together with ropes. Imagine an acre of scaffolding of this nature upholding a heavy roof and the whole made up of sticks and ordinary rope. There are, I was told at the office, 7000 poles in the skeleton, and 2000 men had been at work for months in making it."

The World Full of Death Traps.—According to the *American Analyst*, the worst enemies of the human race are the doctors, who try to prolong our miserable existence in a world full of death traps. One medico tells you not to eat or drink what you relish because you will eat or drink too much. Another says you must only eat what you fancy, because otherwise you will bolt your food without giving to each morsel the 36 mastications which are necessary for digestion. You must wear a respirator over your mouth, a pad on your chest, and a swarth of flannel round your loins. If you live in town, you will die of fog; if you go to the country, you will be poisoned by bad drainage; if you drink water, you are tempting the typhoid fiend; milk spells scarlatina, and tea cake is sudden death. Do you shun these tempestuous pleasures of the senses and take refuge in the recreations of the mind? Do you borrow a novel from the circulating library? That is to import the germs of disease into a healthy household. The volume in your hands may have been perused by a person recovering from an infectious illness!

Caring for Furniture.—With care furniture may be kept looking nice for years, but without this care it soon becomes dingy and shabby. A thorough cleansing, once a month at least, should be given to upholstered furniture that is in everyday use. Articles covered with plush or any goods with a pile may be brushed with a bristle brush, but for haircloth a light switch works the best, wiping off the surface afterward with a damp cloth. Wipe the woodwork with a damp cloth, and if there are any dents in it, it is said the application of several thicknesses of wet blotting paper held in place, till dry, by a warm flatiron, will remove the dent, unless a very deep one, when several applications may be necessary. When the woodwork is dry rub with warm linseed oil and polish with chamois skin. White spots may be removed by alcohol simply pressed on the spot by a cloth that is not linty, and not rubbed, as rubbing will take off the varnish. A flannel cloth moistened with kerosene is good to rub the furniture with, and the disagreeable odor of the oil soon disappears.—*Woman's World.*

Engineering Notes.

A Great Engineering Project.—The construction of a ship railway across Chignecto neck, the narrow isthmus separating the bay of Fundy from the headwaters of the Gulf of St. Lawrence, and connecting Nova Scotia and New Brunswick, has been commenced. At present, vessels coming down the St. Lawrence and bound for St. John, New Brunswick, or for United States ports, must sail around the stormy coast of Nova Scotia, a distance of 700 miles. Chignecto isthmus is 17 miles across. The contracts for the work have been let, and cutting has been commenced in various sections. The work is estimated to cost £1,100,000 The Dominion Government has so much faith in the enterprise that it has granted to the company an annual subsidy of £35,000 for 20 years. If the earnings of the road exceed seven per cent then half the surplus is to be paid back to the Government until the sum advanced by it has been replaced. The work will be completed in 1892. The railway will lessen by 500 miles the distance between the St. Lawrence ports and the cities of New York, Boston, and Portland. Its effect on commerce will be immeasurably great. By being carried across the Chignecto Marine railway, American fishing vessels can make two trips a season instead of one. Grain vessels from the lake ports will reach New England direct. It means cheap bread and cheap fish. Ships will be lifted upon an iron cradle which rests upon wheels. They will be then conveyed by gigantic locomotive engines at the rate of ten miles an hour. The railway will carry ships of 1000 tons burden. It is designed especially for the lake and fishing trade. Ships will be raised upon the tracks by means of hydraulic lifts similar to the kind now used by dock companies.

Hydraulic Elevators on Canals.—The success of the French experiment has directed much attention to the substitution of hydraulic elevators in place of locks in raising canal-boats from one level to another. This mode is especially valuable in saving time when there is a number of locks in succession. The plan in such a case consists, briefly, of two "chambers," reaching the whole distance from the level of the canal above to that of the canal below. In each chamber there is a movable basin, resting on the head of an enormous piston, which goes down into a cylinder below the level of the lower canal, and this piston is worked by hydraulic pressure; the upright tubes can be connected or disconnected below by opening or closing an immense paddle-door—the basin containing the boat being thus made to slide up or down in the chamber, to the walls of which it is fitted. Supposing a boat to have moved into one chamber from the level of the canal below, and another into the other chamber from the level of the canal above—the superior weight of the higher boat and the water floating it in the basin rapidly sinks it, until both boats are in the middle, when an equilibrium would naturally occur. To remedy this, the water is withdrawn from the basin of the ascending boat, when a very moderate addition of hydraulic pressure causes it to rise to the level of the upper canal, as the other boat sinks to that of the canal below. By this means boats are raised or lowered in three minutes instead of six hours, as formerly in the series of locks. The chambers or tubes are, of course, very strongly made, being lined with copper and ribbed with steel.

Revolving Sails.—The Vogt system of the propulsion of ships by means of revolving sails acting in the air, has been discussed by the British Association for the Advancement of Science, the advantage to be gained over the ordinary form of screw propulsion being enumerated as follows: A saving in engine-power by eliminating the disturbing action of the screw; the form of the ship can be determined with reference to least resistance and seaworthiness only, and the division into water-tight compartments can be complete. The change in trim is less disadvantageous when the power is applied above the deck than below the center of gravity; the vibrations caused by the screw propeller, which are destructive to the ship and most unpleasant to those on board, are avoided; and such an air-propeller utilizes the natural wind-power. In its outward shape, this air-propeller is somewhat similar to the ordinary water screw, with sails or blades made of thin sheet steel, having the greatest width near the circumference. The pitch of the blades is capable of being varied in order to utilize the power of the wind according to circumstances, the fact being that nearly 80 per cent of the winds, the whole compass round, augment the thrust of the propellers in this arrangement.

An Aerial Railway.—Some Swiss engineers are planning an aerial railway by which they propose to connect two of the peaks of Mount Palatus with wire ropes about 2000 feet long, and to send tourists from summit to summit in cars sliding along the wires.

The Tehuantepec Route.—It is said that a Dresden bank has contracted to provide the Mexican Government with the capital to construct a railroad across the isthmus of Tehuantepec. The Krupps are to furnish the iron and steel for the road.

MINING AND SCIENTIFIC PRESS.

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[NEW THIS ISSUE.]

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Books—Henry Carey Baird & Co., Philadelphia, Pa.
Partner Wanted—"C. H. C.," Box 2517.

See Advertising Columns.

Passing Events.

During the past few weeks forest fires have been raging in many parts of this coast. In the mountains of the interior great damage has been done. Immense tracts of country have been burned over.

It is stated that deep mining will again be prosecuted on the Comstock in all the principal mines. The lower levels have been flooded, but will now be pumped out. This will give employment to more men.

Notice has been given that an ordinance will be introduced at the next meeting of the Supervisors providing for an inspection of steam boilers. The recent disastrous explosion at Oakland has again called up the subject of boiler inspection.

The silver discoveries in the Barrier district, N. S. W., have resulted in some wonderful mines being opened. Quite recently a mine supposed to be the equal of the Broken Hill has been developed. New South Wales is now turning out an immense quantity of silver.

ST. JOSEPH has met with a serious misfortune in the destruction of her main Exposition building, with all its contents.

Silver Discoveries in New South Wales.

To open up an almost abandoned mine where many fortunes had been made and lost, and to make its future assured, as it promises to be only second to the greatest silver mine in the world, is interesting in some of its details, but more so when it marks the dawning of an era in colonial affairs that will undoubtedly lead ultimately to a complete confederation of all the colonies. From Sydney, Adelaide and Broken Hill papers received by the last steamer, we find that great excitement was caused by a most remarkably rich discovery that had been made at the Central mine. This was even far more extensive than the rich find their general manager, Mr. F. F. Thomas, made in the month of June. At that time he opened up a body of ore 20 feet in width on the 300 level averaging 100 ounces silver per ton. He drifted on it over 120 feet, with same character of ore each end, and was still driving ahead each way. Now the topic of the hour in mining circles in the antipodes is their latest development in the Central mine and its general manager, Mr. Thomas. This mine adjoins the Great Proprietary on the south. It was prominent in last year's great silver boom. At that time a supposed bonanza on its 200-foot level was discovered, and the Central shares ran far beyond the legitimate value. The discovery proved a "short-curried horse," fortunes were lost, the manager resigned, the mine fell into disrepute, and, as an Australian editorial puts it, "for months the property stank in the nostrils of those who had invested in its scrip at high prices."

Another manager took hold of the property and he was quietly informed that the mine had been worked out. Making no improvement, it seemed that the Central was doomed; that the vein had cut out and was only a bunch of ore. He, too, resigned, and the directors looked this way across the sea. They possessed abundance of means to open up the property if some engineer could show them a mine. This, from all that can be learned of colony papers, Mr. Thomas has done. When he went from here to New South Wales as a mining engineer he was not only equipped with a fine technical education gained at Yale College, but also with the experience obtained in 25 years work in the mines on this coast. Those who know the gentleman will indorse the remarks of a Broken Hill paper, that the directors of the company are to be commended in the first place for their pluck in going to the expense of obtaining from abroad the experience that is necessary for the successful management of a large silver mine in all its departments, and secondly congratulated on their good fortune in obtaining such an able manager in the person of Mr. Thomas.

On his arrival the task before him seemed almost a helpless one from all the appearances of the drifts and crosscuts. We learn from the papers he set himself to the work of following up his plans in so systematic a manner that it left an impression at once; there was no pot-hole work about his operations. In sinking the main shaft he discovered the body of ore on the 300 mentioned above, and has not reached the end of the ore chute as yet in his drifting. In every winze and crosscut he struck pay ore nearly, if not every, time. On the 200 level he put his men to work in an abandoned crosscut (the face being, however, in hard silicious, barren rock) to carry out a cherished idea of his, to prospect for a western vein on this great fissure lode. The pump temporarily getting out of order, and water driving the men from the bottom level, it was his opportunity to push this crosscut with all dispatch. What was thought to be a country-wall rock proved to be of slight length; some five feet or more he broke into a vein of rich carbonate of lead ore, carrying chlorides and iodides of silver. The crosscut has been driven 22 feet, with no sign of the west wall, and the same character of ore continues. The colony papers say that, judging from all appearances and general characteristics, it will in all probability be found a very large body.

This wonderful discovery is simply tantamount to the finding of a new mine. It is generally believed that, without doubt, the Central mine has now the famous Proprietary vein, in all its richness.

The shares of the Central mine were selling at 9s. per share at the time of Mr. Thomas' arrival, and now from Melbourne and Sydney market quotations they are £6 5s. per share.

As to the immense importance attached to these recent discoveries of ore in the Central mine, we glean from Australian papers that it has awakened Sydney, Melbourne and Adelaide people, respectively, in New South Wales, Victoria and South Australia to the fact that Broken Hill and the Barrier possesses a trade which is now wooed on every hand. They all want it. At present, without going into statistics, Broken Hill and the Barrier is responsible for about 6 5 per cent of the world's silver production, and hence it must to some extent influence the price of the metal. The distance by rail from Sydney to Broken Hill via Melbourne and Adelaide is 1419 miles.

Hydraulic Mining Abroad.

Some of the hydraulic mines in the U. S. of Colombia, which are owned by residents of London, have been paying very well of late, notably the Colombian Hydraulic Co. and the Orita Hydraulic Co. The shares of the two concerns stand at about 100 per cent premium in the market. The former, on a capital of £75,000, has realized £25,449, of which the profit was £16,447, or 64 per cent of the gross returns. In the past 2½ years the company has returned half the nominal capital in dividends. English capitalists are much interested in this class of mines, but of course no longer invest in them in this State, though they hunt them up elsewhere.

It is of interest to note that an English firm which manufacture fire-engines, etc., have devised an engine for throwing a stream against a gravel-bank, so that water can be taken from any depth below where it is wanted, reservoired and brought to bear on any given spot. The apparatus is simply a modification of that used by the London fire brigade. The monitor is mounted on a carriage and can be directed at any angle close to the bank, or removed from it, with ease. Power is obtained from a boiler such as is used in torpedo boats. The monitor will throw a jet 250 feet above the position from which it is worked. The capacity of the pumps is about 1600 gallons a minute. A feature of this engine, and one to which considerable importance is to be attached, is this: That it may, in the first place, be used to pump water from a river miles distant into a reservoir; and then, with the same appliance, this water can be brought to bear upon any given spot as desired.

MR. JOHN A. BRASHEAR, the well-known astronomer and maker of astronomical instruments, has received a bequest of $2000 from the late Wm. Thaw of Pittsburg, and also free use of the residence and factory (which belonged to Mr. Thaw) for ten years. Some "prophets" are appreciated in their own country. Mr. Brashear visited San Francisco last winter and made many warm friends while here. As a maker of astronomical appliances and instruments of precision, Mr. Brashear has achieved an enviable reputation, both in this country and Europe, the large star spectroscope at the Lick Observatory being a tribute to his skill.

AMADOR COUNTY has been awarded the first prize in "county exhibits" at the State Fair. The premium is $500. Nevada county was awarded the second premium of $400; Colusa county the third of $400; San Joaquin county, fourth premium of $300; Humboldt county fifth premium, $300; Fresno county, sixth premium, $200; and Merced county seventh premium, $200.

CHAS. A. CLARK of Nelson, Butte county, showed us this week some coal, or lignite, which he took from a claim recently discovered by him in Washington Territory. A number of seams were found on the hill, the largest ten feet in width. The coal burns well. Mr. Clark is having an analysis made in this city.

THE CHARLESTON.—The Union Iron Works have tendered the cruiser Charleston to the Government. The horse-power developed was slightly less than the requirements, but it is not probable that the penalty will be enforced, as the vessel is highly satisfactory in all other ways.

IT required 2,500,000 bricks for the smoke-stack of the new Ryan smelter at Tacoma.

Astronomical Society of the Pacific.

The next regular meeting of the Astronomical Society of the Pacific will be held in the library of the Lick Observatory, on Saturday, Sept. 28th. Papers will probably be presented:

"On Drawings of the Planet Jupiter in 1880-85," by Mr. E. E. Barnard; same in 1875, by the president, E. S. Holden.

"On Relation Between the Diameter of a Photographic Star Disc, the Aperture of the Telescope and the Exposure Time," by Mr. J. M. Schaeberle.

"On Relation Between the Darkening of a Photographic Film and the Time of Exposure," by Mr. A. O. Leuschner.

Members will take the earliest trains (broad gauge) from foot of Market street (via Niles), or from Third and Townsend streets, arriving at San Jose shortly before 10 o'clock on Saturday morning. They will be met at the station by stages. The start from San Jose will be made promptly at 10 o'clock, in order to arrive at Smith Creek about half-past one. Here dinner will be had, and by starting promptly the summit can be reached about 4 o'clock. A meeting of the Board of Directors will be held in the library immediately on arrival, and as soon thereafter as may be, the meeting of the society will be called to order. The observing-rooms are not open till 7 P. M., and the time after adjournment until then can be well utilized by taking a short walk to one of the neighboring summits, from which magnificent views of the valley can be had.

At 7 P. M. the domes of the 12-inch and 36-inch equatorials are opened, and all visitors take their turns in looking at the most interesting celestial objects which are in a convenient situation. About 10 P. M. the visitors leave, and the members of the society will then have a further opportunity of seeing other heavenly bodies. As many of the members as can be accommodated by the astronomers resident at Mt. Hamilton will be personally invited to spend the night on the summit. The others must return to Smith Creek hotel in the stages, which will leave the summit about 11:30 P. M. At the hotel, rooms will be ready for members of the society. The stages returning to San Jose leave Smith Creek about 8 A. M. and 1 P. M., in time to connect with the various trains to San Francisco.

Nicaragua Ship Canal.

As long ago as 1528 there was talk of a canal across the Isthmus of Panama, and a route by way of Nicaragua was suggested in 1551 by a Spaniard named Gomara. In 1825 the Central American Republic sought the co-operation of the United States in building a canal via Nicaragua, and a contract was made, but the necessary capital was not supplied. The more recent project, elaborated by A. G. Menocal of the U. S. Navy, was based on surveys made in 1872-73 at the expense of the U. S. Government.

The proposed route extends from the harbor of Greytown on the Caribbean sea to Brito on the Pacific. Its total length is 169.8 miles, of which 38.98 miles will be excavated canal, and 130.82 miles' navigation by Lake Nicaragua, the river San Juan (the outlet of the lake), the basin of the river San Francisco, and through seven locks. A canal without locks is impracticable across Nicaragua, and one with locks must necessarily have the lake for its summit level. This inland sea is about 90 miles long and from 35 to 45 miles wide. It is about 110 feet above sea-level. The lake will be connected with the Pacific by a canal, with the Atlantic by slack-water navigation in the river San Juan, and by a short section of canal from the river San Juan to the basin of the river San Francisco, and navigation through this basin by a canal from the eastern end of that basin to the Caribbean sea.

The report of the U. S. surveying party under Engineer Menocal is one of great general interest. Besides the maps and sections, it is accompanied by many views of that part of the world, one of which, Corinto harbor, is given on page 221. In January, 1885, when Mr. Menocal was there, there were 13 vessels in this harbor loading with dye-woods and coffee, destined mostly for Europe via Cape Horn.

EDISON, the American inventor, is being lionized whenever he goes in France and Germany.

Construction of Maps in Relief.

Continuing this subject from last week's PRESS, the following method is given of making the casts when the modeler desires to do so. Inclose the relief in a wood frame, oiled or soaped to prevent the adhesion of the plaster, and place the whole on a flat surface to secure an even distribution of the liquid mass when poured into the mold. A sufficient quantity of water is then taken in a suitable vessel, into which plaster of Paris is carefully sifted through a fine-mesh sieve, rapidly stirring to prevent the formation of lumps and air-bubbles in the mixture. When it arrives at the consistency of cream, it should be poured into the mold and allowed to stand until partially set. A straight edge should then be drawn across the top of the frame to remove the surplus plaster level with its upper edge. Large casts may be strengthened with iron rods or with wire netting inserted soon after the plaster is poured into the mold; and the weight of a thick cast may be reduced by hollowing out the plaster from the under side before it gets thoroughly hard. In a short time the plaster will be sufficiently hard to turn over, when the frame may be removed and the wax original separated from the cast. The writers prefer to dry the mold after retouching and to apply a coat of thin shellac varnish to the plaster negative before casting a positive. When time is an element, a positive may be made immediately by brushing the mold with a solution of soap-water before casting.

The finish of a model depends on the purpose for which it is to be used. For photographic prints or photo-mechanical reproduction, the surface features can be put directly upon the plaster in black, india-ink, or paint.

Fig. 6 is a relief of the western end of the Northern anthracite coal-field, prepared in india-ink for photo-mechanical printing by the Ives process. If it is desired to color the model geologically or otherwise, a thin coat of shellac varnish is applied, and it may then be colored in oil. The artistic map-maker will have no difficulty in giving character and finish to his cast, but unskillful drawing and poor lettering will ruin the appearance of otherwise good work.

The use of contour curves to delineate underground topography originated with Mr. B. S. Lyman about 1865, and the first model based on his map was made to illustrate the complicated structure of the Cooper or Bennett coal-beds at the Hutchinson mine of the Plymouth Coal Company, Plymouth, Luzerne county, Pa.

The method of modeling last described is admirably adapted for the construction of underground relief; and a plate showing, on this plan, the workings in the middle member of the Mammoth coal-bed at Excelsior colliery, Columbia county, Pa., is given in Fig. 7.

There is great diversity of opinion in regard to the relative scale admissible in the construction of relief maps, though the weight of opinion seems to be in favor of a slightly exaggerated scale.

The writers have avoided in their practice the distortion of the vertical, where possible, and believe it to be unnecessary in maps of large scale, say of 100 to 1000 feet to one inch, depending somewhat on the nature of the topography. Fig. 8 exhibits a piece of the South Mountain, Pa., constructed on the true scale, vertical and horizontal alike from map, Fig. 1 (last week), where the greatest elevation is 1000 feet. Fig. 9 shows the same territory with the vertical scale increased from 2 to 1.

Prof. J. P. Lesley does not believe in exaggerated reliefs. He says: "In 1865 I made a model of the underground of the Plymouth anthracite mine, with its remarkable vertical fault, from levels which I took in the mine. What good would this have been had I used a different vertical scale?

"I have myself made models on several plans; the most satisfactory, but the most laborious, being to draw a good many cross-sections on the same vertical and horizontal scale, along parallel lines, as nearly as possible at right angles to the general strike; then cut strips of wood, lead, zinc, or stiff paper (I have used all four) to represent the cross-sections; set these up in their places, fill in with wax or plaster, and finally tool the surface thus obtained. I prefer this method to the common one of jigging out the contour curves and filling the terraces between them with slopes of wax. The latter method is easier and less costly; but it is sure to make the modeler slovenly in his geological representation, and it is a powerful seduction toward exaggeration of the vertical scale. Beginners and earnest scholars ought not to be allowed to use this method until they have been drilled to accuracy and to love the true natural aspect by the compulsion of the method of cross-sections."



Fig. 6.—MODEL PREPARED FOR PHOTO-MECHANICAL PRINTING.

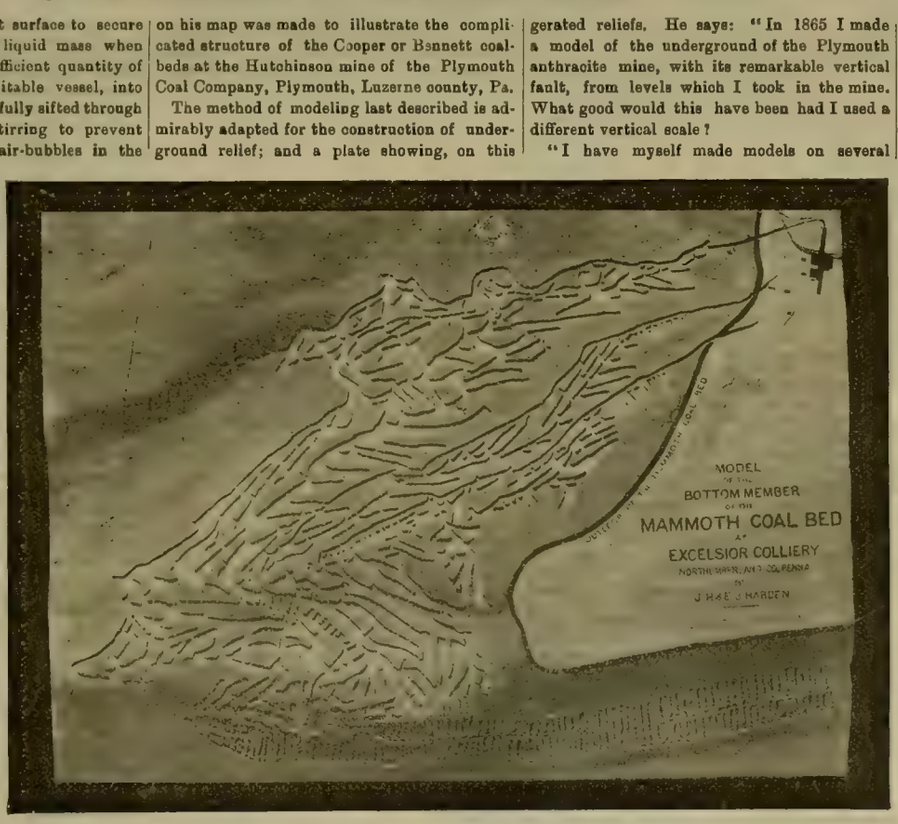


Fig 7.—MODEL OF AN ANTHRACITE COAL MINE.

Probably one of the largest relief-maps or models ever made was of the earth, 60 feet in diameter, covering 10,000 feet of surface and exhibited by Mr. Wyld in Leicester Square, London, in 1851. The horizontal scale was 10 miles, the vertical 1 mile to 1 inch. The view was taken from the interior, the delineation being on the concave instead of the convex surface. There was no writing upon the model; the sea was colored blue, and the land of as natural a tint as possible.

Lieutenant H. A. Reed, in his work on topographical drawing, recommends the following exaggeration as affording a pleasing relief: "For a map scale 6 inches to 1 mile; if mountainous, $\frac{1}{3}$; if only hilly, $\frac{1}{2}$; if gently undulating, $\frac{2}{3}$. For smaller scales, except for very rugged tracts, the exaggeration should be correspondingly increased. For a tract consisting wholly of mountains, no exaggeration is necessary."

The importance of relief maps for educational purposes was shown at the exhibition of appliances used in geographical education, held by the Royal Geographical Society of Great Britain, in December, 1885, when a large number of such maps were exhibited by the various countries of Europe.

It is desirable that a cheaper method of duplicating models be found; and experiments are being made by the writers (J. H. & E. B. Harden) toward this end. Plaster of Paris is for many reasons a good material; but its weight and its liability to damage in transportation render it unsuited. Paper seems to be best adapted to meet the requirements of the case.

Preserving Piles.

The Anderson and Elias Covering.

A great many chemical pile-preserving compounds have been tried to prevent the attacks of the teredo and limnoria on the submerged timbers of wharves. It has remained, however, for a California inventor to perfect a mechanical method of preventing the ravages of these troublesome pests. This consists of a metallic jacket perfectly surrounding the pile from the surface of the mud to high-water mark.

This jacket is formed of the rustless steel manufactured by the Pittsburg Rustless Iron Works and does not corrode in salt water, but will last an indefinite period. The steel jacket consists of two flanged segments and drawn together by bolts and rivets through the flanges. It is claimed that an eighth-inch pile after being encased by the steel shell is as strong as a common 12 inch pile, and a saving of 20 per cent in piles can be effected by using the jacketed piler, the flange on each side acting the same as T-iron for support. We gave engravings of the system of protecting piles in the MINING AND SCIENTIFIC PRESS of Dec. 15, 1888.

One thing claimed by the patentees of this pile covering is, that the steel sheathing makes the piles stronger, and for that reason they may be placed farther apart when building a wharf. In other words, it requires but 800 piles with this covering, to do the work of 1000 unprotected piles. The piles are prepared and covered before being driven into place.

There is no danger in driving the prepared pile of loosening any part of the covering, as

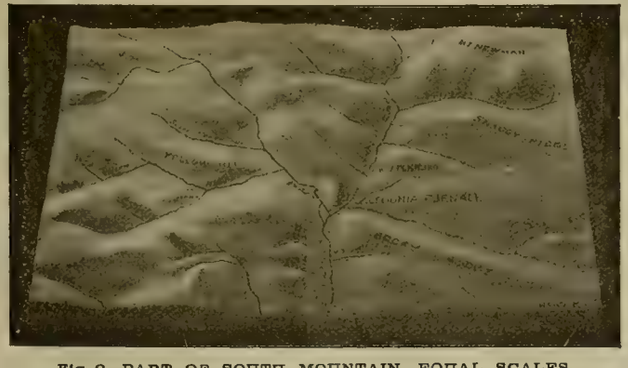


Fig. 8.—PART OF SOUTH MOUNTAIN, EQUAL SCALES.

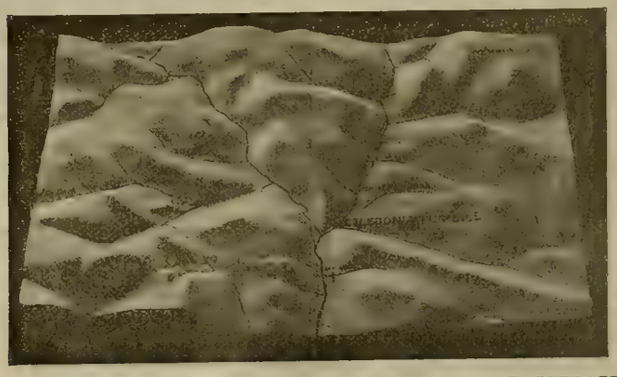


Fig. 9.—PART OF SOUTH MOUNTAIN, VERTICAL SCALE EXAGGERATED.

the covering has flanges with holes in it to receive rivets every 2½ inches apart. The pile is turned in a lathe and properly smoothed down to a straight line, and after that covered with hot coal tar mixed with asphaltum. The jacket is then riveted firmly around the pile, which makes it perfectly water-tight underneath the jacket. There is no danger to the covering after the pile has been driven from the jarring of the wharf, which is always in motion, especially during stormy weather, when ships are moored to wharves, as the spring of the pile will be between the jacket and the mud.

A machine is now in process of construction at the Atlas Iron Works (J. B. Jardine, proprietor), for the purpose of turning the piles which are to receive the jacket of the rustless steel, 30 tons of which are now on the way from Pittsburg, Penn. The whole plant will be placed on some portion of the water-front.

A very strong company, called the Anderson & Elias Teredo-Proof Pile Co., has been organized in this city with a capital stock of $1,000,000, in 100,000 shares. The corporation has been organized to build wharves and piers, using this patent, and all who are desirous of gaining any information regarding the above can do so at the office of the company, room No. 6, Hansford Block, 132 Market street, the officers being Henry Anderson, general manager, and L. H. Anderson, secretary.

The International Monetary Congress.

That the advocates of bimetallism are gaining in numbers is witnessed by pronounced organs of monometallism not being so outspoken in their views, and covertly admitting that bimetallism may possess more merit than heretofore given credit. The advocates of bimetallic currency appear only too desirous to secure discussion on the subject, well knowing that, free from prejudices and placed on the broad plane of commercial and financial advantages, their views will win recognition. Believing fully in this, the representatives in France of the double standard metallic currency arranged in conformity to the French Ministerial decree of Dec. 6, 1888, for a Monetary Congress connected with the Paris Exposition. To this Congress were invited leading representative writers and speakers on monetary subjects both in the Old and New World, but chiefly from among those who have won recognition in Europe.

Paris cablegrams received last week announced that the Monetary Congress was convened on September 11, and also that there were 170 members present, including 23 representatives of European and other governments. This necessarily gives to the Congress an international character, which will give weight to its deliberations and gain for its conclusions a certain degree of recognition.

The program of the Congress is as follows:

First—Report of the Committee on Statistics named by the Committee of Organization. This committee will make a report from the latest works on the statistics of gold and silver and instruments of circulation and upon comparative monetary legislation.

Second—Inquiry into the causes of the fall in the value of silver relatively to gold. Should this fall be attributed to the increased production of the mines, or should it be attributed to the supension of the free coinage of silver in bimetallic States, or should it be attributed to these causes united?

Third—What injury do the fall of silver and the frequent fluctuations of its value relatively to gold cause to commerce in general, to industry, to agriculture and to Government finances?

Fourth—Examination of the means proposed for remedying this state of things. (*a*) Re-establishment of the former bimetallic system on a broader basis by means of an international agreement. (*b*) General adoption of the single gold standard and gradual demonetization of silver. In this eventuality, what transition measures would it be necessary to adopt?

Fifth—Advantages and disadvantages of monetary unions between various States, with reciprocal circulation. The amelioration and extensions of which such systems are susceptible.

Sixth—Maintenance of monetary circulation. Estimate of the wear and tear of coin. Influence of the wear and tear of coin on the premium paid for ingots and the rate of charges. Means of remedying it. Who ought to bear the expense of maintaining the circulation—private citizens or the State, or the group of States forming a monetary union?

Seventh—Various questions: (*a*) Inquiry into the best type for an international coin. (*b*) Observations in relation to subsidiary coins of silver, nickel and copper.

A careful reading of the program makes it quite evident that it is the intention of the promoters of the Congress to leave nothing undone by which a clearer idea of the relative standing of the single and double standard of metallic currency has in connection with the world's finance and commerce. The appointment of a statistical commission from the ablest representatives to report from the latest works on the statistics of gold and silver and instruments of circulation and upon comparative monetary circulation, shows they fully recognize what the action of the Congress should be grounded on. The following are the members of the committee: Messrs. Leon Say, president; Ad. Coste, P. Delombre, Fernand Faure, Fournier de Flaix and Alfred de Foville.

Wave Motors.

Action of Waves on Ocean Beaches.

EDITORS PRESS:—A writer in a journal in this city criticises the wave motor which I have constructed near the Cliff House in the following manner:

"We have recently examined this apparatus, not so much with a view to learning anything respecting 'wave force,' but as a matter of curiosity. A wooden truss frame is thrown across a notch in the cliff, resting on the rock at each side. A large pendulum with a vane at the bottom is swung beneath, and from this pendulum, about one-fourth the distance down from the center of suspension, links extend back, connecting with a cross-head and directly to the ram of a pump, which is supposed to force salt water up through a pipe of six or eight inches bore to the hill above.

"After a bird's eye view of the 'plant' below, we went up to the end of the pipe to see the discharge, but our climb there was like the young man from New York whom Mark Twain describes as sitting on the banks of a pool in Palestine waiting for a 'turtle to sing.' The song there, like the water here, was wanting, and our reflections sitting there on the sand were something as follows:

"The pendulous action of waves has tremendous force in a vertical direction, in acting on buoyant bodies, but horizontally nothing, or next to nothing, except the wash at the shore where the motion is broken up. Waves do not advance as is commonly supposed, that is, the water itself does not advance, merely rises and falls, and no horizontal force worth considering can be obtained. * * * As before remarked, and as must be obvious, there is no horizontal movement of the water except the 'swash' at the shore, where the pendulous or oscillating motion is arrested, and it seems to us, aside from the maintenance of a plant, the better way to utilize wave force is vertically.

"The force of waves, that is, the force of broken waves impelled by the wind, may exert a force of one ton for each foot of opposed surface, but the blow is sudden, and from the nature of the circumstances scarcely available for motive-power. In the first place, no plant not enormously expensive could be constructed to withstand the breaking force of waves at the shore. This we see illustrated in the case of vessels. So long as they have sea room they will ride out a gale, rising and falling with the seas, but as soon as driven ashore a vessel becomes fixed and does not yield, and if exposed to the force of breaking waves is destroyed."

This writer's examination appears to have been about as complete as his judgment, as he did not wish to learn anything, not even the fact that the pump was disconnected from the motor. A discharge of water could scarcely have been expected at that time, at the *upper* end of the pipe.

When preparing to build the motor at Point Lobos, I found that rocks of three tons weight were thrown by the waves or surf 100 feet to the inner end of the chasm and there ground to pieces. Was not power required to do that?

There was a cave at the end of the chasm into which the surf rushed, compressing the air to such an extent that when the wave receded, the water was often thrown more than 90 feet high, indicating *some power*. When a wave strikes a solid, a portion of the water is thrown into the air, the distance depending upon the shape of the object and the force or power of the wave, in some cases more than 180 feet high. [See Stevenson on Harbors.] Also, go to Point Lobos almost any day for smaller exhibitions. As there is force and motion, there is power.

Mr. Thomas Stevenson, to whom the above writer refers, "found the average horizontal force of the waves in the Atlantic ocean (not Pacific) to be 611 pounds per square foot in summer, and 2086 pounds in winter."

He states also that "the enormous mechanical power of the waves is in a *horizontal* direction." * * * "That the force of the waves moved a rock of 19½ tons weight, 50 feet above high water;" that the same force quarried a rock of 5½ tons, from a bed 72 feet above high water. * * * That at the Wick harbor works a section of the breakwater weighing 2600 tons was broken off and thrown over into the harbor.

He also states "*the action of a wave, therefore, is not momentarily, as in the case of a solid, but is continuous.*" * * * The italics are his. [See his work on "Harbors," 3d edition, chapter IV.]

I found there was power when I connected the pump to the motor and discharged the water with a pressure of 220 pounds to the square inch—a load of more than 12 tons and a *movement* of 46 feet of the motor. I could see no difference in the length of stroke when the load was on or off.

There is an average of about four waves per minute, with a force varying from 400 pounds to 6000 pounds per square foot (generally about 1800 pounds), 60 feet off the rocks at Point Lobos, and with my double-dash motor I can get an average of more than 30-foot stroke.

Dash plates 25 feet long by 8 feet high will transmit an average of about 500-horse power to the pumps; and this with a minimum risk, as all parts of the plant are round except the dash plates, which go with the sea and swing up so as to allow the water to pass under, unlike floats which must be anchored in deep water, so that they may not strike the bottom, and must be held against the full force of the waves. Besides, there must be means of holding the pumps to the bottom of the sea and transmitting the power to the shore, which, unlike my motor, "would be enormously expensive."

The motor at Point Lobos was built three years ago, and has been running all the time since, except when injured by rocks thrown down by the explosion of 80,000 pounds of dynamite on board of the schooner Parallel, and when I was making experiments. The waves have never injured it, although it is principally wood, and waves have sometimes come over the pump seven feet deep, and the pump is 26 feet above low water. From my experience I am fully convinced that with my improved wave motors we can supply this city with all the power and salt water that may be required for all purposes at a moderate cost. All engineers are welcome to examine my plans. E. T. STEEN.

San Francisco, Sept. 17, '89.

THE WATCHMAKER.

Electric Clocks and Watches.

Mr. Emil G. Hammer of Brooklyn, N. Y., is the patentee of an electric clock which has novel and peculiar features embodied in its construction that make it noteworthy. The time is indicated by means of revolving disks, bearing the figures denoting the hours and minutes, instead of by hands turning around a dial. There are three dials, the first moving every minute, the second every ten seconds, and the third every hour. This dial apparatus is to be connected through the medium of an electric circuit with a standard regulator, which acts to close and break the circuit once each minute, or any other desired interval of time, thereby transmitting an electric impulse which excites an electro-magnet and causes it to set in motion the mechanism by which the dials are turned.

The figures upon the dial faces appear to the observer at an opening in the face, so as to read in their proper consecutive order, and with the most unmistakable distinctness. This arrangement makes it very valuable for railway depots, offices, etc. One particular advantage of this arrangement is that the time is positively indicated by the figures at the dial openings, no matter if viewed from an oblique position. In ordinary dials, the observer standing much below the dial face will not see the correct range of the index hands, and may be misled several minutes. The actuating mechanism is such as to insure great durability and steadiness of action.

M. L. Hussey of Menlo Park, N. J., has also secured patents for both a watch and a clock to run by electricity. He has organized a company to manufacture his clocks and watches. Mr. Hussey has been 11 years at work on his inventions, and has secured patents on 13 appliances necessary in the manufacture. The peculiarity about timepieces is the gravity movement, which, aided by a small electric current, moves the pendulums of the clocks and the large balance-wheel of the watches. The battery is inclosed in the watchcase, and with it the timepiece will run for a whole year without any attention. In time it is expected that five-year watches and clocks can be manufactured. The new watches and clocks contain only one-third as many parts as the ordinary instrument.

MODERN WATCH DIALS.—Watch dials are now made by photography at a mere fraction of their former cost. They all used to be painted by hand. Now a hundred are made in the time formerly required to produce one, and each of the hundred is better than the one would have been. The dial is of copper, covered with enamel. Upon that they lay a sensitized coating of albumen and bichromate of potash. A large drawing, say 12 inches in diameter, of the design, figures, and dots that it is desired to put upon the dial, is photographed down to the required size, which makes it so very fine that whatever inaccuracies may have been in the drawing are almost beyond discovery by the microscope. The negative thus made is exposed to the light, in contact with the gelatine-coated watch dial, from three to five minutes. Electric light is just as good as sunlight. Where the light has acted, the gelatine is made insoluble. The dial is now inked over with common lithographic transfer ink. Next, with a clean sponge, moistened with a little gum-water, the ink and gelatine are wiped off the dial from all parts except where the light has acted, and to those it adheres, leaving the design in clear black upon the enameled plate. But that design would easily blur and rub off by wear. Another process is necessary to make it permanent. A metallic enamel powder of any color desired — black, blue, red, green, or purple—is dusted upon the dial. It sticks to the inked portions, but nowhere else. Then the dial is put in the muffle and fired. The enamel powder melts into the white enamel base, and the work is complete. The Waltham Watch Co. paid $2000 for that process. By it they can turn out, for ten cents each, dials that in the old way of making would have cost one dollar apiece.

WATCH JEWELS.—You often hear the owner of a valuable watch say that he is afraid to send it to be repaired for fear that the workman might steal the jewels and replace them with common pivots. This is one of the popular fallacies. Watch jewels are practically valueless and it is only the labor of setting them that gives any extra value to a jeweled watch. They are made by machinery from the chips broken off stones in cutting and can be bought at jeweler's supply stores for less than a dollar a dozen. But to get a new jewel put in a watch costs considerable money. Suppose a fine ruby jewel is needed. The watchmaker has to go to the supply store and spend perhaps an hour in hunting among quarts of little stones for one that is the exact size and shape required. When he has found what he wants he will have to pay 25 cents for it, not that it is worth so much, but because the dealer does not care to go to the trouble of setting out all his jewel-boxes for a smaller sum. It will then take the workman a couple of hours to set the jewel in place because he has to take the watch to pieces and clean it before he can put in the jewel. To steal a jewel from a watch would cost a workman more than a dollar's worth of labor, which would be rather a high price to pay for a chip of stone worth eight cents. The common watch jewels are made from chips of garnet, amethyst or topaz, while the best are made from chips of ruby. Sometimes people talk about having a fine mainspring replaced by a cheap one. Such a trick would result in even greater loss to the thief than taking out jewels. Mainsprings are worth about a dollar a dozen. The best American spring made is the Howard and they sell singly for 40 cents.

A CLOCK TO DATE LETTERS.—The electric date and time stamp is the latest thing in inventions. It may be attached to any clock, and in connection with a battery will register the exact time of the day to a minute, and also the day of the month. There is no kind of office business in which this instrument will not be useful as a time and labor-saver, and valuable as a protection against mistakes, disputes and impositions. It may be used to date correspondence without the trouble of referring to a calendar; also to record the time letters or telegrams are received and answered, the time orders are received and filed, goods shipped or bills paid; also to record the time employes start and leave off work, and registering the time watchmen visit the different parts of an establishment. The stamp is operated automatically in synchronism with any clock by means of an electric battery and circuit closer attached to the clock. In addition to the date the stamp may be made to give also the name and business address of the owner or any other words desired, such as "received," "filed," "canceled." —*Jewelers' Weekly.*

HOW TO SPOIL A WATCH.—If you are going out on the electric railway, says the Washington *Post*, you had better leave your $600 chronometer at home, and carry a Waterbury, for there is so much electricity around that it is apt to magnetize your watch. Many people complain that their valuable watches have been rendered useless by riding on the Eckington line. This is something that can hardly be averted. Electricity will escape. It isn't like a bulldog, which can be chained up and tagged. Invisible and imponderable, it makes its way from the wires which conduct it into the very air itself and the delicately constructed steel wheels of a watch catch it up. Then the cogs and pinions are held back by its subtile force until the value of the watch attacked as a timekeeper is destroyed. There are some non-magnetic watches made now which seem proof against such dangers, and non magnetic cases are also put out, which prove equally serviceable. But it is well to observe the precaution not only on the electric railroads, but when near the dynamos of an electric-light plant.

WATCH FACTORIES.—The watch factories in the United States have prospered beyond measure. In achieving their deserved prosperity, the Elgin and other standard corporations have made it possible for every workingman in the country to wear a good timekeeper at a lower price than watches were ever before made for in America. High-priced foreign watches are now principally used in the United States for presentation purposes. The ordinary citizen finds the American brands good enough.

CLOCKS AND WATCHES IN ENGLAND.—During the last ten years a complete revolution has been effected in England by the application of the American machine and factory system to the production of watches. This has been done without depreciating in any way the high character which English horological work has always held, while the prices of English lever watches and chronometers have naturally changed in the face of American and Swiss competition.

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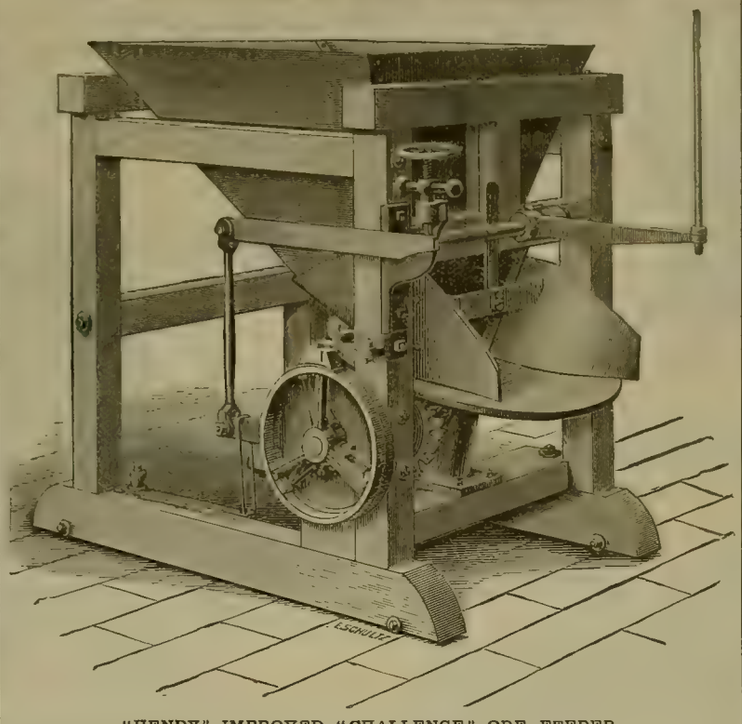
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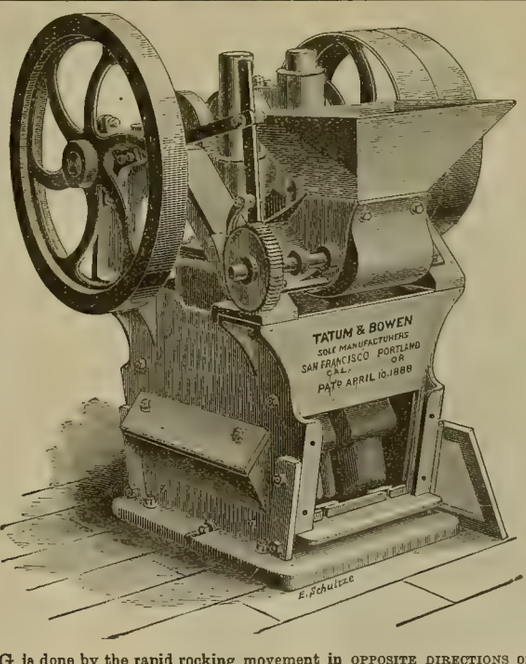


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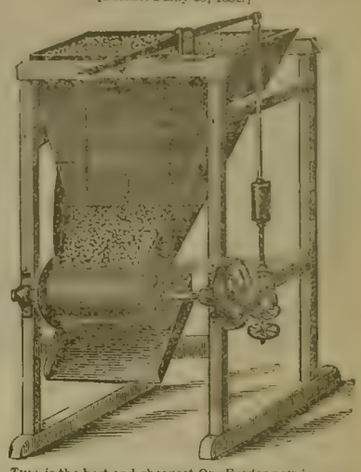
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FOR SALE CHEAP.
One new double circular Sawmill to carry 60-inch bottom saw, with wrought-iron hangers for top saw. Friction feed-works, patent steel screw double-throw head-blocks, with track iron, saw carriage and frame complete.
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FOR SALE.
One 10x13 inch Clayton Belt Air Compressor.
One 3-inch Sergeant Drill.
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One 5½x13 fr. Air Receiver.
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PAYMASTER MINING CO.,
Yuma, Arizona Territory.

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In running order, equipped with large sized Stetefeldt and four reverberatory furnaces in good repair. The property is situated in the midst of an important mining district, in Chihuahua, Mexico, producing large quantities of suitable ores. Excellent opportunity for a custom mill. Present owners wish to dispose of the property, as they are erecting a new mill at their own mines. For particulars address
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Which hold them firmly together.

Each Rivet is Independent
And Follows the Stretch.

THERE ARE NO STITCHES
TO BREAK, and
The Belt has a Smooth Surface.

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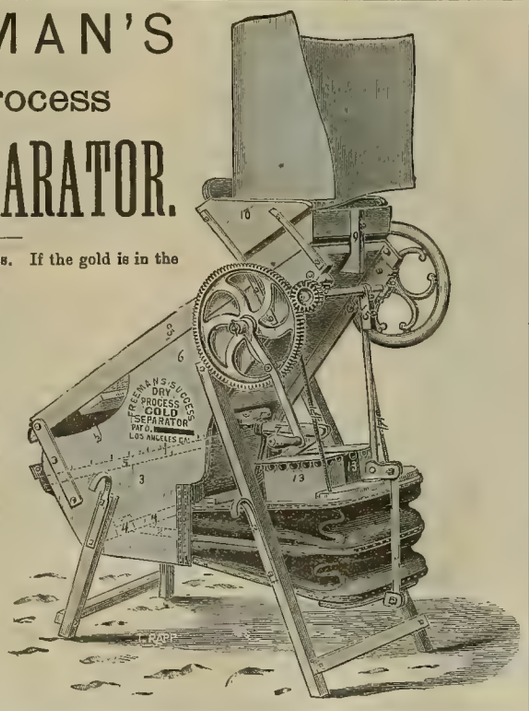
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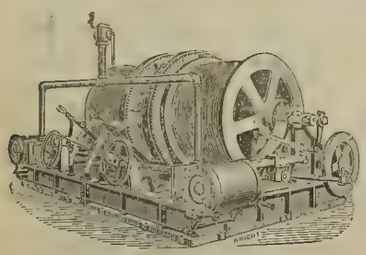
T. J. SCOTT,
Osceola, Nevada.

Smith & Drew took out Tuesday, in their dry wash diggings, in addition to 5 ozs. of fine gold, a nugget weighing 22 ozs. The machine used was Freeman's Dry Process Separator.—*Utah Daily Union, May 10, 1889.*

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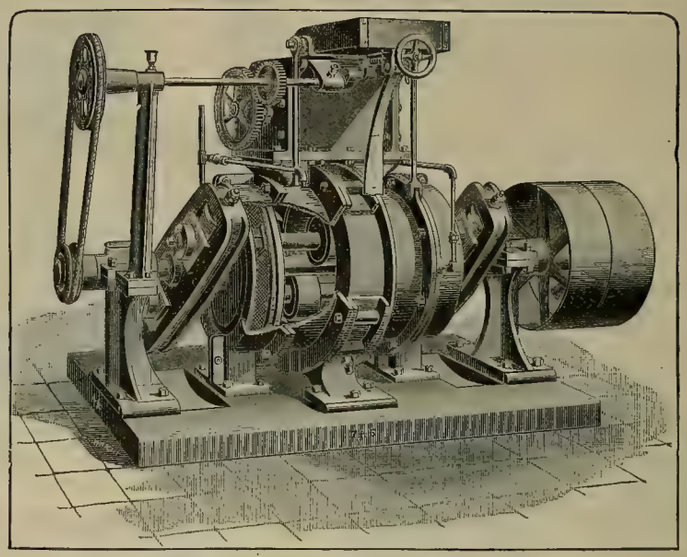
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FRISBEE WET MILL.

This Mill, with a weight of less than 9000 pounds, has a capacity of three tons per hour of hard quartz to 40 mesh; has been thoroughly tested; we guarantee its work as represented, and we will give long time trial.



IT HAS NO MORE WEARING PARTS THAN CORNISH ROLLS,

And renewals will not cost over one-half as much as for stamps. Will run empty, or with small amount of ore without injury. The attention of parties having Cement Gravel is called to this Mill, as it will run 100 tons per day to No. 8 mesh; 30 to 35 H. P.

OUR DRY MILLS are the most economical ever built, and are extensively used with record of several years. No grinding in pans. Mill finishes to any fineness desired.

FRISBEE-LUCOP MILL COMPANY.

GIDEON FRISBEE, Manager, - - 59 & 61 First Street, San Francisco
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WATER POWER TRANSMITTED BY ELECTRICITY

To Run your Mills, Hoists and Trams.

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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

From the official report of U. S. Patents in DEWEY & Co.'s Patent Office Library, 220 Market St., S. F.

FOR WEEK ENDING SEPT. 10, 1889.

410,748.—EXERCISING DEVICE FOR MUSICIANS—E. S. Bonelli, S. F.

410,728.—LATCH—Jos. Brown, Santa Rosa, Cal.

410,578.—FARE REGISTER—H. R. Coffey, Stockton, Cal.

410,885.—REGISTERING MECHANISM—P. Ford, Tucson, A. T.

410,759.—DREDGING MACHINE—W. P. Humphreys, S. F.

410,761.—SOLDERING MACHINE—Livingston & Wilcox, S. F.

410,601.—DRILL CHUCK—E. Moyle, Grass Valley, Cal.

410,767.—FILTER—Orestes Pierce, S. F.

410 940.—SOLUTION OF BENZOIC SULPHIONIDE IN OILS, ETC.—A. Sommer, Berkeley, Cal.

410,812.—TERRET—J. T. Stoll, Sacramento, Cal.

410,775.—CUT-OFF VALVE GEAR—Isaac F. Thompson, S. F.

410,776.—GRAIN SEPARATOR—H. O. Triplett, Orland, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

WATER-FILTER.—Orestes Pierce, S. F. No. 410,767. Dated Sept. 10, 1889. This filter is specially applicable for cleaning water in large quantities and under such conditions as are found necessary for public water-works. Water which is supplied to cities in large quantities from reservoirs often contains much foreign matter held in suspension, which it is desirable to remove before the water is delivered into the distributing pipes, and for this purpose screens of fine muslin may be employed, the water passing through them until the collection of foreign matter necessitates their being taken out and cleaned. If the water is allowed to flow through them with any considerable current the foreign matter becomes forced into the substance of the screen, so that it is difficult to clean it without a brush. In this invention Mr. Pierce interposes a dam or check between the screens and the discharge, of such a hight as to produce nearly dead water in the screen chamber, and the inflow and outflow of the water will be so gentle as to prevent any rush or perceptible current against the screens. It is thus possible to use many successive screens or thicknesses without clogging. The filter is so arranged as to provide a large filtering surface while occupying a very small superficial area, and by the arrangement of the filters the water passes through them with the least possible current, so that the foreign matter may be easily washed from the surface whenever it has collected sufficiently to prevent a free passage of the water. In making this filter the unit is a single cylinder, the surface of which is covered with a filtering material. As many of the cylinders may be set into a single tank or receptacle as desired, or each of them may be set in a separate vessel, as, for instance, a common cask.

EXERCISING DEVICE FOR MUSICIANS.—Eugene S. Bonelli, S. F. No. 410,748. Dated Sept. 10, 1889. This invention relates to certain improvements in devices for exercising and strengthening the muscles of the fingers and wrists of piano-players and musicians. For the purpose of training the muscles which are brought into action in piano-playing, an apparatus has been devised by the use of which the various muscles of the hand and wrist are strengthened systematically for the purpose of improving the technique in piano-playing. This invention is designed to improve this apparatus by providing certain rests for those fingers which are not being used, and adjustments by which the amount of power or pressure brought upon each muscle may be delicately graduated.

CUT-OFF VALVE GEAR FOR ENGINES.—Isaac F. Thompson, S. F. No. 410,775. Dated Sept. 10, 1889. This patent covers improvements in reciprocating piston engines with sliding or piston valves. The whole of the cut-off mechanism is exceedingly simple and sensitive, and its range is from nothing to the full stroke of the piston. A large engine of this pattern has recently been put at work in the Miners and Golden State Iron Works in this city, where it was made. One is also in operation at the Mechanics' Institute Fair, where it is attracting considerable attention. We shall shortly give a detailed illustrated description of this new engine in the PRESS.

SOLDERING MACHINE.—A. W. Livingston and George Wilcox, S. F. No. 410,761. Dated Sept. 10, 1889. This is a machine for soldering the ends of square or rectangular shaped metallic cans. The soldering machine is an automatic one in which an endless carrier-chain, moved by sprocket-wheels and provided with hinged plates, receives the cans to be operated on and carries them along with it through a trough of molten solder, at the same time revolving the cans over and over, thus bringing every side of the end of the can in contact with the molten solder, and finally depositing them on end on a table or conveyor, out of contact with the machine, to cool off.

GRAIN SEPARATOR.—H. O. Triplett, Orland, Cal. No. 410,776. This patent covers certain improvements in apparatus for separating grain from the straw and chaff with which it is mixed when it leaves the thrashing cylinder. In this machine the front end of the shoe is not so heavily loaded with grain and chaff as in the ordinary operation of cleaning, and this admits of a lighter blast through the screen than would otherwise be the case. By reason of a double blast this invention is enabled to distribute and separate the material which is flowing from the grain-carrier, so that none of the grain is blown from the rear end and lost as is often the case. There are several other improvements in this device which can be easily applied to any separator or thrashing machine of the ordinary construction with a little additional change.

Mining Personals.

J. H. Kincaid is superintendent of the North Occidental mine on the Comstock.

Richard De Kuhn is superintendent of the Mocking Bird mine and mill near Prescott, A.T.

J. A. Ferson is superintendent of the Union copper mine, Copperopolis, Calaveras county.

W. B. King of the Owens mine, Julian district, San Diego county, is visiting in Oakland.

Superintendent A. C. Hamilton of the Chollar and Potosi came down to San Francisco last week.

Jesse Prichard of Denver has been employed to take charge of the Grand Tower group of mines at Gold Hill, N. M.

Robt. Beveridge, formerly of the Hope mill, Montana, is now in South America in the employ of Fraser & Chalmers.

James H. Crossman, one of the field assistants of State Mineralogist Irelan, will shortly start on a tour of inspection in San Bernardino county.

A. S. Burt has been elected superintendent of the Eureka Con. mine, Nevada, to fill the vacancy caused by the resignation of Hank Donnelly.

F. Chappellet, who has managed the Dardanelles mine, Placer county, for nearly 13 years so successfully, thinks of taking a needed rest as soon as a man can be found to take his place.

D. D. Bailey, Recorder of Julian district, San Diego county, has appointed Joseph Marke of Julian, and R. G. Melrose of the Gold King mine, deputies.

James D. Hague, president of the North Star Gold Mining Company, of Grass Valley, is authority for the statement that the gross value of the product of the mine in July was $21,219.44, and in August $27,400, and he intimates that another dividend of $50,000 will soon be paid.

H. S. Sherard, formerly superintendent of the Vulture mine in Arizona, has become interested in mining property at Gold Hill, N. M. He has recently returned from Lower California and tells the Silver City *Enterprise* that he objects to mining in that country for the reason that the superintendent is always held personally responsible for all debts or accidents. If the company fails to pay, the superintendent is locked up and held until the funds are forthcoming. While this is hard on the superintendent, it is a splendid protection to the miner.

SILVER-LEAD ORES.—Telegraphic reports received by the Treasury Department from the collectors of customs at El Paso, Laredo and Eagle Pass show that the quantity of silver-lead ores imported since the enforcement of the regulations of July 18th last was 10,898 tons, while the importations for the like period immediately preceding the issuance of such regulations were more than one-half again the volume of importations. The reports also show that the value of the ores imported at Laredo prior to the adoption of the new regulations was much lower than that since imported, indicating that large quantities of low-grade ores formerly permitted to come in free are now excluded.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. C. HOAG—San Francisco.
R. G. BAILEY—San Francisco.
W. W. THEOBALDS—Central California.
GEO. WILSON—Sacramento Co.
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DR. W. F. DRAKE—Sonora, Cal.
FRANK S. CHAPIN—Lassen Co.
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A. F. JEWETT—Tulare Co.
ROBERT M. MAPPES—Fresno Co.
E. L. RICHARDS—San Diego Co.
JULES BAUMANN—Arizona.
H. G. PARSONS—Nevada.
WM. H. HILLEARY—Oregon.
F. C. ROBERTSON—Oregon and Washington.
W. B. FROST—Utah.

THE Portland *Oregonian* says the value of the manufactures of that city for 1889 will be $18,000,000, while the capital invested amounts to $12,000,000.

COKE.—The smelting companies of Eastern Nevada, says the *Enterprise*, should now be able to procure coke at considerable lower rates than in former times when it was necessary to bring that article from the East. They are now producing coke of good quality in Utah, and also in Montana. Some claim that the coke made in Montana is even better than the Eastern article. Cheap coke would bring to the front many mines now languishing in various sections of the eastern part of Nevada.

HYDROMETALLURGY OF SILVER.—Before the Academy of Sciences last Monday evening, Frederick Gutzkow, mining engineer, made an address upon the hydrometallurgy of silver, giving practical working illustrations of what is known as the wet process of treating ores. He dwelt upon the many improvements and discoveries which have been made in this process in the past few years and the great possibilities for the economical extraction of metals which it offers.

INFORMATION has been received that the Grand Prix and gold medal had been awarded at the Paris Exposition to Prof. Rowland of Johns Hopkins University for his photographic map of the solar spectrum and his concave gratings. This is in addition to the Grand Prix and medal awarded to Johns Hopkins University for its publication.

DELINQUENT SALE NOTICE.

Gray Eagle Mining Company—Location of principal place of business, San Francisco, Cal. Location of works, Placer County, Cal.

NOTICE.—There are delinquent upon the following described Stock, on account of assessment (No. 14) levied on the 13th day of August, 1889, the several amounts set opposite the names of the respective shareholders, as follows:

NAMES.	No. Certificate.	No. Shares.	Amt.
Brown, G A	463	100	$ 4 00
" G A, Trustee	464	5,000	200 00
" " "	465	2 500	100 00
Bowers, D	379	20	80
"	404	500	20 00
Bogart, O H, Trustee	436	100	4 00
" "	437	100	4 00
" "	447	5,000	200 00
" "	484	200	8 00
" "	485	200	8 00
Colton, A O, Trustee	243	100	4 00
" "	244	100	4 00
Durning, T G, Trustee	231	410	17 60
Ettlenger, Isaac	137	600	24 00
Francis, H L, Trustee	444	1,500	60 00
Horton, Thos R	51	5,000	200 00
" " Trustee	315	5,000	200 00
Hall, Wm E	131	900	36 00
"	154	1,000	40 00
" Trustee	411	200	8 00
" "	412	200	8 00
Hall H E, Trustee	372	1,000	40 00
Nash, H W	269	104	4 16
Nicol, Duncan, Trustee	462	2,820	112 80
Shankland, Robt	144	600	24 00
Stout, C S, Trustee	422	106	4 24
" "	476	2,000	80 00
" "	477	963	38 12
Stout, Mrs M E	170	500	20 00
" "	183	500	20 00
Searles, W A, Trustee	317	500	20 00
Searles, W A	332	250	10 00
" Trustee	327	500	20 00
Waller, L P F, Trustee	358	100	4 00
" " "	367	3,000	120 00
" " "	458	100	4 00
" " "	459	100	4 00
" " "	460	100	4 00
Wetzel, Theo, Trustee	215	50	2 00
" " "	233	40	1 60
" " "	237	40	1 60
" " "	300	1,000	40 00

And in accordance with law, and an order of the Board of Directors, made on the 13th day of August, 1889, so many shares of each parcel of such Stock as may be necessary, will be sold at public auction, at the office of the Company, 303 California Street, room 11, San Francisco, California, on TUESDAY, THE EIGHTH DAY OF OCTOBER, 1889, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

J. M. BUFFINGTON, Secretary.

Office, 303 California Street, room 11, San Francisco, California.

ASSESSMENT NOTICE.

California & Nevada Railroad Company.—Location of principal place of business, San Francisco, California. Location of Railroad, Alameda County, California.

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 3d day of August, 1889, an assessment, No. 1, of Fifty Cents per share was levied upon the Capital Stock of the corporation, payable immediately in United States Gold Coin to the Secretary at the office of the Company, Room 12, No. 320 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 20th day of September, 1889, will be delinquent and advertised of sale at public auction, and unless payment is made before, will be sold on Monday, October 14th, 1889, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

E. A. PHELPS, Secretary.

Office, Room 12, No. 320 California Street, San Francisco, California.

Books on Assaying.

BY C. H. AARON.

PART I.—Gold and Silver Ores.—Price $1.

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This work is written by an experienced metallurgist who has devoted many years to assaying at leading precious ores on the Pacific side of the American Continent. He writes whereof he knows from personal practice, and in such plain and comprehensive terms that neither the student nor the practical miner can mistake his meaning.

The work, like Mr. Aaron's former publications, "Testing and Working Silver Ores," "Leaching Gold and Silver Ores" that have been "successfully popular" is written in a condensed form, which renders the information more readily available than that of more wordy and less conscientious writers. The want of such a work has long been felt. It will be very desirable in the hands of many.

Table of Contents:

Preface; Introduction; Implements; Assay Balance; Materials; The Assay Office; Preparation of the Ore; Weighing the Charge, Mixing and Charging; Assay Litharge, Systems of the Crucible Assay; Preliminary Assay; Dressing the Crucible Assays; Examples of Dressing; The Melting in Crucibles; Scorification; Cupellation; Weighing the Bead; Parting; Calculating the Assay; Assay of Ore Containing Coarse Metal; Assay of Roasted Ore for Solubility; To Assay a Cupel; Assay by Amalgamation, To Find the Value of a Specimen; Tests for Ores, A Few Special Minerals; Solubility of Metals; Substitutes and Expedients; Assay Tables.

The volume embraces 130 12mo. pages, with illustrations, well bound in cloth; 1889. Price, $1, postpaid. Sold by DEWEY & Co., Publishers, No. 220 Market street, San Francisco.

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Lead, Copper, Tin, Mercury, etc.
Price $1.75.

This book is entitled "Assaying—Parts II and III," and is separate from Part I, and treats of Gold and Silver Bullion, Lead, Copper, Tin, Mercury, Zinc, Nickel, Cobalt, etc.

Table of Contents:

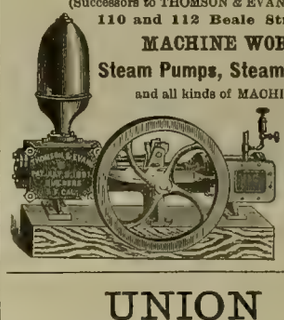
Gold and Silver Bullion; Apparatus; Melting Bullion, Assaying Bullion; Humid Assay of Silver; Manipulation, etc.; Lead Ores; Copper Ores; Volumetric Assays; Parkes' Process; Amalgamation; New Process; Preparation of Potassium Zanthate; Electrolytic Determination of Copper in Ores, etc.; Assaying of Tin Ores; Assaying of Mercury Ores; Assaying of Zinc Ores; Assaying of Zinc Ores, New Method; New Assay of Nickel and Cobalt; Assay of Chromium; Assay of Bismuth; Assay of Arsenic; Assay of Antimony; Assay of Sulphur; Assay of Salt; Appendix to Part I; Notes on Crucible Assays; Weighing by Oscillations; Appendix to Part III; The Assay of Lead; The Assay of Copper.

There are 160 12mo. pages with illustrations in the volume which is bound strongly in cloth. Price postpaid, $1.75 Sold by DEWEY & Co. Publishers, No. 220 Market St., S.F.

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Steam Pumps, Steam Engines

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Manufacture Finest Quality of Plain, Molded and Ornamental PRESSED BRICK and ARCHITECTURAL TERRA COTTA.

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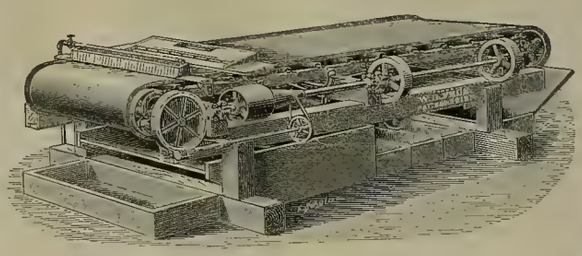
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IMPROVED BELT FRUE ORE CONCENTRATOR,

The Best Ore Concentrator in the market, having double the Capacity and doing its work as close as the plain Belt machine, while its concentrations are clean. It is used in a number of Mills, the most notable of which is the Alaska M. & M. Co's Mill, where 24 Improved Belt Frues are taking the Pulp from 120 Stamps, crushing 350 tons per day, and is giving entire satisfaction as against 48 plain Belt Machines, taking the Pulp from the other 120 Stamps.

Price of Improved Belt Frue Vanner, $900, f. o. b.
Price of Plain Belt Frue Vanner, $575, f. o. b.

For Pamphlets, Testimonials and further information, apply at office.



Protected by Patents December 22, 1874; September 2, 1879; April 27, 1880; March 22, 1881; February 20, 1883; September 18, 1883; July 24, 1888. Patents applied for.

There are Over 2200 Plain Belt Machines now in Use.

THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., Room 15, No. 132 Market Street, San Francisco, Cal.

"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

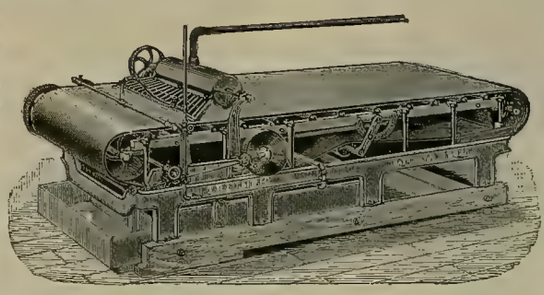
The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

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Price "Triumph" Concentrators, with Improved (Patented) Belt - - - - $650 f. o. b.
Price "Triumph" Concentrators, with Plain Belt - - - - - - - $550 f. o. b.

—o—

We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need be.
Circulars and testimonial letters furnished on application.



JOSHUA HENDY MACHINE WORKS,
39 to 51 Fremont Street, San Francisco, Cal.

(PATENTED.)

Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

—o—

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., NOV. 10, 1885.

Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Emipre Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanner or concentrating devices. DAVID MCKAY, JR.,
[Signed] Sup't North Star and Original Empire Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

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1850. 1888.

—BUILDERS OF—

MINING MACHINERY.

GENERAL OFFICE AND WORKS:
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PLANTS FOR GOLD AND SILVER MILLS, embracing machinery of **LATEST DESIGN** and **MOST IMPROVED** construction. We offer our customers the **BEST RESULTS OF 38 YEARS' EXPERIENCE** in this **SPECIAL LINE** of work, and are **PREPARED** to furnish the **MOST APPROVED** character of **MINING AND REDUCTION MACHINERY,** adapted to all grades of ores and **SUPERIOR** to that of any other make, at the **LOWEST POSSIBLE PRICES.**

We are also prepared to **CONSTRUCT** and **DELIVER** in **COMPLETE RUNNING ORDER,** in any locality, **MILLS, CONCENTRATION WORKS, WATER JACKET SMELTING FURNACES, HOISTING WORKS, PUMPING MACHINERY, ETC., ETC.,** of any **DESIRED CAPACITY.**

THE GATES CRUSHER

Is beyond all question the most important improvement that has ever been made in this class of mining machinery. It will do more than twice the work with a given amount of wear than any other Crusher made, besides crushing so much finer that for mining uses, the capacity of the mill is greatly increased. It has the same relative superiority for macadamizing purposes, affording the cheapest and most reliable machine for this use.

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PACIFIC IRON WORKS,

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For SAVING GOLD!

IN QUARTZ, GRAVEL, OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER

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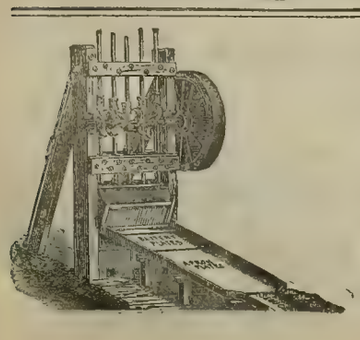
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IMPORTANT TO GOLD MINERS!

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PRICES GREATLY REDUCED.

Only Refined Silver and Best Copper used. Over 3000 Orders filled. Fifteen Medals Awarded. Old Mining Plates can be Replated. Old Plates Bought, or Gold Separated.

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San Francisco Gold, Silver and Nickel Plating Works, 653 & 655 Mission St., San Francisco, Cal., E. G. Denniston, Prop'r.

Our Plates have been used for 20 years. They have proved the best. We adhere strictly to contract in weight of Silver and Copper. **SEND FOR CIRCULAR.**

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Stamp Mills for Wet or Dry Crushing. Huntington Centrifugal Quartz Mill. Drying Cylinders. Amalgamating Pans, Settlers, Agitators and Concentrators. Retorts, Bullion and Ingot Moulds, Conveyors, Elevators, Bruckners and Howell's Improved White's Roasting Furnaces, Etc.

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CONCENTRATING MACHINERY.

Blake, Dodge and Comet Crushers. Cornish Crushing and Finishing Rolls. Hartz Plunger and Collom Jigs. Frue Vanner & Embrey Concentrators, Evans', Calumet, Collom's and Rittenger's Slime Tables. Trommels. Wire Cloth and Punched Plates. Ore Sample Grinders and Heberle Mills.

IMPROVED CORLISS AND SLIDE VALVE STEAM ENGINES. ❋ BOILERS HORIZONTAL, VERTICAL ... AND SECTIONAL....

IMPROVED STEAM STAMPS

Hoisting Engines, Safety Cages, Safety Hooks,

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GENERAL MILL AND MINING SUPPLIES, ETC.

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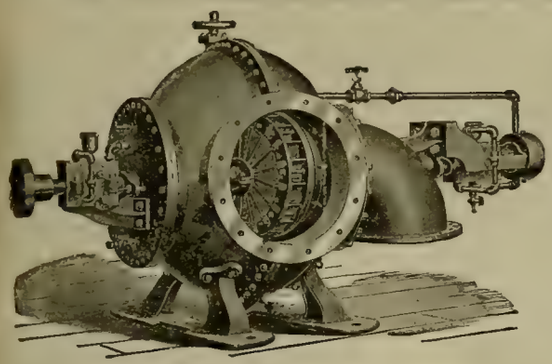
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JAMES LEFFEL'S Mining Turbine Water Wheel.

These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

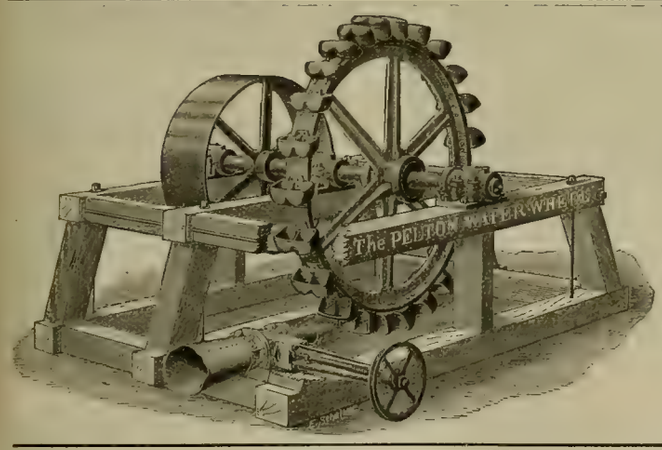
Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

JAMES LEFFEL & CO.,
Springfield, Ohio, or 110 Liberty St., New York.

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PARKE & LACY, General Agents, San Francisco, Cal.



THE PELTON WATER WHEEL

GIVES THE

Highest Efficiency of any Wheel in the World.

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Over 600 in use on the Pacific Coast alone, aggregating upwards of 50,000 Horse Power.

It is not only most economical of water, but the most simple and reliable power for Quartz Mills, Compressors, Hoisting, Pumping, or any other purpose where water power can be used.

ELECTRIC TRANSMISSION.

Power from these Wheels can be transmitted long distances with small loss, and it is now being extensively used in this way in all parts of the country for producing both light and power.

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IMPORTERS AND DEALERS IN

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Sheet Iron and Steel Pipe

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Iron cut, punched and formed, for making pipe on ground. All kinds of Tools supplied for making Pipe. Estimates given. Are prepared for coating all sizes of Pipe with a composition of Coal Tar and Asphaltum.

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Extra sizes and lengths made to order on short notice.

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COIN RETURNS ON ALL BULLION DEPOSITS IN 24 HOURS.
WORKING TESTS OF ORES BY ALL PROCESSES.
SPECIAL ATTENTION PAID TO CONCENTRATION OF ORES.

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GOLD AND SILVER REFINERY And Assay Office.

Highest Prices Paid for Gold, Silver and Lead Ores and Sulphurets.

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Standard Shot-Gun Cartridges,

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ASSAYERS' MATERIALS, MINE AND MILL SUPPLIES,

ALSO CHEMICALS, AND PHYSICAL, SCHOOL AND CHEMICAL APPARATUS.

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We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock o Chemicals.

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price. Our New Illustrated Catalogue, with prices, will be sent on application.

☞ Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England. Also for E. G. DENNISTON'S Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices.

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Nevada Metallurgical Works.

NO. 23 STEVENSON STREET,
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C. A. LUCKHARDT, Manager. ESTABLISHED 1862

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Ores Sampled.
Assaying in all its Branches.
Analyses of Ores, Minerals, Waters, etc.
Working Tests (practical) Made.
Plans and Specifications furnished for th most suitable Process for Working Ores.
Special attention paid to Examinations of Mines; Plans and Reports furnished.

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(Formerly Huhn & Luckhardt,
Mining Engineers and Metallurgists

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Ores Sampled and Assayed, and Tests made by my Process.
Assaying and Analysis of Ores, Minerals and Waters.
Mines Examined and Reported on.
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GREAT REDUCTION!

BATTERY SCREENS.

Best and Cheapest in America.

No imitation, no deception, no planished or rotten iron used. Only genuine Russia iron in Quartz Screens. Planished iron screens at nearly half my former rates.

I have a large supply of Battery Screens on hand suitable for the Huntington and all Stamp Mills, which I will sell at 20 per cent discount.



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For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass. Zinc and other metals punched for all uses.

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Sept. 19, 1889.

There was a slight gain in general trade the past week. The Mechanics' Fair is drawing quite a number of merchants to this city, who take advantage of their visit to buy goods. Iron-workers report more orders and fairly active times. General manufacturers report good orders, which necessitate running on full time. Remittances from the interior are increasing, while the coin going out shows a slight falling off. The amount of gold received from Australia was a little over $500,000, with other shipments to follow. In the local market money is easy, with no particular demand outside of harvest wants. Considerable money is being put out on realty in this city.

MEXICAN DOLLARS—There has been a quiet but good demand for Mexican dollars for shipment by the next outgoing steamer for China. The prices paid ranged from 74¼ to 74½c, according to quality.

SILVER—A strengthening in sterling exchange has imparted a still stronger tone to silver by causing more buying orders. The scarcity of bullion somewhat restricts sales. The mines on this coast appear to have a less output than last year at this time. The prices paid the past week ranged from 93⅜c to 93½c, according to buyers' necessity. The market closed steady at 93⅜@93½c bid.

QUICKSILVER—Receipts the past week aggregate 255 flasks. The market is firm in sympathy with European markets. The demand is light for both home and export. The shipments overland in last month aggregated 83,250 lbs.

BORAX—Shipments overland in last month aggregated 6419 ctls. Shipments the past week aggregate as follows: For Pittsburg, 234 ctls.; New York, 649 ctls.; and Honolulu, 5 ctls. The market is very strong in sympathy with the increased strength at the East and free consumption.

LIME—Receipts the past week aggregate 6282 bbls. The market is unchanged.

CHROME ORE—A shipment of 247,520 lbs. was made to New York the past week. The market is unchanged.

TIN—Exports of plate by sea the past week aggregated 108 lbs. to Honolulu and 7525 to Victoria. The market is very strong, with buyers unable to obtain concessions for either shipment or spot.

COPPER—There was shipped the past week 725 lbs. to Honolulu. The market is reported steadier, with holders having firmer views. Consumers are taking more both in this country and abroad.

IRON—Imports the past week aggregate 100 tons of pig from Irondale. The market for spot parcels of Glengarnock, Eglinton and Clay Line White is quotable higher. The consumptive demand is increasing.

COAL—Imports the past week were as follows: From Port Townsend, 700 tons; Departure bay, 4761; Coos bay, 1470; Australia, 5685. Total, 12,626. The market is stronger and higher for prompt shipment of Australian and Scotch splint. Freights are against buyers. For spot the market is reported very strong at full figures, with dealers and consumers taking quite freely.

Eastern Metal Markets.

By Telegraph.

NEW YORK, Sept. 18, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	42 9-16	93	$10 75	$4 00	$21 50
Friday	42 9-16	93	10 75	4 00	21 30
Saturday	42 9-16	93	10 75	4 00	21 30
Monday	42 9 16	93	10 75	4 00	21 40
Tuesday	42 9-16	93	11 50	3 92½	21 85
Wednesday	42½	92¾	11 00	4 00	21 75

Quicksilver advanced to 70@71c, California. The shape of the copper market is adverse to speculation. Lake quotable at 11c; electro, 10¼c; casting, 10c. Buying is limited to immediate wants. Pig lead inactive, tending lower; $3.90 bid, $4 asked. Tin has been very active, but closes more quiet.

San Francisco Metal Market.

WHOLESALE.
THURSDAY, September 19, 1889.

ANTIMONY	17 @	—
BORAX—Refined, in carload lots	7¼@	7⅝
Powdered " " "	7¼@	
Concentrated " " "	— @	6⅝
All grades jobbing at an advance.		
COPPER—		
Bolt	21 @	22
Sheathing	22 @	24
Ingot, jobbing	15 @	16
do, wholesale	13@	14
Fire Box Sheets	22 @	24
LEAD—Pig	4 1@	—
Bar	5 @	—
Sheet	7 @	—
Pipe	6 @	—
Shot, discount 10% on 500 bags Drop, ℔ bag.	1 45 @	—
Buck, ℔ bag	1 65 @	—
Chilled, do	1 85 @	—
STEEL—English, ℔	16 @	20
Cantou tool	9 @	9½
Black Diamond tool	9 @	9½
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4½@	—
TINPLATE—B. V. steel grade, 14x20, P. S.	4 80 @	—
B. V., steel grade, 14x20, spot	4 85 @	—
Charcoal, 14x20	6 25 @	6 75
do roofing, 14x20	5 12½@	5 25
Pig tin, spot, ℔ lb	21 @	21½
do, do, prompt shipment	— @	—
COKE—Eng., ton, spot, in blk & sks, reptvly	17 00 @	20 00
Do, do, to load	13 00 @	13 25
QUICKSILVER—By the flask	— @	47 50
Flasks, new	@	—
Flasks, old	35 @	—
	Spot.	To Load.
IRON—Clengarnock ton	29 00 @	— —
Eglinton, ton	29 00 @	— —
American Soft, No. 1, ton	— @	31 00
Oregon Pig, ton	— @	30 00
Clay Lane White	— @	26 00
Shotts, No. 1	28 50 @	29 00
Bar Iron (base price) ℔ lb	2¾@	3
Chrome iron ore, ℔ ton	— @	10 00

THE late Prof. Loomis has left $250,000 to the Yale College Observatory.

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$19 00	$16 00
41 to 50 ft	20 00	17 00
51 to 60 ft	22 00	19 00
61 to 70 ft	26 00	22 00
1x3, fencing	21 00	18 00
1x4, "	20 00	17 00
1x3, 1x4 and 1x6, odd lengths	18 00	15 00
Second quality	16 00	14 00
Selected	23 00	21 00
Clear, except for flooring	30 00	27 00
Clear for flooring	1 00	.....
Clear V. G. No. 1 flooring	5 00	.....
Firewood	13 00	9 00
Dressed Pine, flooring, No. 1, 1x6	31 00	28 00
No. 1, 1x4	33 00	29 00
No. 1, 1¼x4, 1¼x6, and odd sizes	36 00	32 00
All sizes, No. 2	26 00	23 00
Stepping, No. 1	43 00	34 00
Stepping, No. 2	33 00	24 00
Ship timber and plank, rough	26 00	17 00
Selected, planed 1 side, av'ge 40 ft	28 00	23 00
" " 2 " " "	30 00	25 00
" " 3 " " "	32 00	27 00
" " 4 " " "	34 00	29 00
Deck plank, rough, average 35 ft	34 00	31 00
Dressed, average 35 feet	39 00	34 50
Pickets, rough, B. M	19 00	15 00
½x1½, 4 ft long, ℬ M	5 50	4 00

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	$ 7½ @ 7½	Cardiff	9 50@10 00
Liverpool Steam	7 50 @ 7 75	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	9 00 @ 9 00	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Gilman	6 00
Scotch Splint	9 00	Seattle	6 00
West Hartley	11 00	Coos Bay	5 00
Greta	8 00	Cannel	10 00
Westminster Brymbo	9 00	Egg, hard	17 50
Nanaimo	9 00	Cumberland, in sacks	19 00
Sydney	8 00	do, bulk	18 00
Jackson	6 00		

Mining Share Market.

Reports are current of an assessment to be levied before long on Alta, Justice, Occidental, Mexican, Union, Sierra Nevada and Belcher. It is quite certain that the first three will have to levy assessments within the next 30 days, notwithstanding their crushing ore. The long-threatened 50-cent assessment on Bodie has not been levied yet, but the secretary of the company expects it any day, for winter supplies have to be laid in soon, and the company will not have $20,000 on hand at the close of this month to meet current expenses and cost of needed supplies. It is reported on the street that the Bodie stock will set back from present prices on an assessment, after which it will do better. The commission brokers report very few outside stocks carried on a margin, and as for that, very few Comstocks on a margin. The street has a deal in the outside stocks to commence in next month. Usually well-informed parties look for lower prices in the Comstocks, to be followed by quite an advance on the short interest and the uncovering of an ore body where and when least expected.

The news from the Comstock mines is now of a bearish character, as it always is when the pool is "freezing out" side holders of stock. From the outside mines our advices report that crosscutting under favorable circumstances will be commenced soon in Crocker, and also that the mill will soon be started up. From the Tuscaroras more favorable advices come to hand, as also from Eureka Consolidated and Silver King. From the Bodies we have nothing new to report.

As has been before announced in these columns, the water in the Gold Hill mines is to be pumped out, pumping to be commenced soon. In Crown Point, Belcher, Yellow Jacket, and extending farther north, a rich and large ore body is known to exist on the level from the 1200-foot down to about the 1800-foot level, but on the 2700-foot level there is nothing in Crown Point but a small but rich streak, the daily papers to the contrary. Work by the Comstock Tunnel Company looking to an extension of the tunnel west through the Savage mine will be commenced soon. Crushing of ore by the Belcher and Overman will be commenced in next month, and several of the other mines soon afterward, while Yellow Jacket will increase the ore milled double that now crushed.

Official letters received to-day (Thursday) from Bodie and Mono report that the lower levels are to be abandoned and explorations be made in the upper levels. From Crown Point the assays of ore are reported officially largely increased, being more than twice as high as the preceding week's assay. A west crosscut on the 300-foot Con. Imperial level is in 26 feet. This crosscut is considered very important. Official advices from the other Gold Hill mines are of a more encouraging character.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, department 10, San Francisco:

PACIFIC COAST POWER CO., Sept. 14. Object, to erect and maintain pumping works and electrical plants and to sell water and electricity. Capital stock, $5,000,000. Directors—John J. Haley, J. William Lucas, J. J. Clarke, E. T. Steen, William H. Birch, F. A. Huntington and C. E. K. Royce.

GUTTER-SWEEPING MACHINE CO., Sept. 18. Capital stock, $100,000. Directors—Louis Metzger, A. E. Ball, E. A. Newland, J. R. Fritz and S. F. McDill.

CLEAR CREEK G. M. CO., Sept. 13. Capital stock, $1,500,000. Directors—C. L. Doebelin, E. A. Sparks, J. J. Atherton, Isaac Alwood, A. J. Angell, T. C. Thorm, V. G. Hush, O. J. Johnson and Geo. Jones.

THE draining of the Crown Point and Belcher down to the 2000 level will be the next movement of importance in the Gold Hill mines. The water is now flooding the 1700-level of those mines, where extensive ore reserves are located.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Best & Belcher M Co	Nevada	44.	25.	Sept 11.	Oct 15.	Nov 6.	L Osborn	309 Montgomery St
Bulwer Con M Co	California	6.	25.	Aug 6.	Sept 12.	Oct 10.	L Osborn	309 Montgomery St
Calaveras Blue Gravel M Co	Cal.	3.	3.	Aug 3.	Sept 16.	Oct 2.	B Burris	240 Montgomery St
Challenge Con M Co	Nevada	5.	50.	Aug 6.	Sept 9.	Sept 30.	C L McCoy	328 Pine St
Chicago M & M Co	California	2.	15.	Sept 13.	Oct 18.	Nov 4.	W Grant	520 Montgomery St
Crown Point M Co	Nevada	52.	50.	Sept 18.	Oct 21.	Nov 11.	J Newlands	329 Pine St
Con New York M Co	Nevada	1.	25.	Aug 14.	Sept 18.	Oct 9.	C E Elliott	309 Montgomery St
Del Norte Gravel M Co	California	2.	7.	Aug 24.	Oct 3.	Oct 26.	J B Cronan	230 Montgomery St
East Sierra Nevada M Co	Nevada	1.	10.	Aug 8.	Sept 13.	Oct 7.	G R Spinney	310 Pine St
Gray Eagle M Co	California	14.	4.	Aug 13.	Sept 16.	Oct 8.	O H Bogart	317 Pine St
Keyes M Co	Nevada	4.	30.	Aug 27.	Oct 1.	Oct 21.	J H Sayre	328 Montgomery St
Mineral King M & M Co	Arizona	3.	10.	Aug 22.	Sept 24.	Oct 21.	P H Leonard	419 California St
Mono M Co	California	28.	50.	July 24.	Aug 28.	Oct 1.	B L Burling	309 Montgomery St
North Belle Isle M Co	Nevada	16.	20.	Sept 18.	Oct 22.	Nov 13.	J W Pew	310 Pine St
Potosi M Co	Nevada	33.	50.	Sept 18.	Oct 22.	Nov 12.	C E Elliott	309 Montgomery St
Peer M Co	Arizona	8.	10.	Sept 4.	Oct 10.	Nov 5.	A Waterman	309 Montgomery St
Palesade S M Co	Nevada	1.	10.	Aug 6.	Sept 16.	Oct 2.	D Buck	309 Montgomery St
Scorpion M Co	Nevada	1.	10.	Aug 8.	Sept 13.	Oct 7.	G R Spinney	310 Pine St
Scott Bar M & M Co	California	3.	10.	Sept 10.	Oct 12.	Oct 31.	H Pink	309 Montgomery St
Southern Cal Coal & Clay Co	Cal.	2.	10	30.	Aug 16.	Sept 16.	Oct 16.	W G Mugan	10 California St
True Con M Co	California	7.	2½	Aug 31.	Oct 12.	Nov 16.	J C Bates	434 California St

MEETINGS TO BE HELD.

NAME OF COMPANY	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING	DATE
Golden Fleece Gravel M Co	California	W J Gleason	Phelan Block	Annual	Sept 25
Presidio M Co	California	L Osborn	309 Montgomery St	Annual	Oct 7

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Caledonia M Co	Nevada	A S Cheminant	328 Montgomery St	08	Aug 5
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	Sept 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	Aug 25
Idaho M Co	California		Grass Valley	7.50	Sept 5
Navajo M Co	California	J W Pew	310 Pine St	10	Apr 1
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Sept 10

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 31.		WEEK ENDING Sept. 4.		WEEK ENDING Sept. 11.		WEEK ENDING Sept. 18.	
Alpha	1.25	1.35	1.35	1.60	1.25	1.40	1.30	1.50
Alta	1.25	1.50	1.40	1.65	1.50	2.00	1.90	2.00
Andes	.70	.80	.70	.80	.70	.70	.70	.75
Argenta	.35	....	....	....	....	....	....	....
Belcher	2.90	3.10	2.90	3.40	2.80	3.00	2.80	3.10
Best & Belcher	3.60	4.00	3.60	4.00	3.40	3.75	3.35	3.65
Bullion	.65	.70	.65	.85	.60	.70	.60	.65
Baltimore	.30	....	.25	.30	....	....	....	....
Belle Isle	....	....	....	....	....	....	.15	.15
Bodie Con	.85	.95	.90	1.00	.90	1.00	.75	.85
Benton	....	....	....	....	....	....	....	....
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.10	.15	.10	.15	.30	.35	.30	.30
Commonwealth	2.50	2.60	2.50	2.50	2.50	3.25	3.20	3.25
Con. Va. & Cal	72	77	72	8	7½	72	6⅝	7⅝
Challenge	2.00	2.20	2.00	2.50	2.00	3.40	2.80	3.50
Chollar	1.95	2.20	2.15	2.55	2.00	2.20	1.85	2.30
Confidence	6.50	....	6¼	62	6¼	6⅜	....	....
Con. Imperial	.50	.55	.50	.55	.45	.50	3.45	.50
Caledonia	.25	....	.25	.30	.30	.30	....	....
Con. Pacific	....	....	....	....	....	....	....	....
Crown Point	2.90	3.35	3.00	3.50	2.90	3.30	2.74	3.30
Crocker	.35	.45	.45	.60	.55	.60	.45	.60
Central	....	....	....	....	....	....	....	....
Dudley	....	....	....	....	....	....	....	....
Eureka Con	1.40	2.75	....	....	....	....	2.25	2.25
Exchequer	....	.65	.65	.80	.60	.65	.60	.70
Grand Prize	....	.65	....	....	.65	.80	.75	.80
Gould & Curry	2.00	2.20	2.15	2.60	2.05	2.20	1.95	2.30
Hale & Norcross	2.95	3.20	3.20	3.80	3.10	3.20	3.00	3.45
Holmes	.50	.60	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Iowa	....	....	....	....	....	....	....	....
Julia	.30	....	....	....	....	....	....	....
Justice	1.40	2.00	1.60	2.00	1.60	1.85	1.70	1.85
Kentuck	.90	.95	1.25	1.50	1.20	1.25	1.10	1.25
Lady Wash	....	....	.35	.40	.40	.45	.40	.45
Locomotive	....	....	....	....	....	....	....	....
Mono	.55	1.10	.90	1.50	.95	1.00	.75	.80
Mexican	3.40	4.40	4.25	5 00	3.60	4.20	3.70	4.45
Mt Diablo	....	....	....	....	....	....	....	....
Navajo	.25	....	....	....	.35	.40	.35	.40
North Belle Isle	....	....	.75	.80	.80	.90	.80	.90
New Queen	.70	.75	.60	.70	.65	.85	.80	.85
Occidental	1.35	1.95	1.80	1.90	1.55	1.75	1.70	1.75
Ophir	4.85	5.25	4.80	5⅜	4.50	4 80	4.45	6¼
Overman	.75	1.20	....	1.40	1.15	1.25	1.15	1.30
Potosi	1.50	....	1.60	1.90	1.50	1.55	1.40	1.70
Peerless	.30	.35	.35	.45	.40	.40	.35	.35
Peer	....	....	.20	.30	.15	.20	.10	.15
P. Sheridan	....	....	....	....	....	....	....	....
Silver Star	....	....	....	....	....	....	....	....
Savage	2.10	2.25	2.35	2.85	2.15	2.40	2.20	2.60
S. B. & M	1.80	1.90	1.80	1 05	1.65	1.80	1.80	1.95
Sierra Nevada	2.60	3.10	2.90	3.50	2.75	3.00	2.60	3.05
Silver Hill	....	....	.45	.55	.40	.45	.45	.45
Silver King	....	....	....	....	....	....	....	....
Scorpion	....	....	.15	.20	.15	.15	.20	.30
St. Louis	....	....	....	....	....	....	.35	.35
Syndicate	....	....	....	....	....	....	....	....
Union Con	3.25	3.95	3.30	4.20	2.80	3.30	2.90	3.45
Utah	1.05	1.20	1.10	1.30	1.05	1.15	1.00	1.20
Weldon	....	....	....	....	....	....	.20	.25
Yellow Jacket	3.00	3.30	3.25	3.50	3.15	3.40	3.20	3.45
	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY, Sept. 17, 9:30 A. M.

		100 Gould & Curry	2.00
		50 Hale & Nor	3.05
100 Alta	1.95	225 Mexican	3.95
50 Best & B	3.35	100 New Queen	70c
100 Bodie	70c	100 New York	45c
100 Bullion	65c	020 Ophir	4.55
50 Challenge	2.95	710 Potosi	1.40
100 Chollar	1.90	300 Savage	2.20
235 Con Va & Cal	7.75	150 Sierra Nevada	2.75
500 Con Imperial	45c	100 Utah	1.00
100 Eureka Con	2.40	300 W Comstock	30c

Complimentary Samples.

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Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Hanauer, Sept. 11, $5350; 12, $4960; Queen of the Hills, 13, $1025; Hanauer, 15, $3750; Cons. California and Virginia, 14, $10,853; Hanauer, 17, $10,700; Mt. Diablo, 13, $8472.

LAST week's ore yield of Comstock mines aggregated 3903 tons, divided as follows: Con. Cal. and Virginia, 2695 tons, assay value $28.20 per ton; Occidental, 350 tons, assay value $17.10; Justice, 238 tons, assay value, $23 58; Alta, 220 tons; Yellow Jacket, 400 tons. The bullion yield of the above was about $95,000.

EUREKA CONSOLIDATED.—An official statement issued by the Eureka Con. Mining Co. sets forth the company's assets as exceeding the liabilities by $57 381 91. These assets consist of ore valued at $32,000, bullion valued at $11,000, coke, charcoal and other supplies valued at $28,000, and sundry other items. Bullion is now being produced with one furnace, at the rate of about $11,000 per week, which is netting the company a profit of about $10,000 per month. The reduction works, which were destroyed by fire several months ago, have been replaced at a cost not exceeding $12,000. Several new developments of ore have been made in the mine.

Successful Patent Solicitors.

As Dewey & Co. have been in the patent soliciting business on this Coast now for so many years, the firm's name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific Coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this Coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That this is understood and appreciated, is evidenced by the number of patents issued through their SCIENTIFIC PRESS Patent Agency (S. F.) from week to week and year to year.

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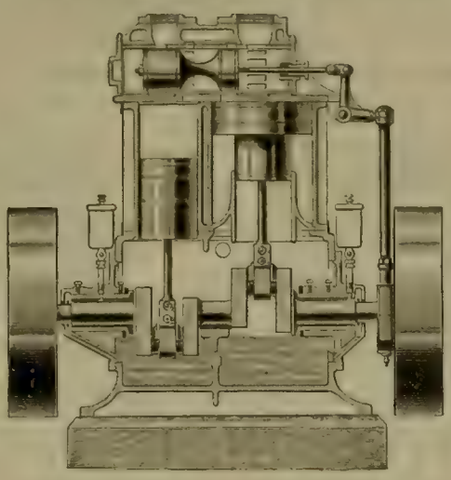
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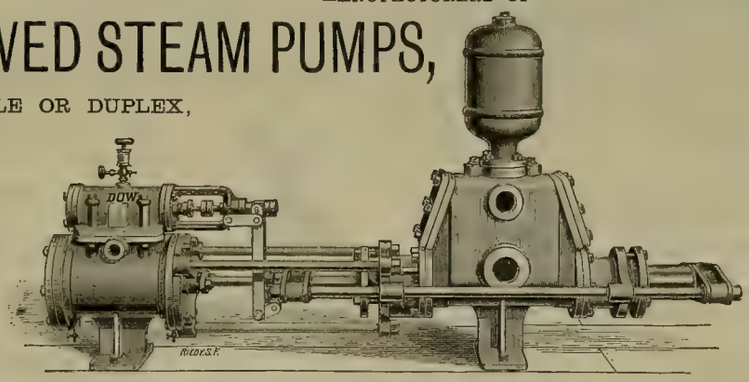
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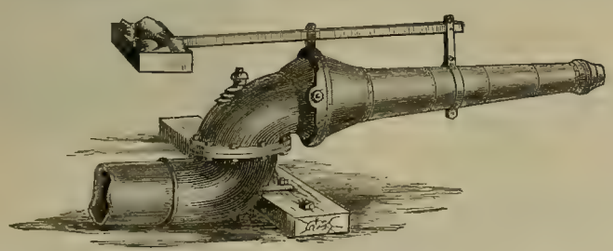


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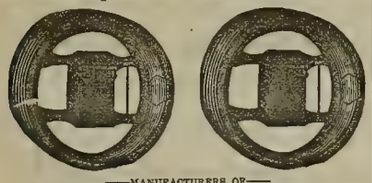
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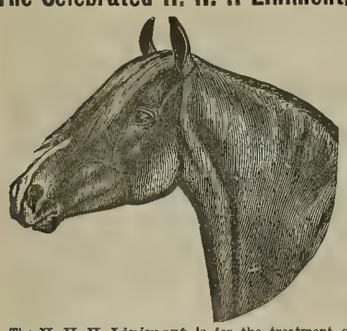
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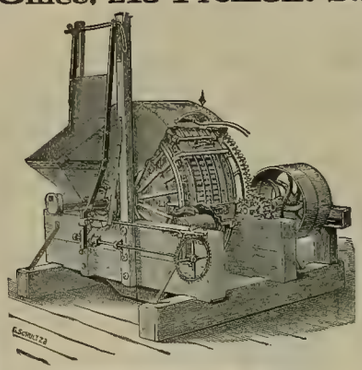
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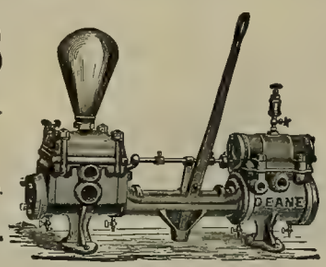
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COAL MINES OF THE WESTERN COAST.

A few copies of this work, the only one ever published treating of Pacific Coast Coal Mining, have been obtained, and are for sale at this office for $2.50 per copy. It was written by W. A. Goodyear, Mining and Civil Engineer, formerly of the California State Geological Survey.

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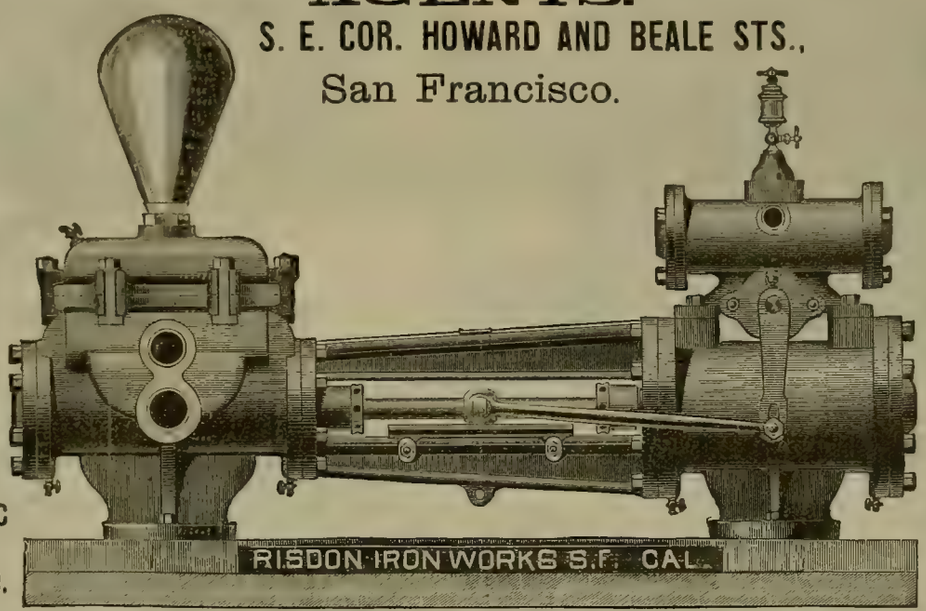
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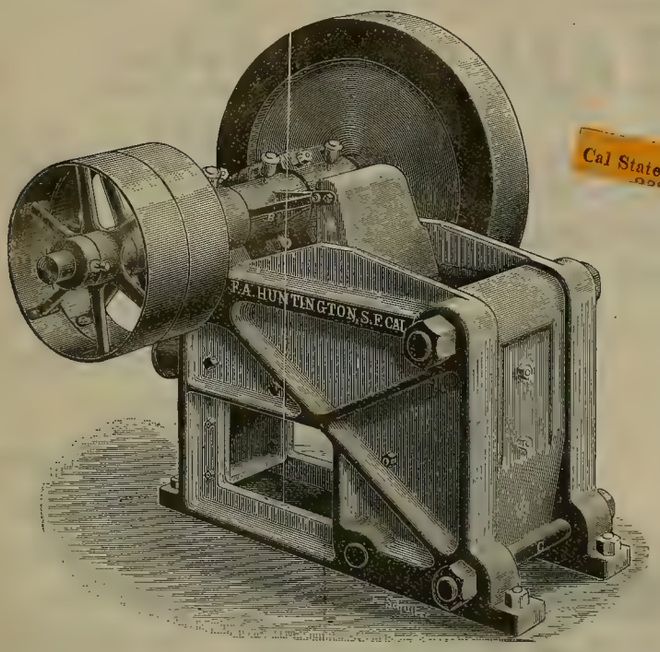
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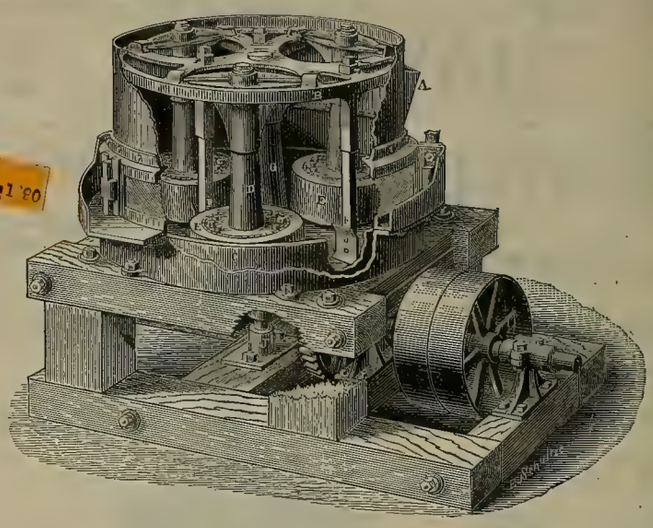


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Huntington's Improved Rock-Breaker.

The main features of this machine are strength, ease of adjustment and simplicity of construction.

The movable jaw *A* is worked by the eccentric *B* and is pivoted at the bottom. The stationary jaw *D* is secured at the top by a bolt running through it, and at the bottom bears against the heavy bolt *C*. The main wear is, of course, at the bottom of a breaker of this form, and the wear is easily taken up by inserting a plate between the bolt *C* and the jaw *D*. The jaw is thus swung in at the bottom, and the opening where the ore passes through is made correspondingly smaller. As will be seen by the cut, this machine is of very simple construction and is strong and durable.



F. A. HUNTINGTON'S
Centrifugal Roller Quartz Mill.

The following will explain the above cut:

The ore and water being fed into the mill at the hopper *A*, the rotating rollers and scrapers throw the ore against the ring die, where it is crushed to any desired fineness by the centrifugal force of the rollers as they roll over it.

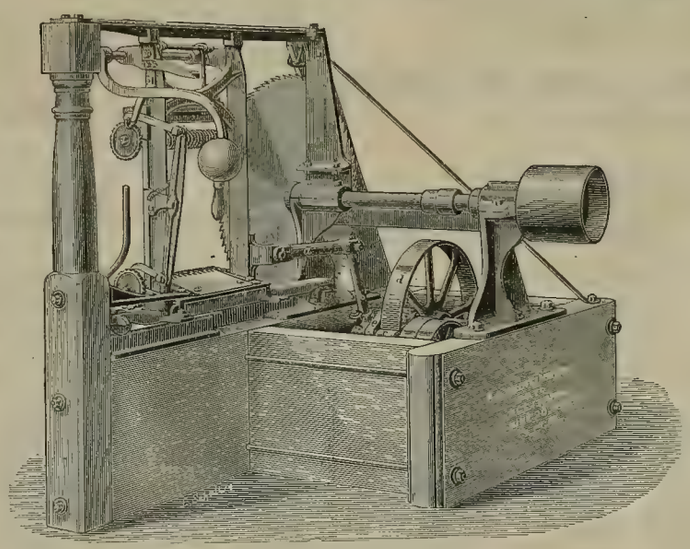
The water and pulverized ore are thrown against and through the screens when fine enough. The discharge is so perfect that it makes little or no slimes, and leaves the pulp in good condition for concentration. The rollers are suspended, leaving a space of one inch between them and the bottom of the mill, thus allowing them to pass freely over the quicksilver and amalgam without grinding it or throwing it from the mill, while it agitates it sufficiently to make amalgamation perfect. For wet crushing and gold saving it has no equal.

I claim especial merit in that feature of this system *which prevents* ALL FLOURING of gold and quicksilver, and the consequent loss of gold that attends stamp milling.

For the economical working of ore that contains sulphurets, I particularly claim the adaption of this mill. The rotary method of crushing the ore so granulates the pulp (which is discharged the moment it is crushed) that a complete concentration of sulphurets is rendered most easy.

F. A. HUNTINGTON'S
PATENT SHINGLE MACHINE.

This Machine is so well and favorably known by all the principal Lumbermen on the Pacific Coast that it is useless to go into any detailed account of its merits; suffice it to say that recent improvements in a new, quick return feed-works has placed it far ahead of all competitors. This feed-works is positive and uniform in its action and obviates all the jar or tremor formerly given to the machine by the weight used in the old style feed.



For simplicity, durability and rapidity of action, these machines have no equal, cutting from 50,000 to 75,500 shingles per day.

Price, complete with Jointer and one 38-inch Saw, $475.00.

The new feed-works can be applied to any of the old machines.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LIX—Number 12
DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, SEPTEMBER 28, 1889.

Three Dollars per Annum,
Single Copies, 10 Cts.

An Improved 60-Inch Gang Edger.

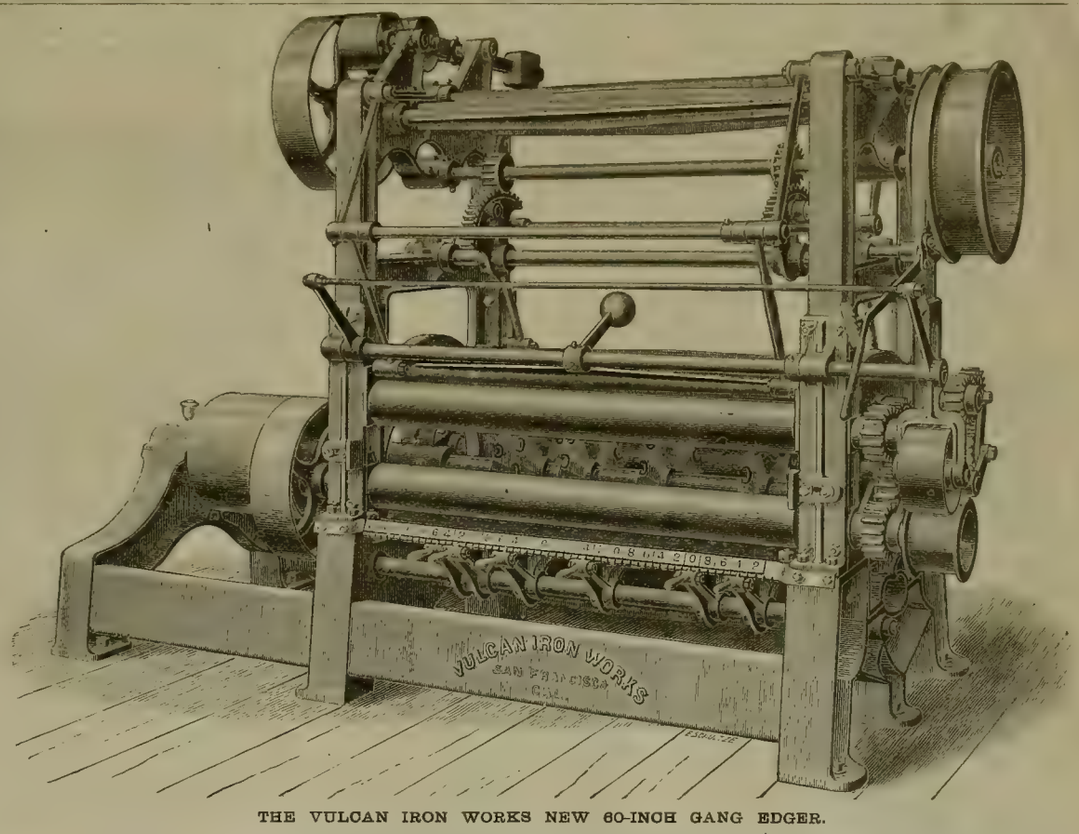
The accompanying engraving represents the new 60-inch gang edger, made by the Vulcan Iron Works of this city. These works have for some years made a specialty of first-class sawmill machinery, and have fitted out many of the largest sawmills on this coast. This new gang edger is just being patented through the Mining and Scientific Press Patent Agency. It is a very heavy machine, and the latest designed in the market, having several valuable improvements over the machines of other makers.

The arbor has three bearings on the frame, all running in patent self-oiling boxes, extra long, lined with genuine babbitt, and bored out on frame, thus making a perfect running arbor, which will not heat. The arbor is 10 feet 8 inches over all, is 4 inches diameter, made of select machinery steel, and is warranted practically true.

The driving pulley is 20 inches by 20 inches solid center, turned inside and out, and the greatest care is taken to have this pulley perfectly balanced.

The saw collars are made of cast iron with phosphor bronze clamp nut to prevent corrosion, and run on two machine tool steel feathers, planed true so that the collars may be put on the arbor either way and the machine changed from right to left or vice versa at any time.

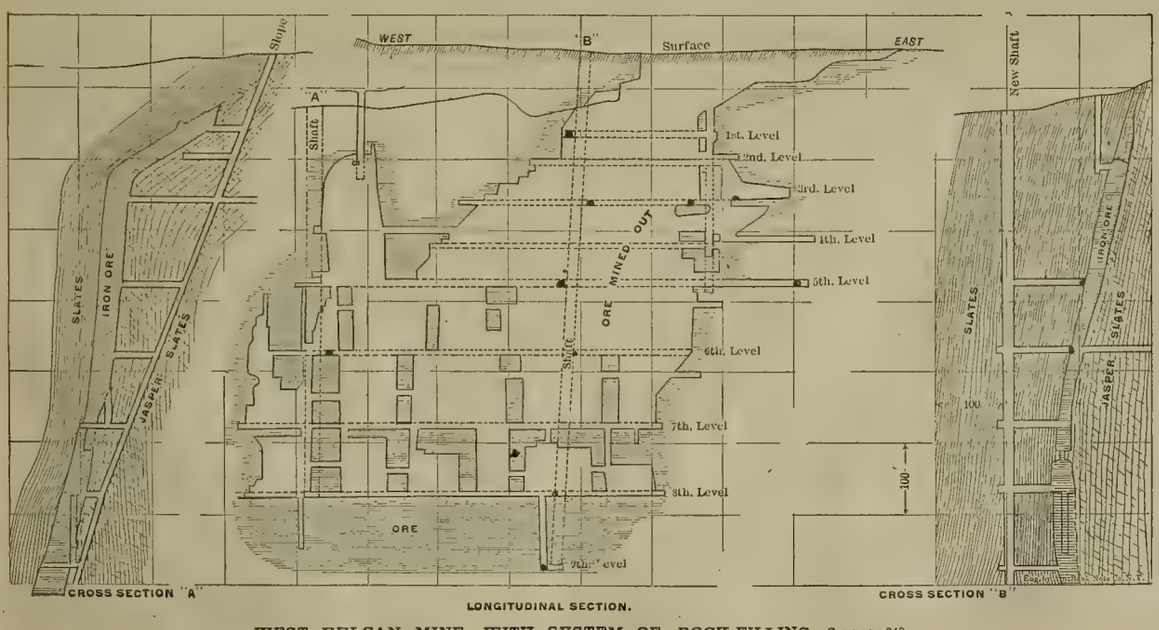
The handles for moving the saws are plain steel handles, and have no spring, catch, or other trigger, to hold the saws in place, and when the saws are in the desired position, the handles drop into a notch in the figure bar, and are held rigidly. The connection between the saw and handle is made with a hinge so that the saw-shipper may be lifted up and every collar removed from the arbor in a few minutes. With this convenience of changing there is no excuse for running dull saws. The machine carries six 24-inch saws, and is warranted to work cants eight inches thick.



THE VULCAN IRON WORKS NEW 60-INCH GANG EDGER.

The feed works are strong and powerful and are all mounted on the frame, thus insuring perfect alignment of the pulleys and belts. There are no short belts to slip or give out from being run too tight and no cross-belts on the machine. The feed-belt has a tightener, which acts automatically, and the tightener for raising the rolls is always within reach of the edger-man. There is a brake attachment to the roll-lifter, so that the rolls may be held at any desired position for a series of cants at the will of the edger-man.

The feed can be varied also at any moment by the operator, which is almost invaluable for heavy cuts and tough timber. There are no discs for feed gear to wear out, no friction pulleys to replace, no counter-shaft to put up in the top of the mill or elsewhere, and there is not a spring of any kind on this machine. It is made of the very best of material and the whole machine is self-contained, as the cut will plainly show. One of these machines has recently been shipped by the Vulcan Iron Works to the Sanhedrin mill, Elk Creek, Colusa county.



CROSS SECTION "A" LONGITUDINAL SECTION. CROSS SECTION "B"

WEST VULCAN MINE, WITH SYSTEM OF ROCK-FILLING.—See page 248.

The Grand Prize.—At the annual meeting of the Grand Prize M. Co. it was shown that the receipts during the year amounted to $128,782 02, made up as follows: Assessment, $84,263.90; Grand Prize ore reduced, $12,165.53; concentrating ore from other mines, $1937.46; overdraft on Sept. 1, 1889, $30,415.13. The disbursements consisted of an overdraft of September, 1888, for $20,021.66, and money paid out for working expenses, $108,760.36. The following officers were elected to serve during the ensuing 12 months: J. E. Dixon, President; Thomas Cole, Vice-President; R. Grayson, Secretary; J. W. Grayson, Treasurer; H. Zadig, William Bowers, Archibald Borland, Directors, and H. W. Coffin, Superintendent.

The changes to the concentrating plant of the Commonwealth Mining Company at Tuscarora will be completed during the first half of October, and the work of ore production will then be resumed.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

San Francisco to Alaska.

(*Concluded.*)

[Written for the PRESS by GRACE STEWART.]

After four days' sailing the ship dropped anchor in Loring harbor, a town which consisted of a cannery and several Indian houses. The small boats were lowered to convey those who wished to go ashore; some went rowing, others roamed about on land, gathering ferns and flowers, while the majority were getting their fishing-lines ready for an evening's sport. It was not long before the fish were hauled in by scores. No sooner would you throw out your line than you would have to draw it in again. Some got tired of fishing for one at a time, so put two hooks on the line. One passenger got excited—it was not a woman this time—put three hooks on and then had all he could do. Think of catching three fish at a time, one on each hook. Some did not think it worth while to bring up one, but would wait for the second or third. They were mackerel, different from those in the East, measuring from 12 to 21 inches. We were told of those wonderful fish that were so eager to be caught, and one Eastern gentleman shook his head and laughed scornfully, but when he saw for himself that it was no fish story, just the actual truth, he said, "Well, I'll have to believe it now, but I'll be switched before I'll tell it east of St. Paul."

We could not realize that it was half-past ten when the anchor was lifted, for it was as light as it is half an hour after sundown in California. The next forenoon was spent at

Fort Wrangel.

The objects of most interest there are the totem poles in front of the Indian houses; only the rich erect these poles, as some cost a thousand dollars or more. They are tall cedar poles with carved faces of men and beasts, in the most horrible forms, representing the generations of the family; the eagle is the great emblem of the mother. Some of these poles are nearly 50 feet high.

The Indian houses are rude, square buildings with immense round timbers supporting the roof. They build their fires in the center of the room, and the smoke issues through a square hole in the roof. Several families live in one house. We went into many of these homes where their wares were displayed. Over the graves of some of the dead are large log-boxes 20 feet high or more. On one is a life-sized whale and another a bear, both carved from trees. The totem poles and graves have been standing for many, many years, the moss growing on them several inches high. The Stikeen river empties into the salt water near this place.

We soon came into Wrangel Narrows, and for 30 miles we are again locked in by high perpendicular mountains covered with forest trees. Here three glaciers are seen at one time, the largest measuring four miles across the front and extending back 40 miles. All the passengers on board rushed for their field glasses to gaze more plainly on, perhaps, their first river of ice. More glaciers were seen farther on, also a high projecting peak called the "Devil's Thumb." On the 21st of June we landed at Juneau. As it was raining and very wet under foot, we did not venture beyond the numerous stores filled with curios. Indian baskets of all shapes and sizes, carved images of slate and wood, miniature totem poles and canoes, furs of all kinds, etc., can be found in these stores, which are kept by Americans.

At 7:30 in the evening we left that city for the

Mines on Douglas Island,

Three miles distant. Although the rain came down in torrents, we picked our way up a short, steep hill to the Treadwell mine. The vein of ore is 464 feet wide and extends along the mountain three-quarters of a mile. It is now being worked from the surface down 250 feet, and below that point a train of cars conveys the ore a few hundred feet through a tunnel into the fourth story of the mill, which is of 240 stamps and crushes 600 tons of ore every 24 hours. The rock averages $7 per ton, and the mill is the largest in the world. The guide went ahead with a candle among that wild and clashing machinery which nearly deafened us. It was useless to try to talk to each other, for if one screamed as loud as he could, he could not hear his own voice. We were taken from top to bottom and had the different parts explained by signs and motions. We looked down into the mine 250 feet where the Burleigh drills were at work. From 25 to 30 blasts are set off every morning, noon and night, and sound like so many reports from a cannon which re-echo against the hills. We gathered some very delicate wild flowers and ferns and returned to the boat about 10:30. Even at that late hour it was far from being dusk. As it was the longest day of the year, some of the ship's passengers sat up all night and could see plainly to read fine print or write, on deck, at any moment, although it was cloudy. We did not leave Douglas Island till the next day at noon, so had ample time to take a stroll about the town.

The Indians.

Down by the water's edge is a long row of Indian houses; some were the worst and most forlorn-looking places we saw anywhere. We were dressed in winter clothing, but the natives do not seem to mind the cold. The little children were out in the rain with scarcely anything on them, sometimes nothing but a shirt. Many of the men and nearly all of the women go barefoot; the majority of the men wear citizens' clothes, while the women wear calico dresses with heavy, bright-colored striped blankets around them and black, yellow or red silk handkerchiefs tied over their heads; their features resemble the Japanese. They keep their babies tied up in little willow baskets, or put them in a small hammock made by tying a rope to each corner of a little blanket. In most of the towns the men take care of the babies while the women sell their curios. They always keep their silver bracelets on their arms and the rings on their fingers; their favorite position for resting is to kneel down and put their head in their hands. There are many cripples; pneumonia and consumption are frequent diseases among them; there are more drunken women than men. It is quite common to see the old women and some of the children with their faces blackened, which makes them very hideous and frightful to look at. It is hard to tell why they do this; some say it is to preserve their complexion, others, a sign of gladness or sorrow. Some wear nose rings and lip rings; when a long, flat-headed silver pin, an inch in length, is thrust through the lower lip, it signifies that the girl has reached the right age for marriage; after the marriage, the silver pin is taken out and an ivory button put in its place, sometimes an inch across.

The scenery about Chilcat and Pyramid Harbor, our most northern point, 59 degrees 11 minutes north, made us feel that we were certainly nearing the Arctic regions, many, many miles from home. At the former place is where the highly-prized Chilcat blankets are made that sell from $15 to $75 each; they are woven from the long fleece of the mountain goat and average one yard in width and about two yards in length; the lower edge has a deep border of fringe. The colors are principally black, white and yellow, covered with sea-mosses and plants. Pyramid Harbor is rightly named from the lofty peaks that rise above all others. We were then within 15 miles of the headwaters of the Yukon river and about 200 miles in the northeasterly direction from Mt. St. Elias, the highest peak in North America, 19,500 feet. The summit is covered with eternal snow and has never been explored more than half its hight. At both these places there are large salmon canneries, but none were yet open, as the salmon were late in running this season. It is not uncommon there to see bears roaming about upon the steep hillside in the bright sunshine.

The Glaciers and Icebergs.

We were continually watching snow-clad mountains and glaciers until we reached Glacier bay, where something of even more interest took our eye. There was a shout and a cry of many "Ohs!" when the first floating ice was seen; it was not long before we were in the midst of it. Ice of the smallest size, up to five and ten feet in diameter, came floating along while our ship was turning to all points of the compass to keep out of its way. We at last anchored in front of a small cannery, that looked as though it was lost in so far off a place. About 2 o'clock in the night, although it was nearly as light as day, the anchor was drawn up, and we again plodded through the water—northward—among those dangerous-looking icebergs. Those the day before were babies beside what we were then passing. The passengers were early risers that morning. All kept running from the bow of the boat to each side, to watch the huge cakes come bumping and cracking against the front of the boat, then swinging to one side, or making a straight line for the paddle-wheels, which could make but one revolution at a time for several miles, and even then the bergs struck the paddles, splintering them, turning the cakes completely upside down, or grinding them to a thousand pieces. This shook the ship like striking a rock. We passed several as large as our ship. The captain was so kind as to go quite near one iceberg, which was higher than the yard-arms, 80 feet out of water, and stopped the engine long enough for a photographer to snap his camera at the huge object. It is easy for one who is used to these icebergs to tell whether they are dangerous or not; as the water is not as salt here as in the open sea, only one-eighth projects out of water. The solid ice beneath gradually loosens and great cakes will separate and fall out from beneath. This makes the berg top-heavy; they will sometimes turn completely over, making the water splash and tumble around them for some time. They are of exquisite beauty, of every shape and size, sometimes blue as the soft skies, then flashing all the colors of the rainbow in the bright sunshine.

The Muir Glacier.

About 8 o'clock the ship dropped her anchor in 21 fathoms of water within a few hundred yards of one of the most beautiful glaciers in the world. From one side, even with the water, issues a swift, muddy river. Says Mr. Dawson: "Glaciers more immense than those of Switzerland creep from the mountains' summits to the water's edge. Of all these icy rivers the Muir glacier, a frozen wall of ice, 500 feet in thickness, with a breadth of from three to ten miles and a length of 40 miles, rising 300 feet at its mouth above the waters of the sea, is the most wonderful and sublime. Large sections of it are constantly breaking off and falling into the sea, displacing the waters and producing detonations like peals of thunder, causing the ship to plunge and reel at her moorings. Each of these becomes an iceberg, floating off with its imperial colors into the foaming and angry waters. The peaks rise 15,000 to 20,000 feet above the sea, containing within their frozen walls many glaciers, but the Muir is the most striking and extensive. There is nothing grander in all the world. The ice deposited during the glacier age is slowly washing away, exposing giant cedars which have been buried for thousands of years. Here is a spot for the tourist who desires to see the world in the original form of its creation." [See cuts page 249.]

We stepped into the little boats, and in a few minutes were on shore, which seemed like a foreign land. Following a little canyon, we were soon hurrying over the rough and sharp-edged rocks, which was only a thin carpet over a mountain of ice. It seemed more like being on a glacier when we reached the clear, white, honey-combed ice, free of stones and boulders. Keeping on, we soon reached a comparatively high point overlooking a small portion of the icy river; there we stood for some time gazing at the wonders about us. A portion of the crystal river is heaped into rounded hills and knolls; a greater space in the center, which is stated by scientific men to move 60 feet a day, is splintered into thousands and millions of spires and pinnacles from 10 to 30 and even 40 feet in hight, shaded from a deep sea-blue at the base to a silvery white at the summit. Over the whole of the glacier there are thousands of crevices, and rushing water can be heard dashing and gurgling in the depths below. One must be on the lookout where he puts his alpenstock, for often you come suddenly upon holes not more than a foot across the top that extend to the very bottom of the river. While roaming around, we discovered a well about four feet in diameter; one by one we lay flat down and looked into one of God's wonders—a beautiful sight. The hole gradually grew smaller as it descended; looking through a small space, we could see that it again widened and branched off we knew not where. About 20 feet from the surface large drops of water, more beautiful than diamonds or emeralds, trickled out of the blue ice, striking pinnacle after pinnacle, separating, then dropping far out of sight. A large stone was thrown down which bounded from side to side; then hark! it strikes a bench, pieces of ice and stone go rattling down, down, and splash in the running river a hundred feet or more below. After tearing our overshoes to pieces and getting mired down in the light glacier mud, we re traced our steps, walking about on the sandy beach lined with small stranded pieces of ice, watching the front of the glacier, which I have before stated was a precipice 300 feet above the water. Small pieces of ice come tumbling down, and we know that larger ones will soon follow. There! it cracks, totters, weaves forward and backward, slowly at first, then faster, till it plunges down with a terrible crash—a piece of deep blue ice larger than our ship. It sinks out of sight, rises up like a mountain, sinks and rises again, then floats slowly toward our ship, but she is away far enough to be out of danger. The water which was before so calm and still rises like a heavy sea, the waves come faster and faster, followed by others, till we are obliged to run up a rocky canyon to keep from being drawn into the cold, icy waters. This heavy crash loosened many other large pieces, and for a moment it seemed as though the whole front was coming down before us. No sooner do these rise from their watery home than piece after piece come cracking down upon them, sending icy splinters far up in the air. All this, with the Fairweather range in the distance, the highest peak—Mt. Crillon, 15,900 feet—perfectly white with snow, reaching far up into the clouds, makes one feel as though he could not speak, but stand motionless listening to the unaccustomed sounds about him. The half-day at Muir glacier was the grandest of all and makes one feel more than repaid for all the miles he has traveled. We were sorry to leave that spot. As the ship swung round and plodded through the ice-field again, we took a long last look.

About three hours before reaching Sitka we are in narrow passages and among islands more beautiful than any we have yet seen. Mt. Edgecomb, 2900 feet, 12 miles distant, was an active volcano less than 100 years ago. We sighted the smoke from the Corona and in about three-quarters of an hour were side by side. The Ancon had stopped, but the captain of the Corona did not care to talk to us and went sailing by as if no boat was in sight.

Sitka, the Capital of Alaska,

Lies in a secluded bay surrounded by 98 islands, reflecting their tree-covered summits in the mirrored waters. It is the prettiest city in the Territory. The barracks, the custom-house and the governor's castle are grouped together on a high knoll; the castle is a heavy, plain, square structure, built by the Russians in early days, but is fast going to decay. It is 140 feet long by 70 in width, built of heavy cedar logs, and in former years was handsomely furnished, regardless of expense. Since it became Government property of the United States, 17 years ago, all relics were carried away and it is now a rubbish-hole; a fine view can be seen from the roof on a clear day. The object of most interest is

The Greek Church.

The bulging spires, the pale-green roof, the fine clock and chime bells, give it a queer architectural look. It is built of cedar logs, clap-boarded on the outside and canvased inside; the outer paint is light-drab, the interior white. Like all Greek churches, there are no seats, as the congregation always stand or kneel. The main altar is reached through a pair of bronze doors set with silver and gold images of the saints. Only the priests can open these doors and no woman is ever allowed to pass through them on any account. Over these doors is a large picture of the Last Supper; the faces are painted on ivory and the figures draped in robes of silver. On each side of the altar are two very large wax candles, which are kept lighted during every service, but last five years; they cost $40 each. Back of these are other large paintings of the saints covered with robes and draperies of the same chased silver. From the ceiling hang heavy chandeliers and silver lamps. On one of the panels in the side altar is a marvelous painting of the Madonna, which was sent from Russia 80 years ago. One who is fond of such art could stand hours looking at the beautiful, soft features of each, which look as though they could speak. The faces and hands are painted on canvas, but not a stroke of the brush is visible. A drapery is wrapped about the head and shoulders of hammered silver and gold of the finest work imaginable; $20,000 has been offered for this painting, but refused.

Other very old but much less valuable paintings were scattered over the walls. We were shown several very costly robes worn by the priest; some were damask of heavy velvet embroidered with bullion; those worn on Easter Sundays were cloth of gold and silver, most dazzling to the eye. The crown worn by the bishop is quite tall, with genuine diamonds, amethysts, pearls and rubies thickly set in a filigree of gold. During every marriage service crowns, much smaller, are placed over the head of the bride and groom. The choicest treasures of the church were sent to San Francisco about three years ago for safe-keeping, but not long after the church and contents were destroyed by fire.

Along the edge of the sidewalk on the main street sat 30 or 40 Indian women in their bright-colored dresses and handkerchiefs holding out their baskets and curios for our inspection. Back of the city a short distance is a beautiful hard pebbled walk, made by the Russians, which winds through the shady forest, among the most delicate ferns and wild flowers; old stumps of trees are covered with bright-green mosses of many varieties. Across the clear, crystal waters of the Indian river is a small suspension bridge; around there persons can ramble for hours gathering blueberries, salmonberries, blackberries, strawberries and other kinds in their season, or sit on the rustic seats and say, Oh, what a restful place, compared with the rustle and bustle a city life. Cedar trees six feet in diameter can be seen, with ferns and mosses growing far out on the limbs. As we returned, we stepped into the Jackson Institute, a Presbyterian mission-school and home, and were kindly taken through the building by Mr. Jackson himself. There are 150 girls and boys in the school, the majority taken from their dirty homes or picked up in the street; they are clothed, educated, taught a trade, sent out in the world where positions are found for them, being much wiser than their parents. An entertainment was given by the children in the evening, which was excellent.

After giving this city an adieu, we retraced our course

Through Sounds and Channels,

Stopping for a few hours at the highly perfumed herring-oil town of Killisnov, then passing the entrance to Glacier bay. Around the upper point of Admiralty island we touched Juneau and Douglas Island. The clouds were separating and the sun trying hard to give us a welcome, but we soon ran into the dense fog, that settled down over the islands and main land and shut out our entire view. We were guided by the echo from the ship's whistle which blew every few moments. A second of silence after the screech of the whistle, then a long, clear echo, gradually growing fainter, till it was nearly lost in the cold, damp fog, then from the opposite side it came louder than the first, lasting from 15 to 25 seconds.

Coming to the entrance of Wrangel Narrows, the fog was so dense the engine was stopped and we drifted around the bay for some time; floating ice came out from its long hiding-place from some glacier not far off. At last it became lighter, the high-topped islands showed themselves, and soon the shores on either side were plainly visible. The bell rang, the engine started and the Ancon was plodding along through the narrow channel. Pursuing our way south, for we were now homeward bound, turning an angle between two islands, we again came in sight of the prettily situated town of Fort Wrangel. Snowy mountain-peaks that were before hidden in the dark, heavy clouds now loomed up in God's glorious sunlight in the shapes of castles, lions, bears, etc. As this is the only place where the totem poles exist, the tourists were all eager to take one last look at the queer, roughly carved structures.

At Dixon entrance and Milbank sound the strong wind from the ocean gave us an idea of what an outside passage would be; the boat rolled and pitched until it was impossible to

promenade the deck longer. The captain intended to pass Queen Charlotte sound that evening, which is 40 miles of open sea, but for the sake of those who were troubled with seasickness, he ran the boat into a picturesque little inlet called Safety Cove. The water there was as calm and still as a small lake; the wind ceaseless. Before time for the people to rise—I cannot say daylight, for we were then so far north that there was only about two hours of darkness—we had passed the dreaded sound into still water again. As we were nearing the end of our journey the nights became longer and the people knew better when it was time to retire.

Nothing more of consequence happened; we were landed safe and sound at the Tacoma wharf on the evening of July 2, 1889, having traveled 2700 miles since departing from that place. Before leaving the ship a set of resolutions were passed and signed by all the tourists expressing their thanks and gratitude to the captain and officers for their kindness to the passengers.

As we were again in the noisy, rattling cars, in dust and heat, we almost wished we were in the cool, bracing atmosphere of Alaska.

Tuolumne County Mines.

The Chaparral.

EDITORS PRESS:—This mine is owned by Mr. Fred Wedzell, a carriage-builder of Sonora, and is located on the Tuolumne river southeast of the Buchanan mine, and adjoining that property on the south. In area it is 1500x600 feet, and covered by a mineral patent. Its extensions run to the river below, at which point there was a ten-stamp mill, but it was burned down. The turbine wheel still marks the site where the battery stood. This mine can be opened from the mill-site, giving backs of not less than 2000 feet to the apex of the mountain. There has been considerable work done on the property, but a large amount of it is almost useless, owing to the gross ignorance and carelessness of the men employed by the then owners. They were all business men, knowing nothing of mining, and trusted implicitly to their hired miners, leaving it to them to run the business as they saw fit. Instead of running on the veins and prospecting their value, they ran hap-hazard in country rock, sometimes in the footwall, then cutting through the veins, filling up drifts and doing the work in the most reckless manner. This seemed to me a systematic design on their part rather than an actual want of mining knowledge—perhaps to get possession of the property themselves—for after work was suspended and the men paid off, rich rock was discovered which had been covered up and not reported to the owners at the time it was found. The mine naturally received a "black eye" from the length of time and amount of money spent—over $20,000—with nothing found. Yet when the mine was first opened by a shaft from the surface in a five to seven-foot vein, exceedingly rich quartz was taken out and worked in an arastra. The chute was cut through, perhaps by mistake, and the shaft allowed to cave in. Subsequently three tunnels were entered, the lowest level being 600 feet in length, or rather distance; for if it had been continued 60 feet farther it would have come out not far from where the tunnel was started—almost running in a circle. Rich ore has been found, nevertheless, in this level, and continues downward below water-line, which I have examined. The middle tunnel—300 feet—shows two large-sized veins. At the junction, or point of contact, here I have seen rich quartz of high grade, being a continuance of the chute that was found in the shaft first mentioned. The formation is slate of a black, metalliferous character, containing considerable manganese, which permeates the quartz.

There is scope for works of great magnitude on this property, for a low level tunnel can be entered at or near the river, giving backs of over 2000 feet. The power for air compressors or electricity can be cheaply and easily obtained by water from the turbine wheel now in place. This tunnel would develop all the veins and spurs known to exist in this mountain-side. A mill of any size, with free water, can be built on the mill-site belonging to this group of mines. Further, the tunnel can be opened and driven on the main vein the whole distance. Why do capitalists seek mining ventures in Mexico, South America, Africa, Alaska and numberless outlandish places, while at home in our splendid climate and easily-accessible districts our mines are left forsaken and uncared for? It was only a few days ago a mining gentleman from New York visiting our county was astonished at our mineral resources, and confessed he was ignorant of the fact that we possessed such rich mineral wealth. His time was too limited to stay sufficiently long to acquire more knowledge, but he became interested in several claims during his short visit that will cause him to return later on. Thanks to the MINING AND SCIENTIFIC PRESS, which is read largely in the East and becoming daily more sought after, read and relied on for its careful and truthful statements and reports of the mines of California, in a short time capital seeking investment from the East and Europe will see plainly it is to their greatest advantage to visit California before risking their cash in doubtful places and in wildcat schemes, where distance only lends enchantment to the view.

Sonora. ARGUS.

NEW GAME BIRDS.—The State Fish Commissioners are importing some new species of game birds for propagation, among which are Australian quail and Japanese pheasants. They are doing this under authorization of an Act of the Legislature, approved on the 16th of last March, by which they are instructed to import improved varieties of game bird.

MONO.—At the annual meeting of the Mono G. M. Co., the following officers, being re-elected, will serve during the ensuing 12 months: George I. Ives, president; L. Osborn, vice-president; B. L. Burling, secretary; David Woods, assistant secretary; John Kelly, superintendent; Bank of California, treasurer.

Marshall's Monument.

EDITORS PRESS:—Standing on a rounded knoll overlooking Coloma, the Marshall monument presents a fine appearance in the distance. The site, which was presented by Placerville Parlor of the Native Sons of the Golden West, is excellent. A fine roadway has been graded to the summit, but still lacks a few hundred feet at the base of being complete.

Marshall's figure represents him standing with a nugget in his right hand, while the left points to the site of Sutter's mill, where Marshall first found gold. Marshall is represented as dressed in a slouch hat, shirt with sleeves rolled up to the elbows, and pants with legs inside of rubber boots. A knife in its sheath is attached to his belt on one hip, while a holstered pistol adorns the other. The figure is large and life-like; not so the color. Standing near the monument gives one the impression that the figure had been executed in oil—that is, lamp-black and oil—and in consequence Marshall looks like a grimy coal miner just up from the shaft. The monument is of granite and some soft rock that looks like lava ash or terra-cotta. The granite is all right, and the monument would have been a success had it been made entirely of this rock.

On one side is the inscription giving the dates of the birth and death of Marshall and the statement that he first found gold in Sutter's mill-race on the 19th day of January, '48. On the opposite side are the names of the commissioners in bold relief, so bold that it would indicate that the monument was erected rather to their memory than that of Marshall.

On the front is an attempt to bring out in relief the seal of the State, while on the back is a supposed representation of Sutter's mill, the race, and a miner, taller than the pine trees surrounding him, trying to hold fast to a perpendicular bank and dig at the same time. Nature will soon kindly obliterate all this, as the material in which it is gouged out will soon crumble away. It is already cracked, and here and there a piece has chipped out.

The derrick used in the erection of the monument still stands over it as though waiting to take Marshall down whenever he shall feel like freeing himself from his coat of soot. If there was ever a case where "distance lends enchantment," Marshall's monument is one of them. The site is grand, and, in the distance, the monument and figure of Marshall look well, but on close examination the whole thing looks cheap. The State should either have put in a plain granite slab where the present relief burlesques are, or close the road leading up to the monument and thus prevent a too close inspection.

E. H. SCHAEFFLE.

Coloma, Cal, Sept. 8, '89.

THE Paradise mines, Nevada, are said to be looking better than for many months past. The Wild Goose is producing very good ore, of which there is considerable in sight. Supt. McCurdy is making arrangements to run the mill night and day.

The Folly of Abandoning Mines.

From Grass Valley to Forest Springs, a distance of four miles, there were in 1866 no less than seven mines running. In a few years after that there was scarcely a stamp dropping on any of them. They were worked out and abandoned in all, except holding the title. A year or two ago work was begun on several, and now the sound of the pick and shovel, the drill and the stamp-mill is heard all along the line. The Omaha employs a hundred men and keeps 18 stamps running night and day. The Hartery is being systematically reopened, and will soon be fully equipped for work. The Norambagna has changed hands, and will be in full blast after awhile. Success is attending the operators, and it is reasonable to expect that the district will be a very lively one before another year. The experience there proves that the shutting down of a mine is not evidence of its being worked out. The North Star and Empire mines at Grass Valley are other instances showing that those who were regarded as wise miners years ago could not see into the ground, and when they shut down did not know what they were doing. In Nevada district there has been the same kind of work done. Some men show their wisdom in shutting down a mine as soon as they encounter a bad break of ore. But when a successor comes along, who has nerve enough to explore further, a good paying mine is made out of the one abandoned. There are a half-dozen mines lying idle within sight of this town, which were once rich bullion-producers, that if reopened and sunk upon, would, without doubt, develop into dividend-payers again. The company that has determination enough to try the experiment will make a good thing.—*Grass Valley Union.*



VIEW OF UNION SQUARE, SAN FRANCISCO.

Union Square, San Francisco.

On this page we present a fine view of Union Square, San Francisco, one of the few breathing-spots within the city limits. The view in our engraving is taken from Geary street, and presents, besides the elegant walks and shrubbery of the park, several fine buildings on the opposite side on Post street. These "lungs" of the city, as they have been not inaptly called, are not too numerous where they can be conveniently availed of by those who are in most need of them, and any fine day will find the seats located here and there in Union Square fully occupied by those who want to enjoy the sunshine and a breath of fresh air in the heart of the city. Being photographically correct, adds value to our picture to readers abroad as well as in the city.

THERE will be 12 bullion-producing mines on the Comstock lode when the flow of water in the Carson river will admit of operating the mills along its course.

TWENTY SIX brick buildings have been put up in Bakersfield since the great fire.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

CLOSED.—*Ledger*, Sept. 21: The Morley Co. suspended operations upon their property, the old Wetzler mine, Hunt's gulch, on Thursday of last week. This step was taken in obedience to a telegram from headquarters in London, stating that full instructions as to its future course would be sent by mail. It is generally believed that the company intend to abandon mining in this county. The Morley venture was regarded by mining experts as an unwise one. There was little in the past history of the claim to justify any expectations of meeting with a pay chute.

NORTH STAR.—The east drift at North Star has encountered the footwall and gouge matter at a distance of about 70 feet from the shaft. This is regarded as the most important development yet made. No quartz has been met with worth speaking of, but by running along the wall north and south it is confidently expected to find a well-defined quartz ledge. The rich ore met with a year ago was frozen to the granite; there were no traces of gouge or walls, and the ore seam could hardly be expected to widen out into the dimensions of a ledge under such conditions. It showed that rich quartz existed within the claim, and now the discovery of gouge and footwall gives birth to a reasonable hope that the parent ledge will ere long be discovered.

THE THIRTY-STAMP MILL of the Cosmopolitan mine is expected to start up early in November. There is every reason to believe that this property will at once take its place among the list of dividend-paying mines. The company have from the start conducted their operations in a business-like way. After a thorough exploration of their ground, reaching to a depth of over 500 feet, revealing extensive bodies of gold-bearing quartz, the erection of a mill was decided upon. The owners were willing to expend their means liberally in first proving whether or not a mine existed within the limits of their claim, and not until this point was affirmatively settled as far as anything short of the actual milling of the rock can settle it, were preparations made to put up a mill. The owners of the North Gover are determined to set to work and immediately develop their claim. From its present promising appearance the company expects, by the judicious expenditure of a little money, to lay bare a ledge whose gold-bearing qualities must be equal to that of the Gover, as it is undoubtedly a continuation of the same ledge. In the tunnel which is being run on the Paugh mine, near Clinton, they have struck a large body of water flowing a steady stream of about five inches. The tunnel is not much over a quarter of a mile from the McKenzie mill, and the McKenzie Bros. are contemplating putting in boxes to run it to their roller-quartz mill for battery purposes, and start up by steam.

Calaveras.

A LARGE LEDGE.—Calaveras *Prospect*, Sept. 21: We were surprised to find a quartz lead within rifle-shot distance of the county seat, at this late day undeveloped, yet for years known to be rich. At different times within the last 25 or 30 years rich deposits of quartz gold have been taken out by different parties, but at no place on the lead has any one gone down on the vein to a depth of over 35 or 40 feet. About a month ago Mr. Morehouse bonded 1500 feet of this lead from Mr. McFall, with the privilege of prospecting the vein for one year. In the last two weeks a perpendicular shaft has been sunk to a depth of 35 feet in the foot-wall of the lead. At 12 feet from the surface, quartz appeared in the shaft, and at 35 feet a four-foot vein had been crossed. Saturday evening a large piece of rock was brought to town and mining men here pronounce it to be as fine a piece of rock as ever was brought to town. As there is more water than can be handled conveniently with a windlass, Mr. Morehouse will sink for a sump and then drift across the lead. At this point the vein is about 30 feet wide on the surface; 100 feet south the vein shows a body of ore 60 feet in width; and north for at least 400 feet the croppings on the surface show a ledge from 40 to 75 and 100 feet in width. In crossing a gulch 100 feet from the shaft the croppings carry free gold. In a reef of solid quartz, about midway of the ledge, where the vein is from 60 to 80 feet wide, we saw gold with the aid of the glass, and also with the naked eye. A small prospect can be had from almost every piece of rock you pick up on the surface. Mr. Morehouse told us that this was the finest prospect he had seen in a great many years in quartz.

THE ARIEL MINE.—*Mountain Echo*, Sept. 19: We visited the Ariel mine, owned by Hutchinson & Brackett, and situated at Spanish Bar on the Mokelumne river, and were shown through the tunnel recently run on the property. The vein, which makes its appearance at the mouth of the tunnel about an inch in width, courses along the tunnel line and widens as it is developed. The tunnel is in over 40 feet, and in the face the ledge is about four inches in width, giving evidence that as it is followed into the hill it widens. It has been traced on the surface for half a mile or more, the croppings being quite prominent in many places. As fine a lot of specimens as we have ever seen have been taken from the vein in the tunnel. The ledge is a pocket vein. Quite a handsome little sum has been realized by crushing assorted ore in a hand mortar. Several hundred dollars worth of specimens have been shipped to the East to be placed on exhibition. Some of the ore we have seen will yield at least $5000 a ton. The tunnel is being pushed ahead as rapidly as possible.

Fresno.

NORTH FORK DISTRICT.—Cor. Fresno *Republican*, Sept. 20: Northeasterly and distant from Fresno about 100 miles is situated what is known as the North Fork mining district. The veins will average from 3½ to 9 feet in width, showing a high-grade milling ore, namely, black sulphurets of silver in combination with arsenical sulphurets carrying heavily in gold. The most promising locations are the Desota, Eureka, Fresno, Advance, Mountain Meadow, Bright Metal, Pierce and Dodge mining claims, lying in syenite and black slate formation, with an abundance of excellent timber, water-power, etc., in fact fully possessed of every facility necessary for successful mining operations. Farther southeasterly are the Fish Creek mines discovered by Edwin Fore & Co.

Inyo.

A PLACER PROSPECT.—*Index*, Sept. 18: We learn that Crit Hampton has struck placer diggings in the vicinity of Big Pine which prospect as high as 15 cents to the pan, and that he is now arranging to work them.

Lassen.

HAYDEN HILL.—Lassen *Advocate*, Sept. 21: Mr. L. H. Hopkins came in on Sunday and reports times as being very dull in that once lively and flourishing burg. Like all other mining camps it has its ups and downs, and from what Mr. Hopkins tells us of the prospects there, we would not be surprised to hear at any time in the near future of another boom striking the town, surpassing anything of former years. There are only four claims now working on the hill, and these employ but few men, most of the prospectors having gone toward the valley for winter quarters. A few men are still "Bug Dusting" on the dump of the old Juniper. The Golden Eagle, now owned by Mr. Hopkins, has paid for years and work is still in progress. The main shaft is down 290 feet, with a fine foot-wall all the way, and good prospects in the bottom. The Evening Star, formerly owned by the Hoes Bros., and out of which they made a fortune, now owned by Preston & Howard, is being worked by the latter gentlemen and is looking well. The Brush Hill mines are also being developed by a company of Belgians, who bought the property from the Hoes & Harbert Bros. Mr. Hopkins thinks that if Hayden Hill had one good company to take hold of its mines it would prove one of the best producing camps in Northern California.

Mono.

GREEN CREEK MINES.—Bridgeport *Union*, Sept. 15: The Green creek mines are attracting much attention and the locators of mining claims in that section are to hold a meeting for the purpose of organizing a mining district. Good rock is almost daily brought in from the creek, and the prospects are seemingly good for it to become a lively mining camp in the near future. The ledges are large and the ore assays away up.

Monterey.

COAL-OIL FIELDS.—Salinas *Democrat*, Sept. 21: There was filed for record this week a location notice of a placer-mining claim of 320 acres signed by 16 locators, each claiming 20 acres. The purpose of the location is to mine for petroleum, asphaltum, gas and other mineral. The claim is known as the Alsop claim, and was discovered by Alsop and sons a short time since while boring an artesian well. The oil pumped from the well is said to be the finest quality of lubricating oil, and the formation in which it has been struck is the one in which oil abounds wherever discovered in great quantities in the Eastern oil regions. It is situated about six miles from Salinas and between the Toro and Buena Vista ranchos.

Nevada.

MINING CLAIM BONDED.—Grass Valley *Union*, Sept. 22: The Good Hope quartz claim, in the Cabbage Patch district, west of Spenceville, was yesterday bonded to Messrs. George Gurne and George Gamble of Santa Rosa, Sonoma county. The ground was located some time ago by Wm. Eddy and Alf Gale of this place, who had sunk a shaft on the vein to the depth of 45 feet. By the terms of the bond Messrs. Gurne and Gamble are to sink the shaft to the depth of 100 feet and drift on the vein the same distance. The other conditions of the bond are private. The claim is said to prospect encouragingly in free gold. The work of sinking the shaft will be commenced to-morrow by six practical miners.

Placer.

HATHAWAY.—Placer *Argus*, Sept. 21: We visited the Hathaway mine, at Ophir, Tuesday. Ten stamps are kept running on good ore, and as soon as there is sufficient water, the other ten will be put in motion. They are now working on the 200-foot level, and taking out fine ore, which carries quite a large percentage of silver. The ore is run from the mine in cars, a distance of about 150 feet to the ore-bin; from there it passes through the rock-breakers to the self-feeders. The pulp after passing over a large surface of copper plates is received by four Garnier concentrators, which separate the sulphurets and any fine gold that may pass the plates from the lighter material. Two carloads of the concentrations have been shipped to Denver, Colorado, to be worked. Working for silver in this section is something new, but the company have found that there is sufficient silver to add considerably to the value of the ore if it is saved, and they propose to work it for all there is in it. The construction of the concentrators in use at the mine is very simple, and besides doing good work they are a cheaper machine than most of the concentrators now on the market. There is also a Woodbury concentrator at the mill which will be given a trial soon. The machinery is all run by water-power, which is quite a saving compared with steam-power. The Hathaway is without doubt a valuable property, and is evidently under good management. Several other mines are being developed in the district, and the indications now are that Ophir will again become a lively mining camp. The Hidden Treasure Co. has passed through the cross channel encountered some time since, and is getting the old-time yield of bullion. A drift of some 300 feet in length has been run in the north gangway of the Mayflower mine, through a deposit of yellow quartz, gravel and sand. This crosses the regular channel at right angles, and sinks about 12 feet lower. Good prospects are being taken from it. It is thought to be the Orono channel. C. W. Reed from the Drummond mine, near Iowa Hill, says the mine is looking well and they are milling about 20 tons per day with their new Huntington roller, which is equal to a ten-stamp mill. John B. Hobson of Iowa Hill was in town the early part of the week. Mr. Purdy speaks very favorably of the Whisky Diggings copper mine.

BRYAN MILL.—Placerville *Observer*, Sept. 21: John M. Bryan came over last week from the Harmon mine at Iowa hill, where he has started one of the Bryan roller-mills. The mill is doing its work so well that the owner of the mine, Gov. Waterhouse, has ordered another of the same pattern to be placed on the same mine as soon as possible. Gov. Waterhouse has now several of these mills running to his entire satisfaction.

San Luis Obispo.

COAL AND SILVER. — Santa Margarita *Times*, Sept. 20: Uncle Sam Epperly came in from the Avenales this week and reports the prospects brighter than ever for that locality. Mr. Epperly has great faith in the coal deposits of the Avenales, and it is their remoteness from the railroad that prevents the deposits from creating a general coal boom. On his mine up in Biddlecomb canyon he has sunk down on the coal ledge to the depth of 14 feet, and has come in contact with two more veins; the three veins are two inches wide each and are blending together in one or two places. The silver quartz ledge is more of a float than a ledge, but the ledge is there if float is any indication. The float quartz is pretty rich, and assays $3.72½ to the ton. Three blasts have been made in the crest of the ledge. The mine is about 100 feet off the Garcia trail.

Shasta.

TELLURIUM.—Shasta *Democrat*, Sept. 20: Peter Scherer has resumed work on the Tellurium mine. Last week he pumped the main shaft dry and started to sink. The shaft is down 125 feet, and at that depth the ledge is 2½ feet wide, with about five feet of ledge matter between walls. The ore extracted carries considerable free gold, also rich tellurium sulphurets.

MAMMOTH.—Edward Lisle and a gentleman by the name of Wells, both representatives, and the latter private secretary of John W. Mackay, made a hurried visit to the old Mammoth mine, in Old Diggins district, last Sunday, and that evening boarded the overland train, homeward bound, with a large number of samples from the mine. They were very seclusive and uncommunicative while here, but their visit to the Mammoth has caused much gossip among the mining fraternity. It would be a streak of good luck for the mining interests of this county to have the king of the bonanza mining firm invest in some of our mining property.

Sierra.

LOGANVILLE.—*Mountain Messenger*, Sept. 21: The pump at the Marguerite mine was started yesterday and works to the entire satisfaction of all. At a stroke of six to the minute it lowers the water a foot an hour. The pump is one built and put up by Mr. Knight of Sutter creek. It is a 17-inch pump with a 7-foot 9-inch stroke. It is at present throwing near 300 feet and can be run at the rate of 15 strokes a minute.

Siskiyou.

MEDICINE LAKE COUNTRY.—McCloud *Pioneer*, Sept. 21: It is reported that one of a party from Bartle and Fall River struck a rich gold mine up in the Medicine lake country, but as the scene of the discovery is about 40 miles from water, and the climate very cold, there is little probability of the find ever amounting to anything. However, it is said that a couple of capitalists of a banking and real estate firm at the city, who were stopping here looking for timberland investments, talk of organizing a stock company to purchase, and if practicable, to work the mine. Samples of the rock were sent to a prominent assayer below who pronounced it a conglomeration of stuff common to the Medicine lake country, the gold showing up in chunks and patches over the white quartz. The other members of the party generously renounced all claim to the find, leaving the Fall River discoverer in full possession of the mine.

QUARTZ AND RIVER MINES.—Yreka *Journal*, Sept. 25: The richest crushing of quartz yet realized on Humbug is now being made from the Spencer ledge, consisting of 50 tons, believed to be $100 ore, on an average, judging from prospects made. Boyle & Co. are laying about 1000 feet of iron pipe from a spring on top of the mountain to their quartz ledge at north fork, so as to have water for drinking purposes and general use at the mine. This company has already expended a large amount of money in making improvements at both mine and mill. The cool weather of past few days with the cool evenings, has caused the water to come up in the ground from the bedrock and springs, and with a little rain, some of the dried-up creeks will afford running water again to prove highly beneficial to the miners. The river miners at the Klamath are now crowding their work with energy and good success, and will take out great quantities of the glittering dust until the winter freshets of December oblige them to suspend operations.

Solano.

THE ST. JOHN MINE.—Benicia *Era*, Sept. 21: Owing to a recent rise in the price of quicksilver, D. W. Harrier, owner of the St. John mine, has decided to crush the ore easily reached, and for this purpose has put a force of men at work clearing out the main tunnel, under charge of Mr. Wills, a former superintendent of the mine. The whole county about is so rich with quicksilver that at any time there is profit in working the loose material without even entering upon the principal lode. The mine has been idle for some time, but the clearing out of the tunnel is not so difficult a job as it was at first expected to be.

Trinity.

BIG MINING SCHEME.—Redding *Free Press*, Sept. 21: We are informed by reliable parties that there is a big gravel-mining scheme on foot, and if put into execution will do much for Trinity county and Redding. An English company has succeeded in bonding the gravel mines of Trinity Center and all the gold-bearing lands including the town-site. The mines included are the Sikes, Center, Zarli, Brush Creek, Coyle, Elevator and Rumfelt. The ditches taking water out of Swift, Brush and Buckeye creeks will be enlarged and the latest improved machinery used. Trinity Center is one of the richest gravel deposits in the State, and the capital that will be forthcoming will open it up and make things decidedly lively. This district does not come under the ban of hydraulic mining, as the slickens do not interfere with any one.

NEVADA.

Washoe District.

UTAH.—Virginia *Chronicle*, Sept. 21: On the 600 level the north lateral drift from the main west drift is advanced 633 feet; formation vein porphyry and quartz, showing value.

OCCIDENTAL CON.—During the week extracted and milled 328 tons of ore showing an average assay value of $17.45 per ton.

BEST & BELCHER.—On the 550 level, the northwest drift is extended 147 feet. Formation porphyry and clay with streaks of quartz. On the 1000 level the northwest drift is extended 260 feet. Formation porphyry with streaks of quartz.

NORTH OCCIDENTAL.—Continue stoping ore from the 450 level.

SIERRA NEVADA.—On the 520 level from the main east drift, 1185 feet from the shaft station, a south drift is advanced 135 feet. Formation porphyry with some water.

UNION CON.—On the 1465 level, the north lateral drift is advanced 417 feet from the south line, continuing in porphyry and clay.

MEXICAN.—On the 1465 level the north drift from the west crosscut No. 1, 200 feet in from the lateral drift, is advanced 384 feet, continuing in porphyry and lines of quartz.

OPHIR.—On the 1300 level the east crosscut from the shaft station, to connect with the top of the raise above the 1465 level east drift, is extended 118 feet, face continuing in porphyry.

CON. CAL. & VIRGINIA.—The usual quantity and grade of ore is being extracted from the various openings on the 1400, 1435, 1500, 1600, 1650 and 1950 levels. On the 1435 level from the bottom of the winze sunk below the south drift from the Ophir line, an east drift is advanced 72 feet. The face is in quartz of low value. Continue to stope ore of good quality from the point of connection between the northeast drift from the top of upraise No. 2 above the 1600 level. During the week 1072 tons and 970 pounds of ore were shipped to the Morgan mill, 1052 tons to the California. The average assay value of all the ore worked at these mills during the week, according to battery samples, was $27.95. Shipped during the week bullion valued at $45,238.72 to the Carson mint. Bullion valued at about $12,000 on hand.

GOULD & CURRY.—On the 400 level west crosscut No. 1 is extended 322 feet. Formation porphyry.

EAST SIERRA NEVADA.—The 520 level south drift is out 88 feet and continues in porphyry.

ANDES.—The 350 level west drift is showing quartz.

SCORPION.—The 520 level south drift continues.

SAVAGE. — The upraise above the 500 level west drift continues in ore.

HALE & NORCROSS.—West crosscuts Nos. 1 and 2 on the 300 level continue in low-grade quartz. Preparing to resume operations on the 1200 level.

CHOLLAR.—Usual progress is made in advancing 650, 750 and 850 level explorations, without any change in formation from last report. The winze below the 200 level continues in low-grade quartz.

POTOSI.—The 850 level south drift is penetrating vein porphyry.

IMPERIAL.—A winze is being sunk below the 300 level from which a drift will be run to connect with the shaft for an airway.

WARD COMBINATION SHAFT. — The work of excavating a station on the 1050 level is being pushed to completion and a west drift will be started next week.

ALPHA.—The 382 level east crosscut continues in low-grade quartz. The shaft is down 45 feet below the 500 level.

EXCHEQUER.—Usual progress made in advancing 382 level explorations without change in formation.

YELLOW JACKET.—The 500 level west drift is out 670 feet. The daily ore shipments average 50 tons, and will be increased to 100 tons next month.

CONFIDENCE & CHALLENGE.—The 500 level joint Imperial north drift is out 950 feet from the Yellow Jacket shaft and continues in quartz and porphyry. The east crosscut from this drift is in clay and porphyry.

OVERMAN.—The north drift from the winze bottom is out 85 feet.

CROWN POINT. — The 700 level south drift is out 240 feet and has entered quartz assaying from $8 to $15 per ton. The 600 level east drift cut through an old lateral drift where it entered quartz giving low assays in gold.

BELCHER.—Have started an east crosscut from the winze bottom on the 1200 level, The 200 level west crosscut is in porphyry and clay.

SEG. BELCHER.—The 1100 level east crosscut is showing seams of quartz.

CALEDONIA.—Laying car tracks and advancing explorations on the upper levels.

JUSTICE.—The usual grade and quantity of ore crushed at the mill.

ALTA.—The ore now extracted from the 925 level stopes is showing improvement. The mill is running as usual.

NEW YORK CON. — A large amount of ore is stripped between the 600 and 800 levels, and preparations for crushing it at the Douglass mill are in progress.

NORTH GOULD & CURRY AND EAST BEST & BELCHER.—Advancing a northwest drift to connect the workings. Repairs in progress at various points.

Cherry Creek District.

ORE STRINGER.—White Pine *News*, Sept. 21: A stringer of ore has been struck in the old Star mine at Cherry Creek that goes $1200 to the ton. It is being followed and may develop into a large ore body.

Kirman District

GRAVEL.—Virginia *Chronicle*, Sept. 18: A gravel bed has recently been discovered near the Norrie mine which the locators say carries enough coarse gold to pay handsomely if free water was available to wash it by the sluicing process. Several grains the size of small bird shot were obtained by the panning process. The locators will work the gravel by the rocker process next spring when a sufficient flow of water from melting snow is obtainable. The gravel bed is located on the plateau east of the head of Crown Point ravine and is several hundred feet higher than C street.

Pioche District.

RAYMOND SHAFT. — Pioche *Record*, Sept. 18: Since our last mention of work at the Raymond shaft the 12th level has been cleared and timbered to the Black winze station, which is about 1500 feet from the shaft. The whole station is caved down and the work of getting through it is laborious and necessarily slow. The winze itself is not yet reached. It was expected that the upper workings of the Black Ledge could be entered from the winze station after a few days work in removing debris, but this was found impossible, and last Tuesday an ascent was made through an old winze which is 100 feet from the Black winze crosscut and nearer the shaft. A 60-foot stope was found with an abundance of ore in place from which samples were taken. The stope was caved and on this account explorations were

somewhat limited. The assay from the samples taken was highly satisfactory to the parties interested. The winze station will probably be cleared in a week or two, when other portions of the Black Ledge can be examined.

THE PIOCHE CON. has for some time been running a prospect tunnel into the mountain from a point about 100 feet east of the Raymond works. The object was to strike the manganese vein which crops out on the surface on the divide above. Last Tuesday the ledge was entered and a fine showing made. The ledge where struck is several feet in width, and is interspersed with large chunks of galena. The walls are well defined and everything indicates the presence of ore.

Red Canyon District.

RED CLOUD.—Virginia *Chronicle*, Sept. 18: Ore is being extracted from the Red Cloud mine in Red Canyon district, Douglas county, which it is expected will produce $100 per ton in gold. The district is noted for pockets of gold-bearing quartz, and a divining-rod disciple is now there who claims he can locate hidden pockets of the yellow metal with unerring certainty with his magic willow wand.

Robinson District.

MILL RUN.—White Pine *News*, Sept. 22: A. R. Watson has leased the Ely mill and will make a run on ore from his mine in Robinson. From samples of gold pounded out of a few pounds of the rock, which we have seen, the ore must be very rich, and Mr. Watson can hardly fail to make a success of the run. Such splendid showing of gold ore in a mine anywhere else than in White Pine would cause no little excitement.

Tuscarora District.

BELLE ISLE.—*Times-Review*, Sept. 20: North drift, 250-foot level, extended 15 feet.

NORTH BELLE ISLE.—The shaft has been sunk and timbered 15 feet, and a station set of timbers has been put in at the 500-foot level.

GRAND PRIZE.—Water is now down within 8 feet of the 500-foot level station floor. Concentrator running steadily and doing good work.

NAVAJO.—The crosscut from the end of the south drift, 350-foot level, extended 16 feet. Upraise south end, same level, extended 7 feet. Vein is considerably wider with streaks of rich ore through it.

NORTH COMMONWEALTH.—Joint crosscut, 225-foot level, extended 13 feet. There is a slight increase in the flow of water. Main south drift, 100-foot level, extended 16 feet. Face looks about the same as at last report.

DEL MONTE.—Joint crosscut, 225 level, extended 13 feet, showing some more water. Main north drift, 100-foot level, extended 14 feet. The face continues in ore.

COMMONWEALTH.—100-foot level; No. 14 north drift, from No. 13 west crosscut, has been extended 19 feet; drift all in the vein; face showing some good ore. No. 5 east crosscut, from No. 7 south drift, extended 17 feet, passing through some stringers of ore. 150-foot level: South intermediate drift, from top of No. 15 chute, extended four feet; face showing high-grade ore.

ARIZONA.

MOHAVE NOTES.—*Miner* Sept. 21: A new shaft will be sunk on the Gold Back mine, Chloride, about 150 feet from the old one. The Keystone mill has "hung up," they having run through all their tailings that would pay. The Tintic mine, Chloride, is still producing a good grade of gold ore and will make a 15-ton shipment in a few days. Marshall & Jamison are taking out some fine gold ore from the Jamison mine, Layne Springs. Crosscutting has been commenced by the Keystone Co., Mineral Park, from the 50-foot level of the Congress shaft. The lessees of the Crescent mine, Messrs. Miller, Hitchcock and Grant, in the Peacock mountains, are doing exceedingly well, having a fine body of high-grade ore opened up. The Monarch M. & M. Co. have sold their mill at Lost Basin to the Rattan Co., who will immediately proceed to erect the same on the river near the Rattan mine. The A. & P. railroad have issued a new freight tariff on ore in lots of not less than 10 tons from Daggett to Kingman. The rate is $2.50 per ton from Daggett; Fenner, $1.50; Needles, $1.25; Powell and Yucca, $1.20; Drake, 80 cents. This is a much lower rate than formerly, and is an inducement for miners to ship ore to this place. At the sampling works during the past week the following lots have been run: Six carloads of the C. O. D. have been shipped and four more await working, nearly all the output of that mine last month; American Flag, small lot; Harris & Robinson, lessees C. O. D., a small lot of high-grade ore. The strike stopped the shipments of ore, but the ores accumulated are being loaded as fast as cars can be procured.

NIGHTHAWK.—Supt. Bowers of the Nighthawk mine will soon leave for California to confer with his co-owners in regard to erecting machinery on this mine. The water has not increased with the depth of the mine, but the distance it has to be raised makes it impossible to sink deeper without steam. The north and south drifts from the bottom of the north winze have been driven 30 feet each and both are and have been in fine ore, and the amount of high-grade ore at present in sight will require about two months to stope out. All indications point that these drifts have tapped the apex of the largest and richest body of ore yet encountered in this phenomenally rich mine.

CASTLE CREEK.—Arizona *Journal-Miner*, Sept. 20: Castle Creek mining district, located about 54 miles south of Prescott, so far as the general formation is concerned, as well as the showing made from development of properties, gives promise of becoming one of the bullion-producers of the Territory. A smelter, brought in at heavy expense and constructed on the banks of Castle creek, has lain idle for several years, through lack of ores to smelt. It was originally intended to smelt ores of the district which showed up a good percentage of copper, but from some cause or other a failure was scored. The failure of this smelting proposition, like any failure of a mining enterprise, gave the district a backset for some time, but it is now coming into prominence again through new blood and new men taking hold of properties and working them, as well as by some of the old claim owners, who have never lost faith in the district and who have held on to their claims and are working to develop them. Mr. Barrett is interested with Frank Ruggles, James Roach and J. J. Patton in a number of claims, three of which they are working, viz.: the Mammoth, formerly called the Copperopolis, the Melinda Jane, and the American. The former was at one time worked as a copper mine, but after the failure of the smelter was abandoned, and afterward relocated. It is opened up by nearly 500 feet of tunnels, drifts, shafts, and winzes. The vein is a very strong one, being from six to ten feet wide. The ore carries gold and from five to ten per cent copper. The mine is located in a gulch tributary to Castle creek, where running water is found eight or nine months in the year. The location of the Melinda Jane is west of the Mammoth. Only a few shallow openings have been made along the ledge, the deepest being from eight to ten feet deep. Wherever the ledge has been prospected it shows remarkably rich lead carbonates carrying some silver.

THE AMERICAN.—This is a gold-bearing ledge about a quarter of a mile northwest of the lead claim. This, like the Mammoth, is also a strong vein, and horn-spoons even better than the ore from the latter. A shaft about 70 feet deep has been sunk, and about 40 feet from it another 30 feet deep. These mines are located about two and a half or three miles from the Castle creek smelter, there being a good wagon-road to them.

PURCHASE.—*Silver Belt*, Sept. 21: Mr. Fitzgerald of the International Smelting Co. of El Paso, who recently purchased the Defiance mine in the Turquoise mountains, 30 miles south of Wilcox, states that the mine is to be worked and shipments of ore to El Paso begun immediately. The ore contains about 30 ounces of silver and 30 per cent lead per ton. The sale of this mine is the result of enforcing the payment of duty on Mexican lead ores. Mr. Fitzgerald is negotiating for the purchase of a lead property in Yuma county.

COLORADO.

NO ORE SHIPMENTS.—Elk Mountain *Pilot*, Sept. 20: There is nothing especially new of importance in mining circles here. No ore shipments in our weekly shipping report is a sad state of affairs that there seems to be no help for at the present time. However, there is considerable quiet development going on in different directions that will ultimately lead to our prosperity. The vicinity of the Iron Swamp is still attracting attention and considerable development is being done. A report comes of a gold discovery in the vicinity of Pittsburg. Scott Humason made the discovery, and while we do not know where it is we believe it must be on the west slope of Baldy mountain, the same being the head of Washington gulch. Gold-hunters have for years prospected for the vein from which the placer gold comes. The Augusta concentrator has not got to running smooth yet. Like all mills of the character, it requires experience, patience and perseverance to make a go of it. A Colorado Springs company owns, with Lew Wait, the Voice and Expectation claims, situated in Maroon basin. Mr. Wait will let a contract for 60 feet of work to be done this fall, and hopes to show up an improvement by that development.

SILVER CREEK.—Silver City *Enterprise*, Sept. 21: Frank Vingo, from Silver creek, has for some weeks past been supplying the Sheridan mill with ore from his mine, which mills on an average $30 per ton in silver and gold. At the present time the mill is running 100 tons of ore from the Last Chance, owned by Johnson & Conroy, which will turn out well. As soon as Mr. Vingo gets his new whim in place he will be able to keep the 15-stamp mill running on ore from his mine. The ore body averages from 4½ to 9 feet in width, and is of such a uniform value as to require no sorting. The ore is hauled over the new road a short distance to the Sheridan tram by means of which it is lowered to the mill. The ore is easily milled.

DAKOTA.

PLACERS.—Deadwood *Pioneer*, Sept. 20: Wm. Dunn is placer mining on Strawberry about the Oro Fino and taking out good pay. The gold is coarse and many fine nuggets are found.

PYRITIC SMELTING.—News from the Iron Hill is decidedly encouraging. The smelter was in blast Monday afternoon. Last night reports received by telephone were to effect that everything was working to a charm. One statement was that 75 tons of ore were being put through each 24 hours; this must have been a mistake, however, as the plant has a capacity of but 50 tons. Slag pots are kept constantly full. At present it looks as though the process were an unqualified success.

THE ALBE.—Albe Holmes, in from Carbonate, states there is at present a good deal of mining activity in the camp. The Hartshorn, Spanish R., Iron Hill, Seabury and others are working forces, developing their several properties. Seabury and Spanish R. are steady shippers. On his own claim, the Albe, he is engaged in sinking a new shaft 4x6 in the clear. This is now down 92 feet. When a depth of 100 feet is attained a station will be cut, and drifting for an ore body probably begun, though it is possible the shaft will be sunk to the 150 level before a drift is started.

ORE SHIPMENTS.—Shipments of Golden Reward ore to Omaha, from the dump at the reduction works, continue regularly. Northwestern teams took down a carload yesterday.

IDAHO.

MULDOON.—Wood River *Times*, Sept. 18: Wm. Conners and S. J. Winchester are in from Muldoon attending to the sampling of an ore shipment from the Jupiter and Bay State. If this test is satisfactory the boys will make other shipments this fall. The Jupiter has sent to market 25 tons up to date and has now 3½ feet of ore in the deepest workings. The output of these mines samples from 125 ounces silver and 73 per cent lead to 70 ounces silver and 35 per cent lead. The boys report that their camp is full of low-grade ore, but needs and must have cheap transportation before it will see prosperous days. The Bob Ingersoll is cut into by a tunnel 214 feet. The ore in this mine lays in chutes, five of them having been intersected by the tunnel. The Rippetoe is another promising property in that camp. The ledge is opened by two shafts, one 54 and the other 34 feet deep, and a great number of cuts. The ledge shows ore wherever opened for 600 feet from two to three feet thick, and worth 70 ounces silver and 50 per cent lead per ton. The Tom Payne is a continuation of the same vein but carries a better grade of ore.

COEUR D'ALENE.—Cor. *Oregonian*, Sept. 20: Work is going on in nearly all the mines on Sunset, the Portland M. Co. having started up a few days past. The Goat and Virginia are pushing development and fine ore is reported from both places. A new strike is reported below the Wild Goose, near Toole's spring, a three-foot ledge of carbonates having been opened up. On the Parrot and Colwyn fine bodies of ore are exposed, and some of it is very rich. The Toughnut and Tuscombia are looking splendid, the Toughnut especially, the owners having struck a fine body of high-grade galena ore lately that will pay to ship when the road reaches here. On Nine Mile the California is shipping right along, and some of the others are getting ready to. The Pan Handle is looking fine and promises well with development. The Custer is going ahead and sending along plenty of $100 ore. At Burke the Poorman has declared its second dividend of $20,000, which speaks volumes. The Tiger is "roaring away" quietly. The lower tunnel on the Diamond Hitch has been driven into good ore and the owners are jubilant. The San Francisco and Black Bear are doing splendid in the way of development, large bodies of ore being exposed in nearly all these workings. At the Gem everything is bustle and activity; the concentrator is in shape and running, and the ore is coming therefrom cleanly dressed and ready for market. At the Belle the owners are pushing work on the tunnel, and have a large ledge with plenty of good concentrating ore, while above, at Gray's tunnel, they expect to start up almost any day. The Granite keeps up its lick and carload after carload goes out to market. Considerable work is going on at Placer creek and many fine showings are reported. At Mullan, Charles Hussey has purchased the Evening, and started up his concentrator, which means another hundred tons of ore per day. A great deal of work is going on up there and many miners are employed. Over on the North Side Major Hopkins is developing the Frank Reed property, and report says it is a bonanza. The Mills placers are taking out gold by the pound, so I was told when last at Eagle, a few days ago, while the Golden King and the Golden King mill are working right along on good pay rock, and it is the same with the Golden Chest. The Ophir Hill group are doing well with their arastras, and every week nice bars of bullion are shipped away to Helena, the product of its rich ores. Up near the head of Prichard creek some fine carbonates have been discovered, and many locations have been made this season that promise well for the future. At Myrtle the placers are doing fairly well. They are short of water, but are employing about 30 men. At Pony gulch the Fay Templeton folks are making good large cleanups, the one last week netting close on to $2000.

PRIDE OF IDAHO.—Ketchum *Keystone*, Sept. 21: We were shown a certificate of an assay made last Wednesday of samples of ore from the Pride of Idaho mine at East Fork, which gave the following result: First-class, 175 ounces silver, $7 gold and 62 20-100 per cent lead per ton. Second-class assayed 40 80-100 ounces silver, $7.50 gold and 55 75-100 per cent lead per ton. The latter class of ore Jim Davison says he has been lately throwing over the dump, not knowing the value of it. Mulkey, Taylor and Stuart are working the Olympia mine situated in Bassett gulch, under a lease, and report the prospects very encouraging. Mr. N. C. Barney and son, Alex Simpson and Major Cavanah returned on Tuesday from the Ross valley mines. Major Cavanah speaks very highly of the future prospect of these mines, owned by the Cumberland Mining Co. The most feasible route to the mining property above mentioned is by the way of Ketchum. Ross valley is situated about 10 miles from Sawtooth, from which place a good practical road can be made with but little expense. Ketchum is the nearest point on the railroad to these mines.

LOWER CALIFORNIA.

CLEANUP.—One of the Huntington mills was this month sent to the International Co.'s mines, Alamo, Lower California, and F. S. Sutherland, the superintendent, writes as follows concerning it: "Our 5-foot mill started up on the 12th inst., with Harry Ayres in charge. It runs like a clock, and after five days' work we cleaned up $2160, saving fully 90 per cent on the mill. Very little got on to the plates. We are greatly pleased, and many people who were before prejudiced are now warm in its praise."

BRICKS OF GOLD.—San Diego *Sun*, Sept. 21: Among the passengers on this morning's steamer was L. B. Howard of the Occidental mine near Real del Castillo. Mr. Howard brought up with him a gold brick valued at $3000, which is the yield of a few days' run. This makes $14,000 in gold which the Occident mine has yielded within the past three or four months. Mr. Howard asserts that mining prospects never looked brighter. F. G. Suterland, manager of the International Co.'s mines at Alamo, is in the city. He brought up a $2600 gold brick, the result of the first cleanup from the new mill.

MONTANA.

BIG MINING SALES.—Butte *Miner*, Sept. 21: Great though she is, Montana is still in her infancy, as pertains to the development of her wonderful mining resources, as almost daily some striking proof of this is presented. Tuesday the well-known mine-owner of Southern Montana, Mr. Phil Shenon, sold a group of gold mines at Bannack, Beaverhead county, to the Carlisle Mining Co. of London, England. The consideration is said to be $175,000, and the first payment has been made and a deed in escrow deposited with Clark & Larabie of this city. The company will at once erect extensive works, and Bannack will receive such a lease of life as she hasn't felt since in early days when she was the capital of Montana. As we go to press a special from Bozeman tells of the sale of the Golconda mine, owned by Olds & Hickman, to Cleveland parties for $150,000. A pretty good record for one day.

THE NEW SMELTER.—*Inter-Mountain*, Sept. 21: The coming week will witness a new smelter of the Silver Bow Co. coming into active use. It is located in a very convenient and desirable locality for the mine, and is no doubt the forerunner of a much larger plant. The ore from one level of the Silver Bow mine would keep that smelter concern of only 100 tons capacity in full operation for some time to come, not taking into consideration the other immense properties of the company in the district that could keep just a dozen of its caliber busy all the time.

OPERATIONS AT ANACONDA.—The new smelter at Anaconda, or at least the best part of it, will be in operation in about a month. A tall stack for the purpose of taking all the smoke from the old smelter is being erected on the pinnacle of the mountain. Its present hight is 180 feet, but work will continue till it has reached a distance of 220 feet above the ground. It is 40 feet in diameter at the base. The smoke will then be taken high over the adjoining mountains and not settle down in the city as it occasionally does at present. A stack similar in size will be erected at the lower works of Carroll in addition to the one now in use. Ground has been broken for the new foundry the company is about to erect, that will be built east of town near the foothills. These works will have all the improvements of a first-class foundry, and when finished will be the most complete of their kind in the Territory. At Anaconda a contract has been let to construct a sewer to run through the city in consideration of the sum of $25,000, and ground has already been broken. The sewer will empty into the tailings ditch from the smelter that it may not contaminate the waters of Warm Springs creek.

LOTS OF MEN EMPLOYED.—As for the other mines, it may be said the Anaconda Co. and the Chambers syndicate belt of mines are to-day giving employment to more men than ever before in their history and at and in every conceivable position.

NEW MEXICO.

WITH A HAND MORTAR.—Silver City *Enterprise*, Sept. 21: Harry Apple, formerly of this city, who has a mine in Sierra county, adjoining that of John Fessler, mentioned in this paper last week as taking out $30,000 in a hand mortar, is in a fair way to grow wealthy from his little property. In five months he has taken out $18,000 with one man besides himself. Like Fessler, his mill is a hand mortar, and it is just the thing for such ore.

BREMEN.—Manuel Taylor and partner, who have been working on leased ground in the Baltic for the past eight months, on Thursday of last week struck a body of ore which promises to make them wealthy men. They are now taking out great boulders of ore. McDonald & Stanley, who have the Wagner mill under lease, are now running on ore from the Skillicorn mine, and are saving 85 to 90 per cent of the metal and making a concentrate worth $75 per ton. The mill is doing remarkably well. A new hoist has been ordered for the mine.

STRIKE ON THE COMSTOCK.—The Comstock promises to eclipse herself and help to give Kingston another boom "bigger than the other." A large body of the richest ore ever found in the mine was uncovered last week by F. P. Seidlitz, who has a lease on the south end of the claim, adjoining the Deadwood. Much of it runs into the thousands and covers the whole face of the drift. Three other leasers are also working in ore, and the owners themselves have been constantly taking out and shipping ore for months, or years, as far as that goes. This Comstock strike is certainly the largest we have had in years, if what those say who have seen it is true, yet it creates but little excitement, not so much as the rumor which was circulated last week of the finding of Adams' diggings.

UTAH.

PARK NOTES.—*Record*, Sept. 21: The boiler at the Woodside's new shaft has been set and the hoisting engine is expected to arrive in a day or two. The ore body is holding its own both as to magnitude and richness, and it is pitching downward with every indication of permanency.

THE STEAMBOAT GROUP.—This group, consisting of several new locations way up at the head of Snake Creek district where the Cottonwoods and American Fork meet, is being developed by a force of men under Contractor Springer of Midway. The property is owned by Berry Brothers, Kimball Brothers and other Parkites who propose to run the tunnel until it cuts some of the big ledges known to run through that part of the great mineralized belt.

THE TUNNELS.—The Alliance drain tunnel is in a distance of about 1200 feet, or nearly one-fourth of the entire length to be run. The Ontario three-mile drain tunnel has reached about 2500 feet and satisfactory progress is being made. The McCune tunnel, which is in nearly 1500 feet, still yields a big flow of water and the track is being raised to permit an unobstructed outward flow.

CAMP CROSSCUTS.—The Union concentrator is now working on Alliance second-class ore. First-class ore shipments from the Crescent were resumed to-day, the tramway being in successful operation again. A local geologist and mining expert is seeing his prediction verified. He foretold, when people disregarded his theory, that millions of tons of rich carbonate ore would be extracted from the lime belt up Woodside gulch way.

ORE AND BULLION SHIPMENTS.—During the week the Crescent shipped 80,000 pounds of concentrates. No bullion or sulphides were produced at the Marsac mill this week. The output of Ontario bullion for the week was 31 bars, containing 16,270 fine ounces of silver. For the week just ended the Mackintosh sampler received and forwarded 378,600 pounds of Ontario ore; 308,600 of Daly; 120,700 pounds of Woodside concentrates from the Union concentrator; 93,500 of Mayflower No. 7 leasers' ore; 76,800 of Woodside first-class ore; 48,700 of Macdonald & Girard's Woodside jiggings, and 26,000 pounds of Flindt & Varcoe's Apex jiggings; total, 1,052,900 pounds.

WASHINGTON TERRITORY.

KAOLIN TO BE SHIPPED.—Ellensburg *Capital*, Sept. 20: Walters & Co. have signed a contract to furnish a Tacoma firm kaolin in carload lots, all that may be needed. The deposit is located near Ellensburg and is practically inexhaustible. Its quality is said to be of the very finest and the demand promises to be very great. There is plenty in the Ellensburg deposit to satisfy the demand of the entire Pacific Coast for years to come. Little is known by people generally about kaolin or petunse. It is a variety of clay, used in making porcelain. It proceeds from the decomposition of the mineral feldspar, and is indispensable in the manufacture of fine earthenware.

MECHANICAL PROGRESS.

Positive and Relative Movements in Machinery.

It is a curious fact that while the eye can easily take in the relative motion in a machine, it is almost impossible to get a correct idea of the positive motion of its various parts by simply looking at the machine in motion, and we can only do so by a close application of the mind to the subject. Of course, by relative motion we mean the movement of one part in relation to the other part of the machine, and by positive motion the movement of its parts through space. For example, says a writer in the *Tradesman*, take some of the principal moving parts of the locomotive. The movement of these parts as seen by the eye seems to be the same as in a stationary engine. The follower head moves backward and forward from end to end in the cylinder, the crosshead moves back and forward in its guides, traveling each way the full length of the stroke, and the wrist pin on the driving wheel seems to move in a circle around the center of the wheel, and all of this is true as to the relative motion of these parts. But if we stop here we certainly have no correct idea of the true or positive motion of these parts, for in reality the follower head moves forward to the front end of the cylinder, where it does not stop entirely, but only moves slower until the cylinder is drawn forward over it, when it again darts forward to the front end of the cylinder, as at first, but it never moves backward one particle unless the engine is running backward. The crosshead, of course, has the same positive movement in its guides as the follower head in the cylinder. The wrist-pin on the driving wheel, instead of moving around in a circle, only moves over the segment of a circle, whose length and degree of curvature is determined by the size of the driving wheel and the distance of the wrist pin from the center. This complication of movement is found to a greater or less extent in almost all kinds of machinery. Wherever a moving part of a machine carries with it another part, which has an independent movement of its own, there is both positive and relative motion. Therefore, if the operator would thoroughly understand the machine in his charge so as to get the best results from it, he must not be satisfied with merely watching the relative movement of its various parts, but he must study the positive movement of its parts as well, for, many times, when the machine refuses to perform its work, he looks it over and fails to see anything wrong, and if he has not studied all of its movements, there is much worry and loss of time before the trouble is found, and even then it may take considerable time to get it properly adjusted, because he does not understand the exact movement it should make to properly perform its work.

For the student of mechanical science I know of nothing more interesting and profitable than a close and careful study of positive and relative motion in machinery, both in their separate functions and in relation to each other.

The Blacksmith in Danger.

Machinery has so far superseded hand work in the blacksmith shop that the blacksmith is nearly reduced to horseshoeing for support. This is but the inevitable progress of the age. Our cotemporary of the *Industrial World* in alluding to this matter says: Invention and discovery have accomplished a multitude of beneficial wonders, yet some harm, at least of a temporary sort, is mixed with the good in frequent cases. The invention of printing destroyed the occupation of the copyist; the invention of the power-loom gave the death-blow to employment for hand-loom weavers; and automatic machinery in new lines of industry is constantly modifying, sometimes revolutionizing, the condition of certain classes of laborers. This tendency has long been at work, in a partial way, narrowing the essential qualifications of the blacksmith. Once he needed skill to make horseshoes, horseshoe nails, and sometimes part of his simpler tools. His spare hours used to be occupied in producing a supply of these requisites of his trade. Now they are manufactured by machines, they constitute separate and independent branches of business, and they are furnished ready-made to the hand of the smith, better, far cheaper, more serviceable, than they could be made in the shop. Again he is threatened by innovation, this time vitally. A recent number of London *Engineering* refers to a system of adjustable horseshoes without nails about to be introduced in England, and says: "Again and again new forms of shoes have been put forward, but they were as often pronounced faulty in some essential. It is requisite that a horseshoe that can be applied without the skilled labor of the farrier should be easily adjustable, should require the use of no special tools, should be anatomically suited to the form of the foot, should entail no inconvenience to the horse in his daily work, and should not be liable to set up new dangers or difficulties, as bad, perhaps, as those it was designed to cure. These requirements, onerous and considerable though they undoubtedly appear, have been fully met by a new system of horseshoe." English need of such a contrivance is far greater than American need; for, as a rule, English horseshoeing is a diabolical sort of bungle, superfluously large and cumbersome shoes, secured to the hoofs by nails ungainly in appearance and weighty with metal, by which the horny substance is shattered or split, and the foot at length diseased. Capable veterinary surgeons have estimated that 25 in every 1000 horses in England die some ten years before their time, as a result of lockjaw or other damage inflicted in the process of shoeing. Indeed, the light shoes and dainty nails used by American blacksmiths are the scorn and derision of English farriers, who regard these articles as mere toys compared with their own.

The bare idea of a horseshoe without nails is not new. Ages ago the Japanese made such shoes of straw. Of course, they were not durable, but they seemed to answer the purpose, for they were customary. An adjustable shoe, embodying the same idea on higher principles, would, no doubt, cheapen the keep and increase the working power of horses. A large sum for nails, and loss of time, with cost of attendance to and from the smithy, would be saved. *Engineering* estimates the single item of loss of horse service, in consequence of the necessities of shoeing once a month, at not less than £6,450,000 per annum in England and Wales alone. The aggregate annual earnings of 125,000 farriers are put by the same authority at £6,250,000. Such statistical reckoning must, however, be largely guesswork, because the mere estimater, in making his calculation, is likely to omit important elements of the problem.

If this invention should turn out to be a practical success it must lead to improvements in itself and to other devices of different kinds, with the same end in view. The aggregate result would be to wipe the blacksmith out of existence, just as the hand-weaver has been wiped out. Herein is exemplified the lamentable part of the outcome of inventions which substitute automatic processes for skilled manipulation. The trained mechanic is thereby often reduced to the level of the manual day laborer; nay, even below the level, when a boy or girl is able, after a few hours or days of instruction, to accomplish, in better form, with infinitely greater rapidity, his productive task. In late years this retrograde effect has involved so many classes of mechanics, and inventive genius is becoming so revolutionary in method, that the growing tendency presents a question for political economists.

MULTIPLE STEAM ENGINES.—The movement in favor of multiple cylinder engines is progressing with rapid strides, and nearly all of the new steam mills where power is the prime consideration are placing engines of this description. Many of the existing plants are also being remodeled on a compound or multiple expansion basis. In Fall River the movement is very general, and the shops have a number in process of erection in that city. A notable example will be the engine of the Fall River Iron Works, which will have six cylinders, three on each end of the crank-shaft, running triple. They are also building a number of triples in which four cylinders are used, the final expansion taking place in two smaller instead of one large cylinder. The Narragansett and Richard Borden Mills have engines of this type, the high-pressure cylinder being 20 inches in diameter, the intermediate, 34, and the two largest each 36, with a three-feet stroke. The triple expansion at the Narragansett Electrical Station is well along in the process of erection. William Cramp & Sons of Philadelphia have contracted to build an iron steamer with triple expansion engines for the Metropolitan Steamship Co., the model to be similar to that of three steamers already on the Boston line.

MANUFACTURE OF LARGE SHAFTS.—The history of the manufacture of large shafts is typical. The contracts for the shafts of the Dolphin, Atlanta, Boston, and Chicago, which were to be of steel, had to be modified to allow of the use of iron. For those of the Charleston, the Baltimore, Yorktown, and Vesuvius, recourse was had to foreign makers. The nine-inch steel shaft of the Petrel was forged by the Duquesne Steel Co. Bethlehem undertook those of the Newark, Philadelphia, San Francisco and Maine, and Midvale those of the Concord, Bennington and Monadnock. In large steel castings for stems and stern posts for the later ships, the Standard Steel Casting Co. of Thurlow, Pa., and the Union Iron Works and Pacific Rolling Mills of San Francisco, succeeded in meeting the rigid requirements.

OIL SHIPMENTS across the ocean in bulk affect the iron trade by checking the demand for barrels. It is stated that there are not one-tenth of the barrels made for oil shipments in this country now that there were formerly. Then the daily shipments of barrels were between 45,000 and 50,000, and for such an amount it would take over 250 tons of hoops. A set of six hoops for an export barrel weighs 12, and on a domestic one, 10 pounds. This was enough to keep two large rolling-mills on double turn.

DEVELOPMENT OF THE ENGLISH STEEL CASTING TRADE.—It is said that there has been a wonderful development in England during the past year of the steel-casting trade. For heavy goods steel has to a very appreciable extent taken the place of wrought and malleable iron. This is a branch of trade into which some houses have gone with great energy and complete success.

SCIENTIFIC PROGRESS.

The Shadow of Electricity.

Every one who has used the telephone to any extent has been much annoyed by a buzzing, crackling noise that seriously interferes with his receiving messages from the opposite end of the circuit. This disturbance is caused by what is known as the induction current, and may not inaptly be termed "the shadow of electricity." It is a sort of faint essence of electricity that hangs about every electric wire, and is affected similarly, but in a lesser degree, by everything that affects the current on the wires. Its strength varies with the intensity of the main current and the condition of the weather, but there is always enough of it to be a nuisance on long wires and when delicate work is desired. It seems to gather up and sling fragments of what is passing over the adjacent electric wires directly into the middle of what you are getting over the telephone wire. The cause of this interference is that the induction from a telegraph wire is so strong that it will overcome entirely the weaker current of a telephone wire near it on the same pole and make it impossible to transmit intelligible sounds over the latter when the former is in use at the same time. This trouble is sometimes so great and persistent as to render the telephone circuit useless.

It will be good news to those who make much use of the telephone that a recent English invention claims to harness this faint current to regular instruments and make it work independently of and simultaneously with the main current on the wire. The main feature of the invention appears to be the use at the receiving instrument of two wires insulated from each other, but each attached at one end to the main wire. The regular current cannot communicate through these wires, because they are insulated from each other, but the induction current exists among them, in spite of the insulation, and any impulse communicated to the induction current at any station on the line is faithfully reflected by the induction current over these two wires at the receiving end. By delicate adjustments, similar to those used in the duplexing and quadruplexing ordinary wires, the impulses of the induction current are kept separate from those of the regular current and will carry a separate message from that passing on the main wire. The instrument by which this is effected is called a phonopore.

It is claimed that it will be possible by the use of the phonopore to double the capacity of an ordinary telegraph wire working singly, by simply attaching the new instrument at each end. A duplex wire can be made quadruplex in a moment by the same operation, and a quadruplex wire sextuplex or octuplex. The phonopore may be hitched on at way stations instead of at the end of the line, and works as well and in perfect independence of the main current. It can be put on at a place where there is no regular instrument. Experiments now being made over English railway lines are said to prove conclusively that the invention is capable of easy and profitable use in connection with existing telegraphic systems.

It does not appear, however, that this new English invention is more than an improvement and perfection of the system of telegraphing from moving trains, which has been in use in this country on the Lehigh Valley railroad for some time, and is said to have proved to be practicable and useful. In both systems the induction from regular telegraph lines is used.

The Microbe of the Magnet.

With all the paraphernalia of the modern physical and electrical laboratory, the instruments of precision that will handle a millionth of an inch as readily as a laborer his pick and shovel; with all the evolution going on through generations of scientists, and the almost incessant wresting of secrets from the bosom of nature, we doubt if science is any closer to the isolation or attenuation of the microbe of the magnet.

It is absurd to suppose that a primary energy is impressed upon a piece of hardened steel once for all. The transfer of that energy into actual work would destroy the magnetic power, yet such a destruction not only does not take place, but the very exercise of the power strengthens the magnet. A horseshoe of steel may be magnetized in ten seconds by the current of a few amperes from a battery, a ridiculously small amount of energy all told, and such magnet can lift many pounds of iron in contact. But without contact it may lift and hold a pound of iron easily. It will hold that pound for an eternity, and every second of that time without end the magnet is expending energy until it foots up an almost inconceivable total of actual power. Not alone that, but the magnet of one pound lifting power to day may and will be stronger to-morrow. Where does all this really tremendous amount of energy come from? By what inscrutable process does the mere magnetization of a bar of steel make of it a machine for the transformation of energy? Not a reactionary or storage device, which, like a steel spring, honestly gives back approximately all it has received, but a perpetual transforming or converting machine. There is a hidden process going on of some kind; energy is going into the magnet all the time it is doing work—energy in some form. Where does it come from—gravity? atmosphere? solar rays? earth currents? Who can say? It is a great problem, worthy of a lifetime of indefatigable research. It is a microbe and it will be discovered, and the discovery will make electricity the queen of nature's forces, and steam will become a dim vision of the dark ages of the past.—*Electrical Review.*

Searching for a Soul.

Materialism cannot furnish a more complete exemplification of its spirit and meaning than it did in the case of the three doctors who sought to discover the secret power of Bishop, the noted mind-reader, at the point of the scalpel in the hands of the operator. They adroitly went at their work before the soul could fairly be supposed to have left the body, apparently in search of the soul itself, as if to question it concerning the mystery of its lodgment and the secret of its control. It might perhaps be regarded as a case of vivisection for the discovery of the spirit before it had taken its leave.

They could have sought for nothing more than material evidences of the spiritual functions in the human body, and thus far, though the circumstances were unparalleled in autopsical history, it has not been disclosed that their strange efforts were rewarded with the least success. They made one thing certain, that the man was dead when they got through with him, which is not generally believed to have been the case when they took him in hand.

The preposterous thing about it is that they should have expected to discover the secret of the phenomenon exhibited by Bishop by an examination of material organs of his body. If they did not expect that, then why make the autopsy at all, and why, of all other things, make it in such haste as to horrify every one who has heard of their conduct?

It is a clear case of materialism probing for the living principle which mere materialism need never hope to find. The method pursued, too, was strictly consistent with materialistic theories. It assumed that in spirit the principle of all life is something that can be handled, measured, weighed and treated after a material fashion.

But, happily for us all, life is something that can neither be comprehended nor investigated in a material way. It is not less real either, because it is so utterly elusive of sense. Man is not so low and mean a being as the animal the materialists believe him to be. There are facts in man's existence which none of the so-called scientific theories can ever hope to explain. The materialists might as well try to see with the ear and hear with the eye as uncover the spirit with the scalpel. And a person blind from birth might as well undertake to deny the existence of light and color as materialists to deny the existence of a soul.—*Boston Globe.*

Power of Mind Over Matter.

One cannot help being amazed when he surveys the marvelous effects that the human mind has brought about. In the struggle between mind and matter, the latter has long held the former in a debased state of ignorance and superstition. Man, the highest and noblest offspring of the Universal Intellect, has bowed in submission and awe before the irresponsible agents of nature, and worshiped them.

But the spark of the Divine finally asserting itself, the thinking-power of man soared above the narrow sphere which bound it, and viewed the unintelligent causes of his dread in their true light. Then commenced the work of subjection. The forces of nature, one after another, came under his control; the god of fire, which the Persians so devoutly adored, was unceremoniously metamorphosed into the steam engine; old Boreas had to give up his rule over the sea, and ceasing to control navigation and commerce, entered, with his co-partner, Neptune, into the misty realms of poetry and song. Jupiter with his thunderbolts, by a transit unparalleled in the pages of history, took the less sublime, though immensely more useful, form of the modern electric motor.

One of the most important achievements of the human mind was the invention of working iron ore into definite shapes, to answer definite purposes. That, together with steam, are the two principal factors which brought about the civilization of the present century. Ah, how little James Watt realized the grand issues of the silver spoon he put to the hub of that teakettle of his! How little he thought he was trifling with the spring that was to raise humanity to the high pedestal it now occupies! But, in all probability, steam is doomed to disuse, for electricity is making rapid and unmistakable strides forward. It is obvious that this new force is destined to throw the old one in the dark, and the twentieth century will doubtless witness a grand and radical revolution in regard to motive-power, which may place it on a much higher level in the path of progress than its most sanguine well-wishers imagine.—*Practical Mechanic.*

CURIOUS NOTE ABOUT OIL PAINTINGS.—A freshly executed painting may have its colors presented in the mellow tones of the old masters by first covering the back with a coating of fuller's earth, which absorbs all remaining oil, and then, on removing it, covering the back with a coat of linseed oil, which the colors presently imbibe. This is the alleged discovery of a celebrated French painter.

GOOD HEALTH.

The Health of the State.

The monthly report of the State Board of Health for August shows a most gratifying condition of the healthfulness throughout the State for that month. Reports were received from 120 localities, showing an average annual death rate of only 11.64, which is said to be the lowest death rate ever recorded in the State, and furnishes a most gratifying evidence that the health organizations under the new law are doing efficient work.

Diphtheria and Croup.

The following remarks in the report under the head of diphtheria and croup should be carefully read and remembered:

"The instrumentality of boards of health in educating the public to the dangerous and contagious nature of this disease, and the necessity of strict isolation and complete disinfection of all persons and things in contact with it, has done much to limit its spread, and to their efficient action may we hope soon to be enabled to chronicle the event of its complete disappearance from our midst, as it is a disease as surely susceptible of perfect extirpation as smallpox, if as efficiently dealt with. To do this promptly, there should be a law to compel a notification of its presence in every instance to the health officer, and the premises quarantined by a distinctive flag or printed notice. If we reflect that diphtheria is more deadly than smallpox and more destructive in its ultimate results, it will be conceded that no measures can be too strong in guarding the public against its inroads."

The report concludes as follows:

As the organization of local boards of health and the appointment of health officers is now being rapidly accomplished in obedience to the State law making such appointments compulsory, we would beg to remind all communities so favored that such organizations or appointments can offer no means of defense against the inroads of disease without the active co-operation of the citizens among whom they are placed. We know that the prosperity of a town depends much upon its healthfulness and the safety of life therein; it therefore becomes most important that upon the first appearance of any infectious disease, its presence should be made known to the officers of health, that all necessary precautions may be taken to prevent in the first instance, its spread; secondly, to discover, if possible, its cause; and, thirdly, to take measures to remove or destroy it. Typhoid fever, smallpox, scarlet fever, and kindred infectious diseases need never extend beyond their original point of development, if properly cared for under the instructions of an intelligent health officer. It, therefore, becomes the highest duty of a citizen to co-operate with the officers of health to save not only the community from sickness and their fellow-citizens from death, but also to preserve the good name of their town for healthfulness and sanitary salubrity. "There is no doubt," says a late writer, "that the people themselves are responsible for many of the diseases which afflict them, and when the art of preserving health shall have attained to the same perfection as the means that now exist for destroying it, we may expect a large reduction in sickness and a willingness to be governed by sanitary rules that are now looked upon by a large class of people as interfering with their personal liberty."

Want of Sleep.

Are you afflicted with insomnia? Perhaps you have too much time for sleep; perhaps you depend too much on sleep for rest and recuperation—for sleep is not the sole rest of used-up nerves. Sociability, congeniality and the enjoyment of good company rest the body quite as much as sleep.

The dreary monotony of life in many a household, involving this tumbling into bed with the mechanical regularity of a machine at 9 or 10 o'clock in the evening, does not always rest weary bodies. "Early to bed and early to rise" does not always make a man healthy, wealthy or wise.

Numbers of organizations are capable of only five or six hours' sleep at a time, and their early lying down to rest is often succeeded by an early waking up and a consequent restless tossing for hours preceding daybreak. The practicers of punctuality are often surprised, after breaking their own cast-iron rules and passing two or three later hours of mirth and jollity past their usual bed-time, to find themselves even more refreshed than usual in the morning. The relaxation of sociability has rested them more than would sleep or an attempt to sleep. But these are conditions not so easily reached in the average family.

In fashionable life we have a formal, exhausting and mechanical evening of more or less dissipation. On the other hand, the evenings of great numbers of families are monotonous humdrum. They involve the assemblage of the same people, the same surroundings, the same paterfamilias yawning over his paper, and the same querulous mamma overladen with family cares. Fresh people with fresh thought, fresh atmosphere, anything to stir up and agitate the pool of domestic stagnation, are sadly needed and sadly scarce. There needs to be also a constant succession of such fresh people to bring about these results. The world is full of men and women, and in a better regulated life it would be the business, after the day's work was done, to entertain each other and give each other fresh life. As it is now, hundreds and thousands of our households are little better than cells for the incarceration of each family. Thousands are thus worn out prematurely from the utter lack of domestic recreation. There might be written over the graves of thousands: "Bored to death by the stagnation of domestic life."—*The Christian at Work.*

REGULARITY OF HABIT.—One of the most difficult of all minor habits to acquire is that of regularity. It ranks with that of order. The natural inclination of most persons is to defer work to be done until the last possible moment, or to put it off to another time, where this can possibly be done. Yet habits of regularity contribute largely to the ease and comfort and health of life. A person can multiply his efficiency by it. We know persons who have a multitude of duties, and who perform a vast deal of work daily, who set apart certain hours for given duties, and are there at the moment, and attend rigidly to what is in hand. This being done, other engagements are met, each in order, and a vast deal is accomplished, not by strained exertion, but by regularity. The mind can be so trained to this that at certain hours in the day it will turn to a particular line of duty, and at other hours to other and different labors. The very diversity is restful, when attended to in regular order. But let these run together, and the duties get mixed, and what before was easy is now annoying and oppressive, and the exact difference between many is at this point. There are those who confuse and rush, and attempt to do several things at once, and accomplish little, while others will quietly proceed from one duty to another, and easily accomplish a vast amount of work. The difference is not in the capacity of two men, but in the regular methods of the one, as compared with the irregular and confused habits of the other.

WOOLENS FOR SUMMER.—A physician who has for six months tested Dr. Jager's plan of wearing nothing but wool day and night, writes to the *Lancet*: "The result has been complete immunity from colds and a very marked increase in my capacity for work. I have not put on a great-coat night or day, have slept with an open window in my bedroom, and have been able to enjoy the luxury of an open cab instead of a close brougham. Instead of alternate feelings of heat and cold, there has been a uniform and most agreeable glow of warmth. I have, without any alteration of diet or regimen, lost seven pounds in weight, and (which will, I believe, tax the credulity of some) have witnessed the disappearance of a lipoma of the nape of the neck, which had existed for some years and had suggested the necessity for an operation. These latter facts powerfully illustrate the truth of Dr. Jager's contention that the complete and continuous action of the skin drains the organism of water and superfluous fat. I would say, further, that the feeling induced of perfect health is not the least of recommendations to adopt the system. I may mention that of the many who have, more or less, fully addicted themselves to it from my example or advice, I have not known one who has been disappointed. Lastly, I would add a word on the need there is, if the full benefit to be derived is wished for, that nothing but pure wool should enter either into dress or bedding."

USEFUL INFORMATION.

The Beer Industry.

There are ten breweries in the world which sell more than 250,000 barrels of beer each year. Five of these are located in the United States and five in Europe. The largest of the ten is the Anheuser-Busch at St. Louis, which sells 465,193 barrels a year. Two of the five American breweries are in Milwaukee, one in New York and one in Philadelphia. The St. Louis Brewery employs 2200 men and consumes annually 1,220,000 bushels of barley. The glass industry depends largely upon beer for prosperity. The St. Louis Brewery uses over 27,000,000 bottles a year. Yet this is only one of the five largest in the United States, and the number of smaller ones runs into the thousands. There are 27 in San Francisco, which does not take high rank as a consumer of beer.

Lager Beer as a Beverage.

When lager beer (which signifies a beer which takes time to perfect) was first introduced here, it was hailed as a panacea for the evils of strong drink. When properly made of pure barley, malt and hops, and kept for at least a year before tapping, it certainly is one of the best of fermented beverages, and so made and kept it is comparatively non-intoxicating and gently stimulating. With this idea our American public, who never do anything by halves, soon acquired a taste for it and to such an extent that it may now be called a national drink. So great has been, and is, the demand that brewers are using materials other than malted barley, such as corn and oats, etc., mixed with barley and hops, by which they accelerate its manufacture, making a sweetish, pleasing, heady beverage, but alcoholic; and the use of this kind of beer, in large daily quantities, with the idea that it is innocuous, has brought on a marked increase of renal complaints, so much so that many eminent physicians declare such beer more dangerous than the use of whisky, for the free use of such beer is found to produce a species of degeneration of all the organs, profound and deceptive fatty deposits, diminished circulation, conditions of congestion and perversion of functional activities, and local inflammations of both the liver and kidneys are continually present.

RELATIVE INCREASE OF POPULATION AND INDUSTRIES.—Assuming that the most reliable statistical estimates are reasonably correct, the population of the United States is 65,000,000. The increase since the last census is believed to be about 30 per cent. With this 30 per cent increase in population as the basis, it may readily be seen what industries are going ahead of the ratio of increase in population and what falling behind. Wool-growing, for example, falls behind. The increase in nine years has been but 17 per cent. The woolen manufacture, which has been represented as depressed, has increased 30 per cent. The consumption of cotton by home manufacturers has been 31 per cent. The wheat acreage has not increased in proportion to the increase in population. Iron production has gone ahead, the increase being about double the ratio of increase in population. Cattle have increased in numbers about 47 per cent in spite of the impression that there was a relative decrease. The railroad mileage has grown from 90,000 in 1880 to 150,000 in 1889. The increase is much in excess of the increase in population and is possibly in excess of the needs of the country.

MAKING ARRESTS.—Neither a private nor a public detective can arrest a criminal without a warrant and have the privilege to lock said criminal up in jail in any county in the State, where he is arrested, until the criminal is brought to where he is wanted. Every citizen, of course, has the right to arrest a person in the actual commission of a crime, but having been arrested the prisoner must have as speedy a hearing as the circumstances allow, and a complaint must be filed and sworn to to hold him or else the law steps in to give him his freedom. But private detectives have kept prisoners under detention without warrant issued by a magistrate, and in such a case the private detective has protected himself, as he thought, against prosecution for civil damages by having his prisoner sign a paper that his detention is voluntary. If the arrest is an honest one of a fugitive from justice, and not for speculative or other purposes, there is no need for secrecy in the matter of the incarceration.

IT has been said that all the money which the world possesses to-day would only purchase one-third of its railways, since the railroads in the world are worth nearly thirty billion dollars. In comparison with this sum the amount of money invested in banking throughout the entire world is but a trifle. The railroad business is one which is increasing at an almost incredible rate of speed. In 1875 the world's railways aggregated 185,000 miles, while in 1885 there were over 300,000 miles of railroad, thus showing an increase of 115,000 in ten years, or, on an average, upward of 11,000 miles a year. When it is considered that this would mean the laying each year of railway enough to reach nearly half around the earth, the magnitude of the increase can be in a measure appreciated.

THE RATE OF INTEREST is gradually decreasing in this country, as has been demonstrated by heavy financial transactions during the past few years. Only a few years since this Government was glad to pay six and seven per cent; now a Government bond bearing three and four per cent is eagerly sought for by investors. New York City has placed $7,500,000 of bonds on the market at 2½ per cent, and they were quickly taken; and in fact a small premium was paid for some of these, which is certainly remarkable, and shows that there is immense wealth seeking safe investments and that the credit of New York City is good. British consols bear 2⅞ per cent interest, and most people have laughed at the idea of offering securities bearing less than three per cent, but this achievement of New York will doubtless encourage other cities to attempt the same thing.

A TEST FOR TEA.—A Russian analyst gives the following as a test by which tea can be proved to be genuine or not: Take a pinch of tea in a glass, pour upon it a little cold water and shake it up well. Pure tea will only slightly color the water, while a strong infusion is quickly got from the adulterated or painted leaf. Now boil both sorts separately, and let them stand till cool, and the difference between them will be most marked. The false tea will become still stronger after a long standing, but will remain transparent, whereas pure tea will become muddy or milky. This last appearance arises from the tannic acid, which is a natural property in pure tea, but which in artificial tea is entirely absent.

AMERICAN PLATE GLASS.—The great advance made by American manufacturers of plate glass for glazing purposes has finally succeeded in completely shutting out from this country the foreign-made article. The last English branch importing house in New York has recently been closed out.

THE beet-sugar factory at Watsonville is now running day and night.

ELECTRICITY.

Electricity Has Come to Stay.

Steam is good so far as it goes, but the time will soon come when it will be unable to cope with the demands made upon it, and will leave the field like a disabled giant, to be replaced by electricity; and, indeed, there is no reason why it should not answer all purposes in a much more satisfactory manner than steam does.

We often hear people denouncing electricity, as attended with terrible risk to human life, but is it really more dangerous than steam, or indeed such simple necessaries of life as gas, kerosene oil, etc.? To urge this argument would be as absurd as to object—which many are fond of doing—to a life on the ocean wave, on account of the dangers attendant. It may be rather risky, but can we think of any vocation in life that is not fraught with melancholy possibilities? To my mind, there is much more probability of a boiler bursting and sending those around it with one stride into eternity than there is of a similar calamity happening by the mismanagement of electricity. A large per cent of the conflagrations occurring in factories and workshops are directly or indirectly due to the boiler-room fire. A system of producing power that will dispense with this danger must surely be a boon to the manufacturing world, to say nothing of the sanitary improvements arising from the discarding of a dirt-breeding steam boiler with all its other nuisances.

One of the most serious objections to electricity is its supposed greater cost than steam. Those who make that argument, as a general thing, suppose that each shop must generate its own current, but electricity as a motive-power is now mostly produced in large quantities and then distributed by means of wires to many shops, just as is the case with electric lighting.

Another of the advantages offered by the use of electricity is the possibility of bringing it perfectly under control and subdividing it in any quantities necessary. A small motor can be attached to every piece of machinery in a large factory room, enabling the operator to instantly disconnect the current, if he finds it necessary, without in the least interfering with any other machine in the room.

Having the advantages of a lesser cost, being much safer than steam and not so injurious to health as that power, electricity cannot but come into universal use.

ACTIVITY IN ELECTRICAL CIRCLES.—It is a question whether all the electrical-supply houses fully appreciate what a banner year 1889 is going to be for their business. Up to July 1st contracts had been closed for the installation of electric plants that will require a total amount of supplies far exceeding the aggregate of any previous six months, and the prospective plants for which bids have already been tendered, or will shortly be called for, and which will certainly be in operation before the new year, will make the total amount of material required and used run up into figures that will surprise every manufacturer and supply man. Already there is complaint in the East of the immediate scarcity of poles suitable for erection on residence streets. A large stock of insulators have been secured, but it is probable that contractors will experience some delay in securing shipments before the year ends. There has been a scarcity of certain sizes of copper wire every fall during the past four years, and this year will prove no exception. This great demand not only affects the manufacturers and dealers in line-construction material, but has also increased the activity among the makers of steam plants and all thereto pertaining, as the older lighting plants are rapidly extending their circuits, and requiring in certain cases several hundred horse-power extra per plant; the smaller towns of 1500 or 2000 inhabitants are demanding electric lights; in the larger cities extensive electric motive-power plants are being constructed, and in many cities of all sizes the street-railway companies are rapidly adopting an electric-motor system.

ELECTRICIANS are still finding new fields of employment for the subtile fluid. The latest is a new method of communication. By it a man can sit at his desk in New York and the letter he writes with the electric pen is instantaneously reproduced in Boston, St. Louis, Chicago, or any point with which he wishes to communicate.

THE LARGEST DYNAMO which is now in existence is in this country, but Great Britain counts on having a larger one. It is being made for the new electric-light works at Deptford. The shaft of the machine will be turned out of a block of steel weighing 75 tons, which has just been cast in Glasgow.

LETTERING IVORY.—A process of lettering bone or ivory by sinking the letters into the material in a permanent fashion has recently been introduced. These ivory plates are taking the place of engraved metal plates for signs, checks, badges, and so on. Electrical engineers have also adopted the new plates, which can likewise be applied to organs and pianofortes.

LONG-DISTANCE TELEPHONING.—Telephonic connection between Chicago and Milwaukee, a distance of 90 miles, is in successful operation.

MINING AND SCIENTIFIC PRESS

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Our latest forms go to press on Thursday evening.

SAN FRANCISCO:
Saturday, Sept. 28, 1889.

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Passing Events.

The Golden Gate river-bed mine, above Oroville, recently described in the PRESS, was this week pumped out and mining has commenced. The big flume carries all the water of the river, leaving the bed bare. They may be able to work the whole bed out this season.

The lead miners are not having it all their own way about those free Mexican lead ores. The Board of Trade of Kansas City, as well as the miners of Deming, N. M., have adopted resolutions asking that the ruling which admits these ores be continued; they say that the import duty on lead ores would cripple smelting enterprises. It was doubtless the smelting industry that was instrumental in obtaining the ruling so objectionable to lead miners.

The failure of the Big Bend Tunnel enterprise, with a loss of $2,000,000, is rather a bad setback to river-bed mining on any large scale. It cost so much to remove boulders that no money could be made. Still, at almost any place, rich spots might be struck in the river-bed, and because such enterprises fail in one place it is no reason they will in another.

Monterey county is just now excited over its "lost mine," which is said to have been found at last. A legend about this "lost mine" is one which has long prevailed, not only at Monterey but in many other parts of the country.

THERE is talk of an electric street railroad at Ukiah, Mendocino county, the dynamos to be run by water-power.

The Position of Copper.

European mail advices just to hand give the statistical position of copper less satisfactory, and this, too, in the face of the increased consumption and deliveries in last month. Although the stocks were reduced, yet they were not to the same extent that marked it the two preceding months. Probably the advance in the price of copper tended to augment the supplies, but as the price has since gone off, it is not at all unlikely but they will again decline. According to James Lewis & Sons' ore and metal report, the average prices of bars were as follows in the following months: August, 1884, £53 15s.; August, 1885, £42 10s.; August, 1886, £39 5s.; August, 1887, £40 3s. 9d.; August, 1888, £89; June, 1889, £41 5s.; July, 1889, £42; August, £43 5s.

From the highest point reached in last month the English market fell below £42, which clearly shows that dealers had less faith in the situation, and it must be admitted that the statistical position justifies their fears. The following compilation in tons gives the situation in a compact form:

1889.	Stocks.	Supplies.	Deliveries.
February	118,140	10,009	1,397
March	124,876	11,135	4,399
April	124,447	8,080	8,509
May	117,420	6,837	13,864
June	111,689	4,758	10,489
July	108,116	9,716	13,289
August	105,985	11,792	13,923

It will be seen by the above that while the consumption increased from 10,489 tons in June to 13,923 tons in August, the supplies increased from 4758 tons in June to 11,792 tons in August. According to James Lewis & Sons' circular, in the increased supplies, all countries except Australia are represented. With such a showing it is but natural for consumers not to anticipate their wants to any great extent, well knowing that unless the output is curtailed, holders of large blocks in Europe will grow suspicious and force sales even at a lower range of prices. In commenting on the present situation, James Lewis & Sons of London under date of Sept. 1st say:

Negotiations for the settlement of the claims and lawsuits of the mining companies against the Comptoir d'Escompte have continued. The obstacle appears to be the return which the liquidator of the Comptoir d'Escompte is to make to the mining companies for the abandonment of their claims—if a money payment, how the money is to be raised. An offer has been made by him to guarantee the gradual realization of the present stock, handing over to the mining companies one-third of the amount realized over and above that for which the copper is pledged (which is not stated), the companies, on their part, undertaking not to increase their production. It appears that the claims of three companies for copper delivered and not paid for amounts to 4,000,000 francs, or £160,000.

PURCHASING SILVER FOR COINAGE.—Secretary Windom has discontinued the custom of making counter-offers by the Treasury in the purchase of silver for use in the mints. This custom was introduced by Treasurer Jordan, who was unfriendly to the silver interest, for the purpose of keeping the market price as low as possible. The law provides for the purchase of a certain amount of silver during the year at prices not exceeding the market price at the time of purchase. The Director of the Mint receives every day a cable from London giving the market price for silver there, and from that is figured out the parity. For instance, the parity by the last report is 93.60, and no price above that can be paid unless there is an increase in the market value. Offers of silver are received twice a week by the Mint, any of which may be accepted if the price asked is not more than the parity. Jordan, in order to get silver at the lowest possible price, inaugurated the custom of making a counter-offer lower than the price asked. It is now held it is not proper for the Treasury to go at it systematically to "bear" the silver market.

THE PATENT OFFICE.—The annual report of the Commissioner of Patents shows the number of patents applied for the past year was 36,740, and issued 21,518, being a slight decrease in the number issued compared with the preceding year. The receipts of the office were $1,186,557. An increase in the salary of the principal examiners is asked for.

THERE is trouble at the carbonate camp of San Pedro, N. M., over an order of the superintendent of the big copper mine to the foreman, instructing him to employ only Italian miners, virtually discharging the others.

An Extraordinary Power Equipment.

The Pelton Water Wheel Company of San Francisco has recently furnished the Treadwell mill of Alaska a power equipment presenting many very interesting features.

The mill referred to is the largest quartz-mill in the world, consisting of 240 stamps, 96 concentrators, 12 ore crushers, etc., requiring about 500-horse power. All of this machinery, covering several acres of ground, with its vast complication of counter-shafts and connections, is now run by a single Pelton wheel, 7 feet in diameter, operating under a head of 490 feet, making 235 revolutions, and using 630 cubic feet of water per minute, which is discharged through a nozzle 3.31 inches in diameter. With a 4-inch nozzle this wheel will work up to 735-horse power.

Perfect regulation is afforded by the use of a deflecting nozzle, operated by a hydraulic governor. This is a nozzle about 4 feet long, with a ball joint at the butt end. To the discharge end is attached, by lever connections, an automatic hydraulic regulator, which varies the amount of water applied to the wheel as may be needed to adapt it to varying loads. This device has been generally adopted by the Pelton Company, as affording the most simple, sensitive and satisfactory regulation, both for general machinery and electric-light purposes.

Comparisons are often made at the East between the advantages of steam and water power. As applied on the Pacific Coast, water has so much the better of steam that the latter is not to be thought of where water is available. A striking instance of this advantage is here afforded. The wheel above referred to weighs but 800 pounds, and the entire equipment, embracing shafts, boxes, driving pulley, etc., only about 4000 pounds. A steam machinery plant, to give the maximum capacity of this wheel, would not weigh less than 200 tons. The expense of operating such a plant would run well into the thousands every month, while the cost of running the Pelton wheel is merely the oil needed for the journal bearings.

Included in the above equipment was also an 8-foot Pelton wheel, to drive a 15-drill compressor, requiring 175-horse power. Also two small 18-inch wheels to run dynamos, which light the entire works. Probably no such amount of power was ever before furnished at so small expense, both as to first cost and that of maintenance. This mammoth mill affords a fair illustration of the modern methods of mining, and of how low-grade ores can be made to pay large dividends.

The Big Bend Failure.

One of the largest river-bed mining operations even undertaken in this State was that of the Big Bend Tunnel Co., Butte county. A few years since we gave a detailed description of the undertaking, with illustrations. The work involved the cutting of a large tunnel, 12,000 feet in length, through which the river was to be turned, leaving the natural bed dry so it could be worked for the gold. The scheme looked feasible enough, as large amounts had been taken from other portions of the river-bed near by in early days, when unusual low water permitted work.

The result has not been satisfactory, however, and a loss of some $2,000,000 has been entailed, mainly falling on Dr. R. V. Pierce of Buffalo, N. Y., the principal stockholder. The tunnel constructed to divert the river was a success, but when the river-bed dried it was found that the work, so far as prospecting at the gold deposits was concerned, was [illegible]egun. The bed of the river was covered with innumerable bowlders, and it was a losing task to secure the gold. One gang of men would strike a rich find, but another would work away at bowlders and eat up the profits of the finds. It is hardly probable that anything further will be done in the way of mining, and the only revenue that will be got out of the property will come from the sale of a tract of land, some of which is valuable, including hundreds of acres of good timber.

In the official bulletin announcing the failure of the scheme, Dr. Pierce says: "But after all our efforts, and much as we regret to acknowledge the fact, yet we are quite prepared to admit that at present we see no prospect of realizing our former expectations with respect to these mines."

Foundry Notes.

Business is rather dull among the foundries just now, as is usually the case at this time of the year.

On Saturday night a fire broke out in the pattern shop of Weed & Kingwell's foundry, entailing a loss of about $2000.

The Oakland Iron Works suffered a loss of about $10,000 by fire on Sunday morning. The principal loss was on machines, tools and designs. There are 20 men employed at these works.

The Union Iron Works have sent the cruiser Charleston to Mare Island navy-yard for acceptance by the Government authorities. She was towed up on Tuesday of this week. Work on the San Francisco is well along, and the vessel will probably be ready for launching by the end of next month. There will still remain considerable to do on her, however, after she is afloat.

Frank A. Huntington has established himself in much roomier and more convenient quarters at No. 213 First street. The new shop is well lighted and arranged for facilitating work. The machine shop fronts on the street, and in the rear is a good-sized foundry, fully equipped. To one side of that is the pattern shop and draughting-room. There is also a large sales-room fronting on First street, partitioned off from which are the bookkeeper's room, office, and a special room for consultation with visitors. Since Mr. Huntington's business increased in the manufacturing of Huntington quartz-mills and other specialties, it became necessary to have enlarged quarters; so the old place on Fremont street, where he has been many years, was given up. At the new shop he has put in all the necessary tools and appliances to do all of his own manufacturing. The sale of Huntington mills is constantly increasing, and they are now being sent to mining regions all over the world.

Rock Filling in Mines.

In the Menominee range mines, Michigan, they have had four distinct periods in mine work, beginning with open-pit works, followed by irregular timbering, then the Nevada system of framed timber, and ending with the present plan of rock filling. Where the hanging-wall is of soft clay slates, as in the West Vulcan, softening rapidly on exposure to the air the timbering was not satisfactory; so the modern method of rock filling has been adopted.

The drawings of the West Vulcan mine exhibit the general posture and westward pitch of the ore deposit. At the eighth level the ore is 600 feet long and the average thickness about 25 feet.

The longitudinal section exhibits the "levels," with the method of working the stopes and removing the pillars. This mine is operated by a shaft and a skipway or slope, as shown on the cross-sections. The large new shaft is 665 feet deep to the ninth level. The western pitch of the ore is clearly shown on this section.

The cross-sections looking west show the dip of the ore body down to the ninth level, now the working level. Cross-section *B* shows the main shaft in the hanging-wall.

The timbering, mainly after the Nevada system, has been carried to the eighth level. Rock filling is now being used in the ninth level, from which 130,000 tons of ore were mined last year. The system of rock filling, as described in a paper by Mr. Jno. Fulton before the American Institute of Mining Engineers, will be more fully given in next week's PRESS.

CENSUS AND MINES.—The superintendent of the Census has appointed Richard P. Rothwell of New York chief special agent for the collection of gold and silver statistics for the eleventh census. Mr. Albert Williams, Jr., formerly of this city, will be one of his assistants in the field. The superintendent of the Census also appointed Mr. Baird Halberstadt of Pittsburg, Pa., as special agent to assist in the collection of coal statistics.

THE "lost mine" in Monterey county, at the head of the Carmel river, is again reported as found, and a number of miners are on the ground. This famous mine has been "found" many times in the past 20 years. This time it is an old deserted tunnel which [illegible] given rise to the story.

The Broken Hill Silver District.

The great success that the Broken Hill Proprietary Co.'s silver mine has proved, and the enormous dividends it is now paying, attract much attention in this country. In fact, there is no other silver district being so actively and successfully developed as this one of the Barrier Ranges in New South Wales. One can reach it now by rail from Sydney via Melbourne and Adelaide, a distance of 1418 miles. All the mines and works are in the limits of the town of Broken Hill, which has a population of 13,000. Broken Hill, with its buildings, furnaces and business like air, leaves an impression as a place more like a city than a mining camp, although it is situated in an arid waste and droughts last for years at a time. For a few successive years past they have had sufficient rains to fill the reservoirs, which were constructed as storage for winter rainwater. This water is filtered and used for drinking purposes. We are informed that a local water company, called the Nolans Stephens Creek Water Supply Co., is laying pipes and expects soon to furnish an abundance of water for all purposes.

Eighteen months ago great excitement and lively speculation extended all over Australasia, the central point of the speculation being directed to the Broken Hill Proprietary Co.'s mine. It was the Central Broken Hill Silver Mining Co.'s mine, adjoining the Proprietary on the south, that set this great silver boom in motion by very rich silver ore that was then discovered. In the June 9th issue of last year cautionary remarks were addressed to our neighbors of Australia warning them by our own sad experience against the probable effects of the speculation in the mines and shares then raging in that country. The collapse of the boom, as stated in a subsequent issue of July 21st, was more disastrous and sudden than anything that had ever occupied the mining world. The nominal value of mining shares in this mining district alone depreciated to the extent of $40,000,000. One instance of the many wild cats floated during this great boom may be mentioned the Beltana Broken Hill mine. This property, although not in the Barrier district, was subscribed for right in Broken Hill. Beginning at £1 paid, they advanced by great strides, and within three months from the time the property was floated, sales had been effected for sums as high as £3000.

Of course those that realized by these prices made magnificent profits, but those holding their shares found themselves possessed with just so much valueless paper. The "wonder," the most remarkable silver mine now known, the Broken Hill Proprietary, continued to pay its regular monthly dividends of 30s. per share under the able management of Mr. W. H. Patton, formerly of the Comstock, Nevada. During the boom, the shares of this mine sold for £290 each, giving a return on the investment, even at this figure, equal to 6¼ per cent per annum.

In addition to our remarks in the last issue it may be stated that since this mine started active operations four years ago, it has produced £2,165,274 worth of silver and lead, and more than half was turned out during the last 12 months. As this indicates, the annual increase in the production has been marvelous.

In 1885–6 the value of the ore raised was £44,500; in 1886–7 it took a great jump to £361,700; in 1887–8 the value was £660,700; and in 1888–9 the million was exceeded, the figures being £1,098,000. This rate cannot, of course, be increased, yet by information received from that district we learn that the annual increase will be for many years to come. The mine has now nine furnaces in full blast, and, owing to increased developments of ore, it is found expedient to erect a tenth furnace with 80 tons capacity. The great fissure lode rises into hills and ironstone ridges, as it does 20 miles away from the hum and roar of the furnaces at Broken Hill. The ore is of a free-smelting nature, containing sufficient carbonate of lead, iron and manganese to admit of easy treatment and little trouble in fluxing. The bulk of the ore is forwarded to furnaces, but there are bands and seams of silicious matter which requires treatment by concentration.

One peculiar feature in this great lode was the discovery of rich kaolin ore, in which silver was previously seldom known to exist. Again, in this district silver is found in the form of chloro-bromide and iodide *below* the water-line. This fact has tended to upset the theory of mining experts and scientists that chloride of silver did not exist below water-mark. Again, sulphides are found *above* the water-line. In the Proprietary mine, the "Big Mine," as it is commonly called, they have one ore body 160 feet in width of payable ore, and now comes from good authority by last Australian steamer, that in one place in their mine is a width of 220 feet, with no sign of the east wall, the ore averaging over 70 ounces silver and 40 per cent lead. There is reported over a mile of continuous ore. One mine below the Proprietary has 1300 feet continuous pay ore from 10 to 100 feet wide, and reported 25 per cent lead and 20 ounces silver. It may be stated that in that district 30 ounces ore will return a profit of £1 per ton for shipment, and that 36 ounces ore means a net return of 30s.

Following are the mineral exports from Broken Hill for the week ended July 15th:

	Tons.	Cwt.	Qr.	Lb.	Value.
B H Proprietary, 16,950 bars, argentiferous lead	845	10	2	16	£29,112
Block 14, 4050 bars argentiferous lead	154	0	0	0	4,050
Block 14, lead ore	54	0	0	0	324
South, 11 trucks silver lead ore	65	7	1	0	327
North, 30 trucks silver-lead ore	179	9	0	0	898
Junction, 33 trucks silver-lead ore	185	15	1	0	1,860
Total value for the week					£33,271

The Muir Glacier.

On this page are given photo-facsimiles of the Muir glacier and an iceberg, Alaska, and on page 242 is a description of the scenic wonders of the Alaskan coast. The trip to our northern waters is one now frequently made by tourists, the travelling accommodations being very convenient and inexpensive. One may go from here by rail to the waters of Puget sound, and from there by steamship to Alaska. Most of the voyage is by the inland passage through the straits, sounds and channels, so there are none of the inconveniences of an ocean voyage. For only a very short distance does the steamer pass through the open sea. The round trip is all made within a month. From a perusal of our correspondent's letter, published in the issues of this and last week, an idea will be gained of what is to be seen on a trip to Alaska.



LARGE ICEBERG IN ALASKAN WATERS.



THE MUIR GLACIER FROM THE MORAINE.

Films on Gold.

Anything which creates films and prevents perfect contact between the metals, renders the gold non-amalgamable. The formation of films and other causes which prevent amalgamation, may be accounted for by the presence in the battery of certain soapy varieties of powdered hydrated silicates of magnesia, or alumina, grease, urine, decomposing animal or vegetable matter contained in impure water, or water impregnable with sulphureted hydrogen, or containing certain soluble metallic salts. Water obtained from mine-pumpings, or that which flows over tailings pits to deposit slimes and is then used again, is not always good to use in a gold-mill. It often becomes charged with sulphuric acid and acid sulphates. When this acidulated water is used in a battery many complicated reactions may take place.

Mr. Wm. Skey, analyst to the Geological Survey of New Zealand, when writing on the reported loss of gold in the Thames field, gives the following as the result of his researches:

That numerous samples of bright, clean gold of all degrees of fineness refuse to amalgamate on any part of their natural surfaces, though taken direct from the ledge and untouched by hand.

That on such surfaces sulphur is always present.

That native gold in a pure state readily absorbs sulphur from moist, sulphuretted hydrogen or sulphide of ammonium.

That surfaces so affected refuse to amalgamate, though no apparent change can be observed in their aspect.

The action of sulphuretted hydrogen on gold in rendering it non-amalgamable when placed in contact with mercury was demonstrated with striking effect. From these results the author has been led to suppose that a large area of the natural surfaces of native gold is covered with a thin film of an auriferous sulphide, and that the greater part of the gold which escapes amalgamation at the battery is represented by that portion of this sulphurized gold which has remained unabraded during the process of milling or extraction from the ledge; the state of the gold rather than the mercury, therefore, being the greatest impediment to thorough amalgamation.

That this absorption is altogether of a chemical nature.

The Eiffel Tower is as notable a financial as an engineering success. The shareholders have already received back three-fifths of their capital invested, and it is not unlikely that the entire amount will be repaid before the exhibition closes, leaving the remainder of the 20 years for which the concession runs to earn interest on money which can be profitably employed elsewhere.

NOT DEAD.—Eastern papers appear to be cultivating the notion, says the Homer *Index*, that Nevada is not only dying, but is actually dead. Don't be afraid. The "battle-born" State is yet in its bib and tucker. Let Congress say that silver shall have a fair commercial value, and Nevada will at once jump to the highest plane of prosperity. She will then be intersected by railroads, and places that are now arid wastes will be alive with thriving settlements. Many a dead old mining camp will come to life again when its product becomes worth something more than pot metal.

PREPARATION FOR REBRONZING GAS FIXTURES.—A convenient preparation for rebronzing gas fixtures is made by mixing bronze powder with any transparent varnish—say amber, gum, damar or copal. Do not mix more than you are going to use at once, because most bronze powders act as powerful driers, and what you have left of the mixture soon becomes hard and use less. It is best to put a little of the varnish in a small, flat saucer, and some of the loose powder next to it, and mix with the brush while you are using it, as a painter mixes colors on his palette.

NEW JERSEY GOLD.—The village of Irvington, three miles from Newark, N. J., has a gold discovery boom. James Murray, a laborer, while excavating on a road found a ledge of rock containing gold. Judging by samples, the rock is said to be worth $60 a ton.

DELINQUENT SALE NOTICE.

Gray Eagle Mining Company—Location of principal place of business, San Francisco, Cal. Location of works, Placer County, Cal.

NOTICE.—There are delinquent upon the following described Stock, on account of assessment (No. 14) levied on the 13th day of August, 1889, the several amounts set opposite the names of the respective shareholders, as follows:

NAMES.	No. Certificate.	No. Shares.	Amt.
Brown, G A	463	100	$ 4 00
" G A, Trustee	464	5,000	200 00
" " "	465	2 500	100 00
Bowers, D	379	20	80
"	404	500	20 00
Bogart, O H, Trustee	436	100	4 00
" " "	437	100	4 00
" " "	447	5,000	200 00
" " "	434	200	8 00
" " "	435	200	8 00
Colton, A O, Trustee	243	100	4 00
" " "	244	100	4 00
Durning, T G, Trustee	231	440	17 60
Ettlenger, Isaac	137	600	24 00
Francis, H L, Trustee	444	1,500	60 00
Horton, Thos R	61	5,000	200 00
" " Trustee	315	5,000	200 00
Hall, Wm E	131	900	36 00
"	154	1,000	40 00
" Trustee	411	200	8 00
" "	412	200	8 00
Hall, H E, Trustee	372	1,000	40 00
Nash, H W	269	104	4 16
Nicol, Duncan, Trustee	462	2,820	112 80
Shankland, Robt	144	600	24 00
Stout, C S, Trustee	422	106	4 24
" " "	476	2,000	80 00
" " "	477	953	38 12
Stout, Mrs M E	170	500	20 00
" "	188	500	20 00
Searles, W A, Trustee	317	500	20 00
Searles, W A	332	250	10 00
" Trustee	327	500	20 00
Waller, L P F, Trustee	368	100	4 00
" " "	367	3,000	120 00
" " "	458	100	4 00
" " "	459	100	4 00
" " "	460	100	4 00
Wetzel, Theo, Trustee	216	50	2 00
" " "	233	40	1 60
" " "	237	40	1 60
" " "	360	1,000	40 00

And in accordance with law, and an order of the Board of Directors, made on the 13th day of August, 1889, so many shares of each parcel of such Stock as may be necessary, will be sold at public auction, at the office of the Company, 303 California Street, room 11, San Francisco, California, on TUESDAY, THE EIGHTH DAY OF OCTOBER, 1889, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

J. M. BUFFINGTON, Secretary.

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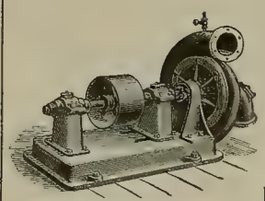
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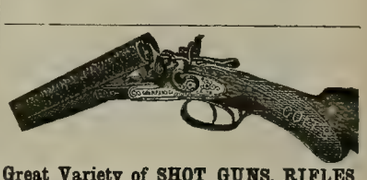
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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

From the official report of U. S. Patents in Dewey & Co.'s Patent Office Library, 220 Market St., S. F.

FOR WEEK ENDING SEPT. 17, 1889.

411,183.—DREDGING APPARATUS—A. B. Bowers, S. F.

411,223.—BOILER—I. Hulme, Yaquina, Ogn.

411,199.—VEHICLE—F. A. Huntington, S. F.

411,198.—TELEGRAPH KEY—A. E. Johnson, Carson, Nev.

411,164.—NOSE-PAD FOR EYE-GLASSES—J. P. Molitor, Vallejo, Cal.

411,173.—PENCIL-SHARPENER AND PAPER WEIGHT—A. Thurber, S. F.

The following brief list by telegraph, for Sept. 25th, will appear more complete on receipt of mail advices:

California—Henry M. Wrede, San Francisco, cable-gripper; Benjamin Walton, Cramton, fowl or stock-feeder; Alpheus E. Rowe, assignor to H. L. Tatum and J. J. Bowen, San Francisco, crushing-mill; John Richards, San Francisco, pumping machine; David H. Lunn, Ferndale, wire-stretcher; Reuben W. Hent, San Francisco, roller-bearing; Alexander Grant, assignor of half to M. N. Miller, Los Angeles, steam boiler; George B. Fraley, San Francisco, electric railway; John Ducker, Santa Rosa, book-rest and easel; Jabez Draper, Stockton, punch; Charles D. Bobo, Nevada City, obstetrical instrument.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

TELEGRAPH KEY.—Alfred E. Johnson, Carson City, Nev., assignor of one-half to Moses M. Cohn. No. 411,198. Dated Sept. 17, 1889. This invention consists of a pivotally mounted swinging key-lever, a movable contact-finger connected with said key-lever, a series of contacts formed to represent telegraphic characters, over which the contact-finger is moved by the key-lever, and certain details of construction and arrangement. The object is to provide a telegraph key for the use of beginners to give them familiarity with the form and sound of the telegraphic characters, and also for the use of any person who is unable to send messages with the ordinary keys.

COMBINED PENCIL SHARPENER AND PAPER WEIGHT.—Alfred Thurber, S. F. No. 411,173. Dated Sept. 17, 1889. This device consists of an exterior case of any suitable size and shape, open at the top and having slotted sides, and in connection therewith of a block fitted to close therein, and having a knob by which it may be handled for the purpose of a paper weight, and trunions sliding in the slotted sides of the case, so that it may be turned and reversed within the case to expose the pencil-sharpening mechanism, which consists of a knife and file fixed to a lever fulcrumed at one side of the block, so that the knife and file may be moved over a slot through which the point of the pencil projects and sharpen the pencil with a drawing cut. An even and symmetrical point is made to the pencil.

VEHICLE.—Frank A. Huntington, S. F. No. 411,196. Dated Sept. 17, 1889. This improvement consists of an engine and suitable intermediate gearing whereby the vehicle may be propelled. The invention is designed to apply a gasoline or other vapor engine to an ordinary carriage or road vehicle, with frictional mechanism for transmitting power, changing the speed of the forward movement of the vehicle and reversing the motion of the wheel at will. When the vehicle is in motion a blast of air is forced around the cylinder, which keeps the cylinder sufficiently cool for practical work.

ELEVATORS COMMON CARRIERS.—An important decision has been made by the Supreme Court in the case of Treadwell against Whittier, Fuller & Co. By a jury in the Superior Court Treadwell was awarded $9000 damages for injuries sustained by the fall of defendant's elevator on which he was riding. At the time of the accident, Dec. 12, 1878, Treadwell was in the employ of the firm. In deciding the case, the opinion of the Court, which was written by Justice Thornton, says: "The defendants used their elevator in lifting persons vertically to the hight of 40 feet. That they were carriers of passengers and should be treated as such we have no doubt. The same responsibilities as to care and diligence rested on them as on carriers of passengers by stage-coach or railway." Continuing on the same subject the decision says: "Nor are the defendants excused by the fact that the elevator in use was constructed by a competent and skilled manufacturer from whom they purchased it. The manufacturer was their agent or servant in the construction of the elevator, and they are responsible for any want of care of the maker or builder."

THE Caledonia Gold Mining Company of Dakota will pay, September 26th, dividend No. 15 of eight cents a share, aggregating $8000, making $72,000 paid this year.

Mining Personals.

D. P. Pierce is superintendent of the Hathaway mine, Ophir, Placer county.

W. M. Lent, largely interested in the Bodie mines, is registered at the Palace hotel.

Robert R Grayson, secretary of the Bullion and Grand Prize companies, has returned from Idaho.

Thos. H. Dougherty is the superintendent of the Golden Messenger M. Co., Meagher Co., M. T.

F. F. Coffen, superintendent of the Nevada Queen and other Tuscarora mines, has returned to Tuscarora.

John Kelly, superintendent of several of the Bodie mines, left last week for a few weeks' visit to the East.

H. W. Sparks is superintendent of the Red Lion Mine, Cable district, M. T. The mill has been enlarged to ten stamps and is working satisfactorily.

F. S. Sutherland is superintendent of the mines of the International Company of Mexico, now operating in the mines of Alamo, Lower California, the scene of the recent gold excitement.

A Breece and family have located in San Francisco. The Breece & Wheeler mine, Placer county, is left in charge of W. Grinnell, as both of the owners are now residing in San Francisco.

Captain B. F. Dahl of San Francisco, who holds a controlling interest in the North Gould and Curry and East Best and Belcher, is visiting the Comstock. Work was resumed in both mines some time ago.

James A. Zabriskee, a mining engineer, interested in Mexican mining affairs, is in the city. He speaks very hopefully of the outlook for American investments in Mexico, both in railroad and mining matters.

Mr. Pearson, superintendent of the Gopher-Boulder mine at Kelsey, El Dorado county, has returned from Europe, and it is stated that the electric plant for the working of these mines will at once be put in.

Superintendent R. K. Colcord of the Esmeralda Con. Mining Co., is losing no time in getting to work on the mines of that company at Aurora, Nev. After the machinery is put on the Humboldt, Mr. Colcord will increase the working force to about 50 men.

Francis N. Byrne, who went East some months ago in the interest of the Gold Bank Tunnel Company, which was an enterprise to run a tunnel from the South Yuba river to the Nevada and Grass Valley districts, for the purpose of developing quartz veins, has returned to Nevada City.

Dr. H. H. Hutchings, who represents an Eastern company, is engaged in developing antimony mines near Black Knob, below Sacramento canyon, in the Humboldt range, Nev. He has seven or eight men employed, and expects to increase the force shortly to 17 men. He has two or three hundred tons of ore on the dump. He intends to reduce the ore on the ground, and for that purpose is erecting a smelting furnace, by which the pure metal will be turned out by one operation.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, term of subscription, and give it their own patronage, and as far as practicable aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

GOLD has been discovered near the city of Tacoma, W. T., and a number of claims have been located.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or who does not intend to pay for it*, let him not fail to write us *direct* to stop it. A postal card costing one cent only will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party neglected to stop it, we shall positively demand payment for the time it is sent.

For special reasons we here give prominence to the above notice. It has appeared in the above form in nearly all, if not every, issue of our journal for over one year past. Yet we are *occasionally* finding subscribers who say they have never seen the notice. Although they have received our paper constantly, or are knowing to its being mailed regularly to their address, they refuse to pay for it. Their excuses are various, viz.: "Never subscribed for it;" "subscribed only for the year paid for;" "told some agent to stop it;" "told the postmaster to stop it," etc. Through 24 years of careful and successful business, the proprietors of this journal have *never, knowingly or willfully, sent a newspaper to any person they knew at the time did not wish it, and we never will*, unless such person *unwarrantably* refuses to pay arrearages when able to do so.

No doubt we have been too obliging in retaining names once entered on our list of those whom we supposed desired to continue after the date paid for had passed. This, however, is owing to several reasons. Our paper is devoted to a cause that should entitle it, as long as devoted and true, to the friendship, goodwill and protection, if not the substantial support, of the individuals and classes whose welfare it sincerely strives to promote. The relations are such as should inspire mutual confidence and trust between publishers and subscribers.

While some are displeased to have a single copy of this paper sent beyond the time paid for, others are more lastingly offended at what they consider a breach of confidence, if the paper is stopped without their special order.

We shall be more careful than ever of sending this paper on credit in the future. Shall endeavor to employ none but *honest* and *careful* agents. Yet, if mistakes or discrepancies do occur, of any kind, we ask the favor of every subscriber to notify us promptly by LETTER (carefully stamped) or POSTAL CARD, with the full assurance herewith that we will not, knowingly, send the paper to any one who does not want it.

Those who report having written the publishers to stop their paper, before becoming angry about its not stopping, should remember it is far more likely that their letter never reached the publishers than that they would attempt to do business on so unsafe a plan as to continue to trust a subscriber whom they knew had written to stop it. In this connection we repeat the following points about stopping papers, some of which we know have been missed by very good and well-meaning and tolerably careful subscribers.

About Stopping this Paper.

In sending word to the publishers, you should be particular to note all of the following points: 1st, to send it to the P. O. by a trusty hand; 2d, to be sure you have a stamp on it; 3d, that it is correctly addressed; 4th, that your name is plainly written; 5th, that you give the name of your P. O.; 6th, that you give the name of the paper (or we should have to look over the long lists of subscribers on several newspapers). If your letter reaches us with the above 5th and 6th points overlooked, we should have to look over thousands of addresses to find your name to discontinue your paper. By missing one or more of the points above numerated on the part of subscribers, we are doubtless not blamed for not stopping papers when it is impossible for us to do so—and in many cases receive no intimation even about the matter.

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SHORT STROKE.

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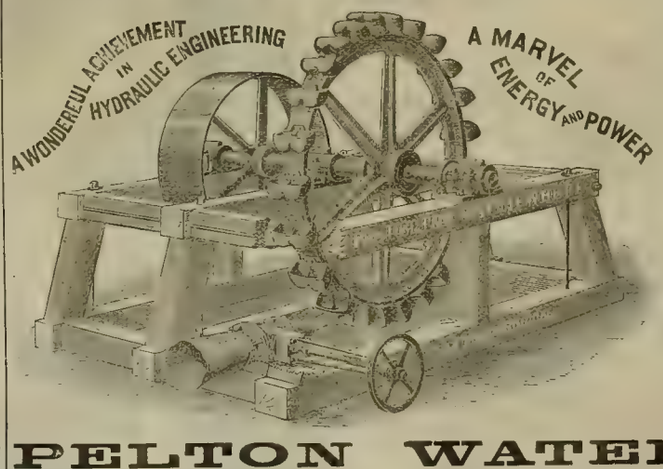
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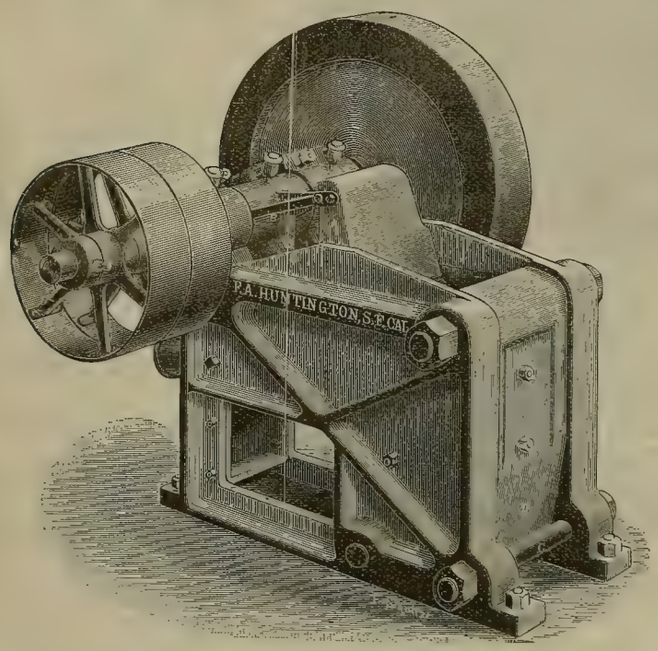
Varying from the fraction of 1 up to 15 and 20-horse power. Unequaled for all light-running machinery. Warranted to develop a given amount of power with one-half the water required by any other. ☞ SEND FOR MOTOR CIRCULAR. ADDRESS AS ABOVE. ☜

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MANUFACTURER AND DEALER IN

STEAM ENGINES AND MINING MACHINERY OF EVERY DESCRIPTION.

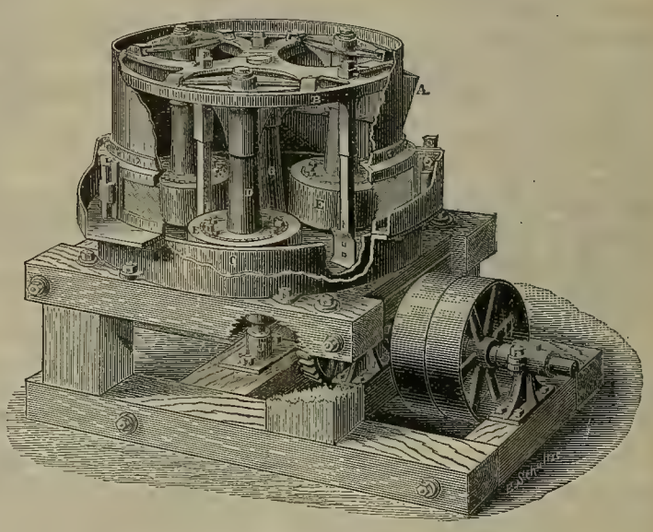
PRINCIPAL OFFICE, 213 FIRST STREET, SAN FRANCISCO.



Huntington's Improved Rock-Breaker.

The main features of this machine are strength, ease of adjustment and simplicity of construction.

The movable jaw *A* is worked by the eccentric *B* and is pivoted at the bottom. The stationary jaw *D* is secured at the top by a bolt running through it, and at the bottom bears against the heavy bolt *C*. The main wear is, of course, at the bottom of a breaker of this form, and the wear is easily taken up by inserting a plate between the bolt *C* and the jaw *D*. The jaw is thus swung in at the bottom, and the opening where the ore passes through is made correspondingly smaller. As will be seen by the cut, this machine is of very simple construction and is strong and durable.



F. A. HUNTINGTON'S
Centrifugal Roller Quartz Mill.

The following will explain the above cut:

The ore and water being fed into the mill at the hopper *A*, the rotating rollers and scrapers throw the ore against the ring die, where it is crushed to any desired fineness by the centrifugal force of the rollers as they roll over it.

The water and pulverized ore are thrown against and through the screens when fine enough. The discharge is so perfect that it makes little or no slimes, and leaves the pulp in good condition for concentration. The rollers are suspended, leaving a space of one inch between them and the bottom of the mill, thus allowing them to pass freely over the quicksilver and amalgam without grinding it or throwing it from the mill, while it agitates it sufficiently to make amalgamation perfect. For wet crushing and gold saving it has no equal.

I claim especial merit in that feature of this system *which prevents* ALL FLOURING of gold and quicksilver, and the consequent loss of gold that attends stamp milling.

For the economical working of ore that contains sulphurets, I particularly claim the adaption of this mill. The rotary method of crushing the ore so granulates the pulp (which is discharged the moment it is crushed) that a complete concentration of sulphurets is rendered most easy.



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ALL SIZES,

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ARTESIAN WELL PIPE,

ALL SIZES.

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PARKE & LACY CO., Agents, San Francisco, Cal.



New Catalogue for 1889 now ready.



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Adamantine Shoes, Dies and CRUSHER PLATES,

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Chrome Cast Steel for Rock Drills, Etc.



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MINE and MILL SUPPLIES.

ADAMANTINE SHOES AND DIES.—Guaranteed to prove better and cheaper than any others. Orders solicited, subject to above conditions.

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Smelter For Sale or Exchange.

One 50-ton wrought iron, water-jacket Smelting Furnace (36"x00" at the tuyeres) of the latest design, with Crusher, Blower, Boiler, Pumps, Engines, Tools, and everything complete for immediate delivery, and only used about six months. Cheap for cash, or will exchange for interest in a Lead-Silver Mine, or erect in any mining camp that will guarantee a certain output. For further particulars address Box 28, Elkhorn, Montana.

WANTED!

A partner with capital to run in a tunnel and develop a large and valuable sulphuret claim one of the best locations in the State. Full particulars given. Address, "C. H. C.," Box 2517, San Francisco, Cal.

AMALCAMATING MACHINERY.

Stamp Mills for Wet or Dry Crushing. Huntington Centrifugal Quartz Mill. Drying Cylinders. Amalgamating Pans, Settlers, Agitators and Concentrators. Retorts, Bullion and Ingot Moulds, Conveyors, Elevators, Brucknera and Howell's Improved White's Roasting Furnaces, Etc.

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Blake, Dodge and Comet Crushers, Cornish Crushing and Finishing Rolls, Hartz Plunger and Collom Jigs. Frue Vanner & Embrey Concentrators, Evans', Calumet, Collom's and Rittenger's Slime Tables. Trommels, Wire Cloth and Punched Plates. Ore Sample Grinders and Heberle Mills.

IMPROVED CORLISS AND SLIDE VALVE STEAM ENGINES. ❖ BOILERS HORIZONTAL, VERTICAL ... AND SECTIONAL. ....

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Hoisting Engines, Safety Cages, Safety Hooks,

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Air Compressors, Rock Drills, Etc.

GENERAL MILL AND MINING SUPPLIES, ETC.

Sectional Machinery FOR MULE-BACK TRANSPORTATION.



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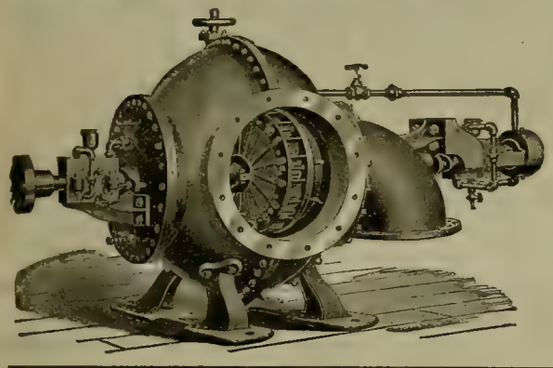
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JAMES LEFFEL'S Mining Turbine Water Wheel.

These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

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CALIFORNIA WINE COOPERAGE CO.

FULDA BROS., Proprietors,
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ALL KINDS OF CASKS, TANKS, Etc.
SHIP, MINING, and WATER TANKS a Specialty.

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HENRY J. ROGERS & CO.
Successors to CHAS. CALLAHAN
IMPORTERS AND DEALERS IN
CAST and WROUGHT IRON SCRAP
SECOND-HAND BOILERS AND OLD MACHINERY
Of every description.
The Highest Price paid for all kinds of Metals.
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WATER POWER TRANSMITTED BY ELECTRICITY

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COIN RETURNS ON ALL BULLION DEPOSITS IN 24 HOURS.
WORKING TESTS OF ORES BY ALL PROCESSES.
SPECIAL ATTENTION PAID TO CONCENTRATION OF ORES.

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SELBY SMELTING and LEAD CO.,
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GOLD AND SILVER REFINERY And Assay Office.

Highest Prices Paid for Gold, Silver and Lead Ores and Sulphurets.

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LEAD PIPE,
SHEET LEAD,
SHOT, Etc., Etc.

ALSO MANUFACTURERS OF

Standard Shot-Gun Cartridges,
Under Chamberlin Patent.

JOHN TAYLOR & CO.,

IMPORTERS AND DEALERS IN

ASSAYERS' MATERIALS, MINE AND MILL SUPPLIES,

ALSO CHEMICALS, AND PHYSICAL, SCHOOL AND CHEMICAL APPARATUS.

63 & 65 First St., cor. Mission, San Francisco.

We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price. Our New Illustrated Catalogue, with prices, will be sent on application.

Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England. Also for E. G. DENNISTON'S Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices.

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Nevada Metallurgical Works.

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Ores Sampled and Assayed, and Tests made by my Process.
Assaying and Analysis of Ores, Minerals and Waters.
Mines Examined and Reported on.
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BATTERY SCREENS.

Best and Cheapest in America.

No imitation, no deception, no planished or rotten iron used. Only genuine Russia iron in Quartz Screens. Planished iron screens at nearly half my former rates.

I have a large supply of Battery Screens on hand suitable for the Huntington and all Stamp Mills, which I will sell at 20 per cent discount.



PERFORATED SHEET METAL

For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass. Zinc and other metals punched for all uses.

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Sept. 26, 1889.

General trade the past week was only fair. Prices in nearly all lines of goods are stronger. In the local market money is reported to be working closer, yet all legitimate wants are readily met at bank. Remittances from the interior are coming in more freely, which, with an advancing market for wheat, is causing more confidence in the future.

MEXICAN DOLLARS—The market continues fairly steady at 74¼@74½c. The demand is only moderate. The steamer hence Sept. 21st for China took out for Hongkong $60,147; Shanghai, $70,000. Total, $130,147.

SILVER—The steamer hence Sept. 21st for China took out for Japan $100,000; Hiogo, $52,000. Total bullion, $152,000. For shipments by the above steamer 93½c was paid. Our quotations are for Selby's Gold and Silver Refinery bars, and if other refined silver does not fetch the quotations there must be some fault in the refining. The market since the steamer left has been quiet but gaining in strength, with 93¾c freely bid to-day, with no sellers at the price. London cables and New York telegrams give a strong market. The statement by the Treasury that only $8,000,000 in silver dollars remains in the Treasury, against which silver certificates have not been issued, has a decided strong bull bearing on the metal, for it goes to show that we can care for about all the silver mined. The address of a leading banker at the Bankers' Convention favoring the retiring of legal tender notes and issuing silver certificates, and also free coinage of silver, is also in favor of the metal, for it goes to show that the sentiment in this country is growing in favor of bimetallism. The output of silver bullion on this coast is still light.

QUICKSILVER—Receipts the past week aggregate 382 flasks, and exports 10 flasks to Auckland. The market is quiet but firm.

LIME—Receipts the past week aggregate 6110 barrels, being the heaviest for any single week this year. The consumptive demand is still heavy. Prices are unchanged.

BORAX—Receipts the past week, 221 ctls., and exports 21,589 lbs. to Boston and 42,756 lbs. to New York, both via Victorta, B. C. The market is steady, with an active Eastern demand.

LUMBER—Prices have advanced the past week $1. The advance is due to a better combination of millmen.

TIN—Exports by sea the past week were 32,240 plate to Victoria, B. C. The market is very stiff for both spot and shipment. The European market continues quite active, with more or less daily fluctuations reported. The consumption with us is, as usual at this time of the year, light.

ANTIMONY—The market is strong at another advance. Quotations are about double those ruling one year ago.

LEAD—The market is fairly steady, with the usual consumption reported. The output of the mines in this couutry will show an increase this year over that of 1888.

COPPER—The market is still in an unsettled condition. After advancing Lake at the East to 11c and keeping it steady for a few days, the price fell off again; closing weak. In another department of the paper there is an editorial on the present situation.

IRON—The market continues to hold strong, with still higher prices not at all unlikely. Consumers do not look for lower prices, consequently they take hold more freely. The stock here is growing beautifully less, while the quantity on the way is small.

COAL—Imports the past week are as folows: Coos Bay, 750 tons; Nanaimo, 2324; Australia, 5125; Departure bay, 7100; Seattle, 6541. Total, 21,841 tons. The past week an advance of $1 a ton was made on Gilman and Seattle, and 50c on Coos bay. The market for all kinds is very strong, with dealers and consumers buying quite freely. The low prices are causing many to stock up for winter freer than they usually do. The high rates of freight by both coasters and deep-sea vessels are against lower prices for some time to come. With much of an advance in coast, coast collieries will increase their output.

Eastern Metal Markets.

By Telegraph.

NEW YORK, Sept. 26, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	42½	92¾	$11 00	$3 97½	$21 60
Friday	42½	92¾	11 00	4 00	21 30
Saturday	42½	92¾	11 00	3 95	21 30
Monday	42 9 16	92¾	11 00	3 92½	21 40
Tuesday	42 9-16	92¾	11 00	3 90	21 40
Wednesday	42 9-16	93⅛	10 60	3 92½	21 00

NEW YORK, Sept. 26.—A large quantity of copper is selling, including some from export prices. Lake, $11; Arizona, Montana and other Western, $10.50; Baltimore, $12. The market closed weaker. Pig lead is dull, $3.95 being asked and $3.90 bid. Borax is scarce and higher. Quicksilver is firm at 70@71 cts, under a moderate business.

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	$ 7½ @ 7½	Cardiff	9 50@10 00
Liverpool St'm	7 50 @ 7 75	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	9 00 @ 9 00	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Gilman	7 00
Scotch Splint	9 00	Seattle	7 00
Greta	8 00	Coos Bay	5 50
Westminster Brymbo	9 00	Cannel	10 00
Nanaimo	9 00	Egg, hard	17 50
Sydney	8 00	Cumberland, in sacks	19 00
Jackson	6 00	do, bulk	18 00

San Francisco Metal Market.

WHOLESALE.

THURSDAY, September 26, 1889.

ANTIMONY	19 @ 20
BORAX—Refined, in carload lots	7½@ 7¾
Powdered " " "	7½@ —
Concentrated " " "	— @ 6¾
All grades jobbing at an advance.	
COPPER—	
Bolt	21 @ 22
Sheathing	22 @ 24
Ingot, jobbing	15 @ 16
do, wholesale	13@ 14
Fire Box Sheets	22 @ 24
LEAD—Pig	4 ½@ —
Bar	5 @ —
Sheet	7 @ —
Pipe	6 @ —
Shot, discount 10% on 500 bags Drop, ₱ bag	1 45 @ —
Buck, ₱ bag	1 65 @ —
Chilled, do	1 85 @ —
STEEL—English, lb	16 @ 20
Canton tool	9 @ 9½
Black Diamond tool	9 @ 9½
Pick and Hammer	8 @ 10
Machinery	4 @ 5
Toe Calk	4½@ —
TINPLATE—B. V., steel grade, 14x20, P. S	4 80 @ —
B. V., steel grade, 14x20, spot	4 85 @ —
Charcoal, 14x20	6 25 @ 6 75
do roofing, 14x20	5 12½@ 5 25
Pig tin, spot, ₱ lb	21 @ 21½
do, do, prompt shipment	— @ —
COKE—Eng., ton, spot, in blk & sks, resptvly	17 00 @20 00
Do, do, to load	13 00 @13 25
QUICKSILVER—By the flask	— @47 50
Flasks, new	@ —
Flasks, old	3? @ —

	Spot.	To Load.
IRON—Glengarnock ton	29 00 @—	27½@ —
Eglinton, ton	29 00 @—	28½@ —
American Soft, No. 1, ton	— —@31 00	31½@ —
Oregon Pig, ton	— — @30 00	— @ —
Clay Lane White	— — @26 00	25 @ —
Shotts, No. 1	28 50 @29 00	— @ —
Bar Iron (base price) ₱ lb	2½@ 3	— @ —
Chrome iron ore, ₱ ton	— —@10 00	— @ —

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$20 00	$17 00
41 to 50 ft	21 00	18 00
51 to 60 ft	23 00	20 00
61 to 70 ft	27 00	21 00
1x3, fencing	22 00	19 00
1x4, "	21 00	18 00
1x3, 1x4 and 1x6, odd lengths	19 00	16 00
Second quality	17 00	15 00
Selected	24 00	22 00
Clear, except for flooring	31 00	28 00
Clear for flooring	2 00	.....
Clear V. G. No. 1 flooring	6 00	.....
Firewood	14 00	10 00
Dressed Pine, flooring, No. 1, 1x6	32 00	29 00
No. 1, 1x4	34 00	30 00
No. 1, 1¼x4, 1¼x6, and odd sizes	37 00	33 00
All sizes, No. 2	27 00	24 00
Stepping, No. 1	44 00	36 00
Stepping, No. 2	34 00	25 00
Ship timber and plank, rough	27 00	18 00
Selected, planed 1 side, average 40 ft	29 00	24 00
" " 2 " " "	31 00	26 00
" " 3 " " "	33 00	28 00
" " 4 " " "	35 00	30 00
Deck plank, rough, average 35 ft	35 00	32 00
Dressed, average 35 feet	40 00	35 50
Pickets, rough, B. M	20 00	16 00
½x1½, 4 ft long, ₱ M	6 50	5 00

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, department 10, San Francisco:

PACIFIC TELEPHONE AND TELEGRAPH CO., Sept. 21. Object, the purchase and operation of all kinds of electro-magnetic telegraphic and telephonic rights, also patents, inventions and cables, and to do a general district and local telegraph and messenger business in this State and elsewhere. Capital stock, $5,000,000. Directors—Lloyd Tevis, John I. Sabin, E. S. Pillsbury, W. F. Goad and W. C. Gibbs.

KNAPP & LAWS CO., Sept. 23. Object, dealing in merchandise. Capital stock, $100,000 in 10,000 shares. Directors—E. G. and S. H. Knapp, W. B. Sharp, J. I. Jamison and R. J. Laws.

GOLDEN EAGLE M. CO., Sept. 25. Location, Nevada county. Capital stock, $2,500,000. Directors—Frederick H. Hawsman, Walter Speyer, Alexander Hay, James H. Munday and Frederick K. Shawhan.

STILES MILL AND CONCENTRATOR MANUFACTURING CO., Sept. 25. Object, to manufacture ore pulverizers and concentrators under the Wm. C. Stiles patents. Capital stock, $500,000. Directors—John H. Wise, Wm. C. Stiles, Walter K. Craig, E. W. Roberts and Abraham Halsey.

PACIFIC & OCEANIC TRADING CO., Sept. 25. Object, to deal in merchandise on the Pacific Coast and islands of the Pacific ocean. Capital stock, $50,000. Directors—H. H. Sherwood, R. L. Sherwood, T. H. Minor, C. E. Bowen and C. N. McConnell.

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Stonewall, Sept. 21, $8000; Occidental (Real del Castillo, Lower Cal.) $3,000; International Co., $2600; Con. Cal. and Virginia, 21, $45,238; Bluebird, 18, $17,744; Butte and Boston, $32,912; Hanauer, 20, $2400; Hanauer, 21, $2750; Proposso, (Mexico) 21, $60,000; Iago, (Mexico) $65,000; Candelaria, (Mexico) $50,000.

A CAVE has been struck in the Lincoln mine at San Pedro, New Mexico, the ore about which is so exceedingly rich as to have thoroughly excited all the miners in that region. The find is said to be the biggest ever made in the Southwest.

SANDS W. FORMAN, secretary of the State Board of Forestry, is expected home from Europe in October. He has been abroad several months investigating the forestry systems of France and Austria.

THE resumption of coinage at the Carson Mint did not affect the price in the least or create any great demand for silver bullion.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'NT. SALE.	SECRETARY.	PLACE OF BUSINESS
Best & Belcher M Co	Nevada	44.	25.	Sept 11.	Oct 16	Nov 6. L Osborn. 309 Montgomery St
Bulwer Con M Co	California	6.	25.	Aug 6.	Sept 12	Oct 10. L Osborn. 309 Montgomery St
Calaveras Blue Gravel M Co	Cal.	3.	3.	Aug 3.	Sept 16	Oct 2. B Burris. 240 Montgomery St
Central California Oil Co	California	1.	50.	Sept 6.	Nov 1	Nov 18. F L Gorlinski. 314 California St
Challenge Con M Co	Nevada	5.	50.	Aug 6.	Sept 9	Sept 30. C L McCoy. 329 Pine St
Chicago M & M Co	California	2.	15.	Sept 13	Oct 18	Nov 4. W Grant. 520 Montgomery St
Crown Point M Co	Nevada	52.	50.	Sept 18	Oct 21	Nov 11. J Newlands. 329 Pine St
Con New York M Co	Nevada	1.	25.	Aug 14	Sept 18	Oct 9. C E Elliott. 309 Montgomery St
Del Norte Gravel M Co	California	2.	7.	Aug 24	Oct 3	Oct 26. J B Cronan. 230 Montgomery St
East Sierra Nevada M Co	Nevada	1.	10.	Aug 3	Sept 13	Oct 7. G R Spinney. 310 Pine St
Gray Eagle M Co	California	14.	4.	Aug 13	Sept 16	Oct 8. O H Bogart. 347 Pine St
Golden Prize Con M Co	Nevada	3.	25.	Sept 21	Oct 26	Nov 16. C D Bennett. 330 Pine St
Keyes M Co	Nevada	4.	30.	Aug 27	Oct 1	Oct 21. J H Sayre. 328 Montgomery St
Livermore Coal M Co	California	1.	50.	Sept 18	Nov 6	G C H gins. 120 Sutter St
Mineral King M & M Co	Arizona	3.	10.	Aug 22	Sept 24	Oct 21. P H Leonard. 419 California St
Mono M Co	California	28.	50.	July 24	Aug 26	Oct 1. B L Burling. 309 Montgomery St
North Belle Isle M Co	Nevada	16.	20.	Sept 18	Oct 22	Nov 13. J W Pew. 310 Pine St
North Bonanza M Co	Nevada	9.	10.	Sept 17	Oct 26	Nov 14. J F Holling. 410 Montgomery St
Potosi M Co	Nevada	33.	50.	Sept 18	Oct 22	Nov 12. C E Elliott. 309 Montgomery St
Peer M Co	Arizona	8.	10.	Sept 4	Oct 10	Nov 5. A Waterman. 309 Montgomery St
Palesade S M Co	Nevada	1.	10.	Aug 6	Sept 16	Oct 2. D Buck. 309 Montgomery St
Platt & Gilson G M Co	California	3.	4 00.	Sept 11	Oct 15	Nov 4. C Herrmann. 326 Kearney St
Scorpion M Co	Nevada	1.	10.	Aug 8	Sept 13	Oct 7. G R Spinney. 316 Pine St
Scott Bar M & M Co	California	3.	10.	Sept 10	Oct 12	Oct 31. H Pink. 309 Montgomery St
Southern Cal Coal & Clay Co	Cal.	2.	10 30.	Aug 16	Sept 16	Oct 16. W G Mugan. 10 California St
True Con M Co	California	7.	2½.	Aug 31	Oct 12	Nov 16. J C Bates. 434 California St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Nevada Queen M Co	Nevada.	H Deas	309 Montgomery St	Annual	Oct 9
Presidio M Co	California.	L Osborn	309 Montgomery St	Annual	Oct 7

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Caledonia M C	Nevada.	A S Cheminant	328 Montgomery St	08	Aug 5
Con California & Va M Co	Nevada.	A W Havens.	309 Montgomery St	50	Sept 10
Derbec Blue Gravel M Co	California.	T Wetzel.	522 Montgomery St	70	Aug 25
Idaho M Co	California.		Grass Valley	7.50	Sept 5
Navajo M Co	California.	J W Pew	310 Pine St	10	Apr 1
Pacific Borax Salt & Soda Co	California.	A H Clough	230 Montgomery St	1 00	Sept 10

Mining Share Market.

Mining stocks the past week have been quiet, with outside of Alta and Justice only from 2½ to 5 per cent fluctuations in the Comstock. The light fluctuations have naturally brought out more pronounced expressions from the bears and bulls. The former are still looking for lower prices before there is much in the market. This opinion is based on the tight money market; business generally dull, the situation in the Comstock mines pointing to several weeks of deadwork before the character of the result can be known; and in the meantime assessments have to be levied and collected. The bulls are confident of better prices in the near future, based on the following: United States Senator Jones is watching with close personal attention the work going on in the Gold Hill mines, as is Hon. Francis Newlands, which looks well for that end of the lode. Col. Mackay is expected on the Comstock at an early day to give personal attention to the mines in which he is reported to be largely interested, and the work being done and to be inaugurated at an early day is of the most important kind. In running drifts and crosscuts, streaks of ore are liable to be cut at any time which will admit of sharp turns in the stocks. Outside stocks have not been very attractive and did not allow even the quickest chipper to make profitable turns, outside of a very short-lived small spurt in Bodie.

From the Comstock mines our advices report that the Ward shaft is repaired to the water (1850-foot) level, and a station cut out on the 1050-foot level, from which a drift running west was started on last Monday. The Alpha shaft is sunk 50 feet below the 500-foot level. Con. Imperial 300-foot level west crosscut is out over 40 feet in good quartz. The winze that is sunk to connect with the east shaft, by a drift from the bottom, is completed and drift started. Crosscutting on the 500-foot level will be commenced soon after the north drift reaches the Alpha. Yellow Jacket's west drift on the 500-foot level is out about 700 feet. Crosscutting east from bottom of winze on the 1200-foot level of Belcher. The 1465-foot Ophir, north lateral drift, is in nearly 500 feet north of the Union south line. It is claimed by mining-men that important stringers and streaks of ore will be cut in running this drift toward the Sierra Nevada south line. From Mexican and Ophir nothing new is at hand. Con. Virginia is shipping the usual quantity of ore from the 1400 to the 1950 foot level. It is claimed that soon after Col. Mackay arrives, he will probably have the water in this mine pumped out dowe to the 2100-foot level, where a station will be cut and a west crosscut started to intersect the lode now being worked on the 1950-foot level. From the outside mines our advices are growing in interest from both the Quijotoas and Tuscaroras. It now looks as if both these districts will bear more careful watching iu the near future.

The stock market opened this (Thursday) morning strong, higher and active for the Comstocks, and barely steady for outside stocks. Official letters received to-day from the Gold Hill mines are of an unimportant character outside of the information pointing to more active work soon. From Hale and Norcross the official letter reports more crosscuts started, and West crosscut No. 2 on 300-foot level in ore. Official letters from the Bodies report that in Mono below the 1000-foot level they are stoping out ore. From Bodie the letter gives no particular information.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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R. G. BAILEY—San Francisco.
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M. D. SHRADER—Santa Clara and Santa Cruz Cos.
GEO. WILSON—Sacramento Co.
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FRANK S. CHAPIN—Lassen Co.
JULES BAUMANN—Arizona.
H. G. PARSONS—Nevada.
WM. H. HILLBARY—Oregon.
F. C. ROBERTSON—Oregon and Washington.
W. B. FROST—Montana and Idaho.
JUAN C. JENS—New York City.

CHARLES B. HILL has resigned from his position as Secretary of the Lick Observatory and gone into the insurance business in this city.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept. 4		WEEK ENDING Sept. 11.		WEEK ENDING Sept. 18.		WEEK ENDING Sept. 25.	
Alpha	1.35	1.60	1.25	1.45	1.30	1.50	1.30	1.35
Alta	1.40	1.65	1.50	2.00	1.90	2.00	1 90	2.40
Andes	.70	.80	.70	.70	.70	.75	.70	....
Argenta	....	....	....	....	....	....	....	....
Belcher	3.90	3.40	2.80	3.00	2.80	3.10	2.50	2.70
Best & Belcher	3.80	4.40	3 40	3 75	3.55	3.65	3.15	3.45
Bullion	.65	.85	.60	.70	.60	.65	.60	.65
Baltimore	.25	.30	....	....	....	....	....	....
Belle Isle	....	....	....	....	.15	.15	.10	....
Bodie Con	.90	1.00	.90	1.00	.75	.85	.60	.85
Benton	....	....	....	....	....	....	....	....
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.10	.15	.30	.35	.30	.30	.30	....
Commonwealth	2.50	2.50	2 50	3.25	3 20	3.25	....	....
Con. Va. & Cal	7¼	8	7¼	7¾	6¾	7¾	6¾	6¾
Challenge	2.00	2.50	2.00	3.40	2.80	3.50	2.70	2 95
Chollar	2.15	2.55	2.00	2.20	1.85	2.30	1 90	2.00
Confidence	6¼	6¾	6¼	6¾	....	....	6.25	....
Con. Imperial	.50	.55	.45	.50	.45	.50	.40	.45
Caledonia	.25	.30	.30	.35	....	....	.25	.25
Con. Pacific	....	....	....	....	....	....	....	....
Crown Point	3.00	3.50	2.90	3.30	2.74	3.30	2.50	2 80
Crocker	.45	.60	.65	.60	.45	.60	.45	.54
Central	....	....	....	....	....	....	....	....
Dudley	....	....	....	....	....	....	....	....
Eureka Con	....	....	....	....	2.25	2.25	2.40	2.50
Exchequer	.65	.80	....	....	.65	.60	.70	.60
Grand Prize	....	....	.65	.80	.75	.80	.60	....
Gould & Curry	2.15	2 60	2.05	2.20	1.95	2.30	1.90	2.00
Hale & Norcross	3.20	3.80	3.10	3.20	3.00	3.45	3.65	3.20
Holmes	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Iowa	....	....	....	....	....	....	.15	....
Julia	....	....	....	....	....	....	.25	....
Justice	1.60	2.00	1.60	1.85	1.70	1.85	1.55	1.90
Kentuck	1 25	1.50	1.20	1.25	1.10	1.25	1.10	1.35
Lady Wash	.35	.40	.40	.45	.40	.45	.40	....
Locomotive	....	....	....	....	....	....	....	....
Mono	.90	1.20	.95	1.00	.75	.80	.75	.80
Mexican	4.25	5 00	3.60	4.20	3.70	4.35	3.60	3 85
Mt. Diablo	....	....	....	....	....	....	....	....
Navajo	....	....	.35	.40	.35	.40	.30	....
North Belle Isle	.75	.80	.80	.90	.80	.90	.60	.75
Nev. Queen	.60	.70	.65	.85	.81	.85	.60	....
Occidental	1.80	1.90	1.55	1.75	1.70	1.75	1.40	1.50
Ophir	4.80	5¼	4.50	4 80	4.45	5¼	4.40	4.75
Overman	....	....	1.40	1.15	1.25	1.15	1.30	1 30
Potosi	1 60	1.90	1.50	1.55	1.40	1.70	1.25	1.40
Peerless	.35	.45	.40	.4	.35	.35	....	....
Peer	.20	.30	.15	.20	.10	.15	....	....
P. Sheridan	....	....	....	....	....	....	....	....
Silver Star	....	....	....	....	....	....	....	....
Savage	2 35	2.85	2 15	2.40	2.20	2.60	2.15	2.25
S. B. & M	1.80	1 05	1.65	1 80	1.80	1 95	1.55	1.75
Sierra Nevada	2.90	3.50	2.75	3.00	2.60	3.05	2.60	2 75
Silver Hill	.45	.55	.40	.45	.45	.45	40	....
Silver King	....	....	....	....	....	....	....	....
Scorpion	.15	.20	.15	.18	.20	.30	.30	....
St. Louis	....	....	....	....	.35	.35	....	....
Syndicate	....	....	....	....	....	....	....	....
Union Con	3.30	4.20	3.80	3.30	2.90	3.45	2 95	3.20
Utah	1.10	1.30	1.05	1.15	1.00	1.20	.95	1.05
Weldon	....	....	.25	.30	.20	....	....	....
Yellow Jacket	3.25	3.50	3.15	3.40	3.20	3.45	3.00	3.20
....	....	....	....	....	....	....	....	....
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Sales at San Francisco Stock Exchange.

THURSDAY, Sept. 26, 9:30 A. M.

300	Gould & Curry		2.05
200	Hale & Nor		3.30
380	Alta	2.15	
800	Mexican		4.00
150	Andes	75c	
50	Navajo		35c
50	Alpha	1.35	
150	Nev. Queen		60c
100	Belcher	2.10	
150	N. Belle Is		80c
450	Best & B	3.50	
320	Ophir		4.80
100	Bodie	75c	
300	Peerless		30c
100	Bullion	60c	
100	Potosi		1.35
50	Bulwer	30c	
190	Savage		2.30
150	Challenge	2.75	
250	S. B. & M		1.85
100	Commonwealth	3.10	
350	Sierra Nevada		2.80
200	Crown Point	2.85	
550	Union		3.45
200	Con Va & Cal	6¾	
200	W Comstock		35c
300	Grand Prize	50c	
200	Yellow Jacket		3.30

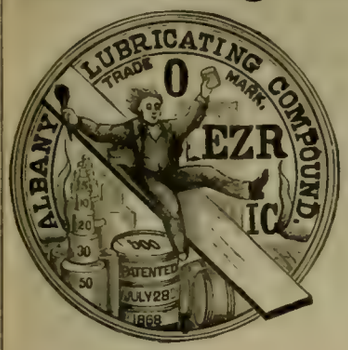
Successful Patent Solicitors.

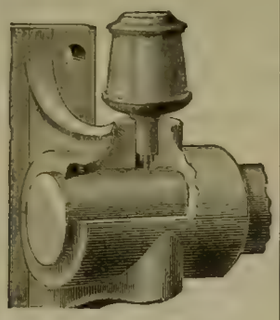
As Dewey & Co. have been in the patent soliciting business on this Coast now for so many years, the firm's name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific Coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this Coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That this is understood and appreciated, is evidenced by the number of patents issued through their SCIENTIFIC PRESS Patent Agency (S. P.) from week to week and year to year.

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AN immense deposit of graphite has been located in the Carlton Pass of the Cowlitz river, Lewis county, Washington Territory. The ledge is eight feet thick.

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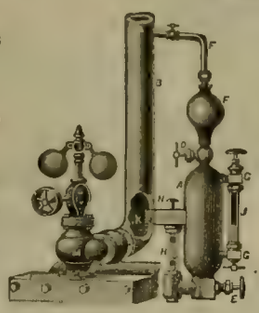




1868.
Manufacture commenced at Albany, New York.

1876.
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1889.
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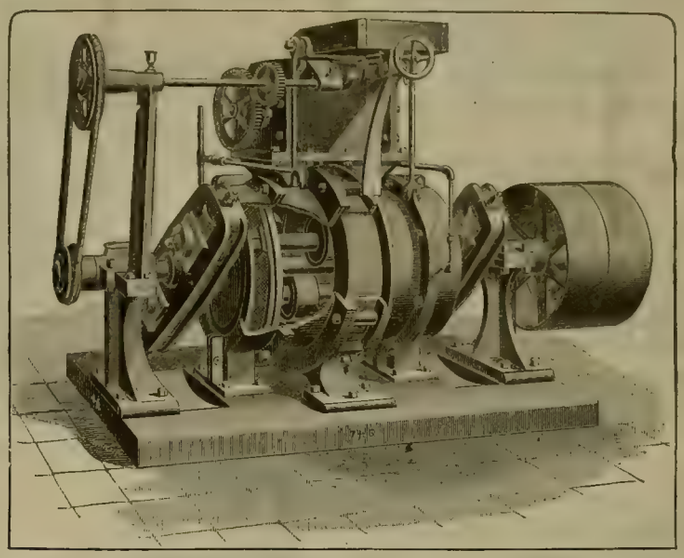
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Smith & Drew took out Tuesday, in their dry wash diggings, in addition to 5 ozs. of fine gold, a nugget weighing 22 ozs. The machine used was Freeman's Dry Process Separator.—*Utah Daily Union, May 10, 1889.*

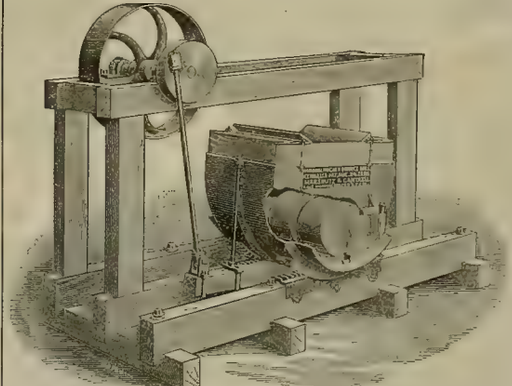
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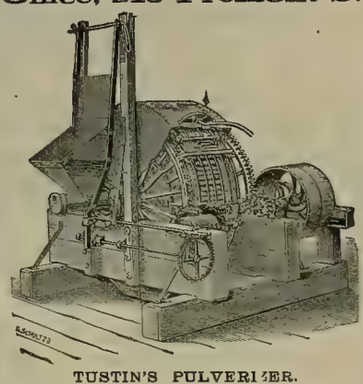
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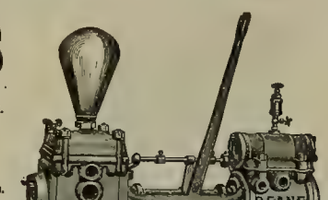


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A few copies of this work, the only one ever published treating of Pacific Coast Coal Mining, have been obtained, and are for sale at this office for $2.50 per copy. It was written by W. A. Goodyear, Mining and Civil Engineer, formerly of the California State Geological Survey.

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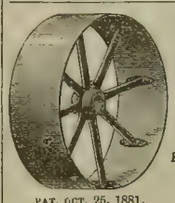
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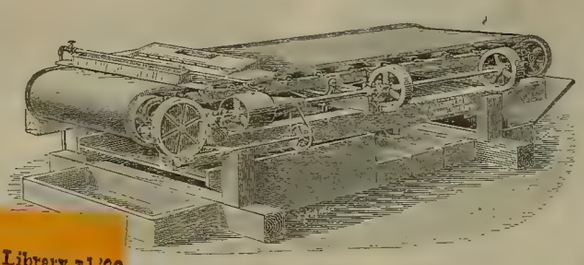
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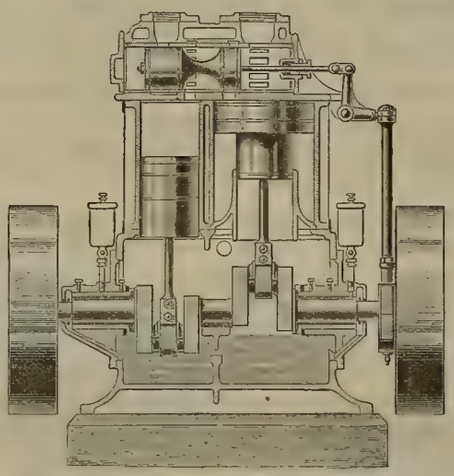
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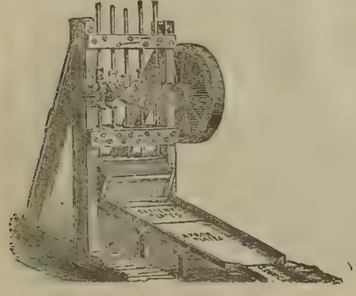
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VOL. LIX Number 18.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, OCTOBER 5, 1889.

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Beach Sand Mining.

We give herewith two photo-facsimiles of scenes on the beach at the Gold Bluff black-sand mines, Humboldt county. The deposits in this region created much excitement some 36 years ago. They extend from Oregon creek eight miles in a southerly direction. The whole line of the beach was worked for the gold the sand contained. This deposit of black sand contains traces of platinum, osmium-iridium too minute to have any commercial value, but with sufficient gold to make the business of gathering it lucrative. From the date of discovery to the present writing these beaches have been annually worked, success depending, more or less, on the occurrence of fierce gales of wind in the winter-time, and the consequently heavy surf that breaks along the shore. These black sands, as they are called, come from the disintegration of the bluffs facing the ocean, and which rise nearly vertical to a hight of from 100 to 800 feet above sea level. The bluffs are a formation of auriferous gravels deposited by the Klamath and its tributaries, the main river emptying into the sea centuries ago at this point. The bank caves, and the retreating waves carry the lighter detritus seaward, while the metallic portion remains on the beach in thin sheets, which the miner gathers and washes. This gold is from 900 to 950 fine, and sells for $19.50 per ounce.

One of the engravings shows a place on the beach known as the Widow's cave, and the other shows a party engaged in packing the auriferous sand. The sand is gathered and placed in sacks on the backs of mules, and is then carried to where water is available for washing. Only the concentrated or black sand is gathered. In one of the articles recently contributed to the PRESS by Jas. H. Crossman, these beach mines are fully described. We are indebted to that gentleman for the photographs from which these views were made.



HYDRAULIC MINING IN SISKIYOU COUNTY, CALIFORNIA.

Hydraulic Mining.

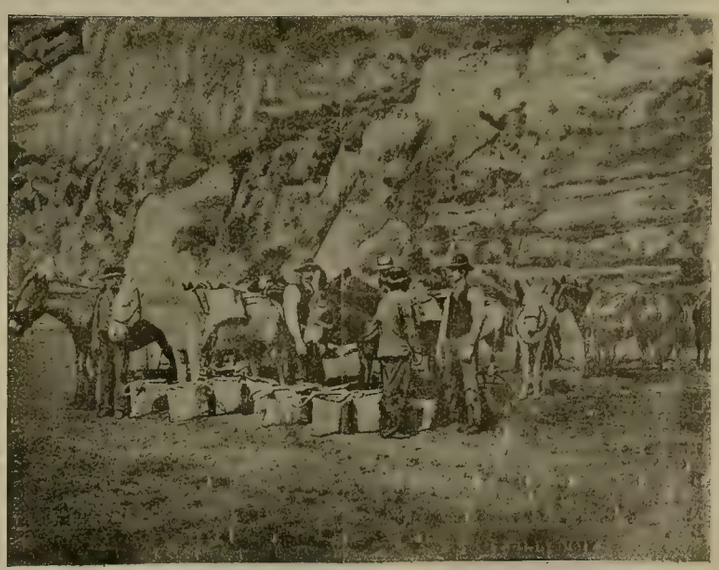
Notwithstanding that the hydraulic mines which were on tributaries draining into the Sacramento and San Joaquin rivers have been prevented by injunction from carrying on work by that process, there are still numbers of these mines being worked in the more northern portion of this State. We give on this page a typical scene in Siskiyou county. The cut was made direct from a photograph without redrawing. It shows the giant throwing its heavy stream against the bank, a mass of falling water from above, and the character of the bank itself.

These gravel banks are all of the same general formation, but vary more or less in hight, and in the amount of gold in the gravel. Great masses are undermined by the water and then broken up and washed. Powder is used to shatter and loosen the gravel while "in place," making less work for the water to do. In the series of articles on the "Northern Counties of California," recently published in the PRESS, the gravel-mining regions of Siskiyou county were fully described.

THE four miners who left Virginia City last June for Corea, under contract to the Corean Government, are now going about Seoul, which is two months inland, without money or employment. The Coreans will not divulge the situation of the rich mines, for one of which a stamp-mill has been sent out, and the Government evidently does not remember its contract.



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El Dorado County.

The Mining and Other Interests.

EDITORS PRESS:—The county is bounded on the north by Placer, on the east by the State of Nevada, on the south by Amador, and on the west by Sacramento county. It contains within its limits 1800 square miles, or 1,152,000 acres, making the county nearly 70 miles in length by 35 in width. The eastern part of the county is mountainous and is devoted principally to grazing and mining, though here and there, in favored spots, many profitable ranches and comfortable homes are to be found. Throughout the entire belt fruit culture comes to the front, while in the lower portion of the county adjoining Sacramento county the ranches produce hay and grain, besides raising a large amount of stock. This valley section possesses all the advantages of its sister, Sacramento county, in its adaptability to the raising of the fruits of the citrus family. At the present time the most prosperous and densely populated portion of the county is in the neighborhood of the county seat—Placerville—while there are a number of fine fruit-ranches from Shingle Springs to Diamond. It is the section from Diamond Springs up and across to Placerville, then out over the hills east and on to Coloma, that shows how well this belt is adapted to the production of fruits and grapes. The fruits of Coloma and the high-colored grapes of that section are eagerly sought after and command at all times the highest market prices. All orchard products vie with each other in their size, color, flavor and keeping qualities.

The Original Gold Discovery.

El Dorado claims the distinction of being both the pioneer and empire county in the discovery and production of gold. On the 19th day of January, 1848, J. W. Marshall picked up in the tail race of Sutter's sawmill the first gold found in California. While the chispa weighed but six pennyweights and 11 grains, it held in its evidence of the royal metal the promise of greater wealth than any similar weight of matter in the world's history.

Marshall's discovery was purely accidental, and it remained for Isaac Humphrey, an old Georgian gold miner, to fully show the value of the discovery and to introduce the proper means of collecting the metal by starting placer mining. Messrs. Sutter and Marshall's system of "tithing" or demanding one-third of all the gold extracted from the placers on their ground, proved irksome and the miners soon moved down to Mormon Island, where rich diggings were discovered. This led to prospecting throughout the entire State, the finds on the Calaveras, Mokelumne, Stanislaus, Yuba, Feather, Trinity, Klamath and Scott rivers following in rapid succession.

In 1850 the county was organized, with Coloma as county seat. Placerville soon grew ahead, and in 1856 the seat of the county was moved to Placerville to remain. Placerville was then an incorporated city. The county extends from the plains of the Sacramento on the west over a dividing range to the line of the State of Nevada on the east, a distance of 60 miles, and from the Middle Fork of the American river on the north to the South Fork of the Cosumnes river on the south, comprising an area of 1800 square miles.

Gold Output.

It is estimated that the placer mines of El Dorado county yielded fully $100,000,000. In the first workings of the placers the gold was extracted in the most primitive manner. Knives, bars, spoons and the fingers constituted the means. To these followed the batea and the rocker; then followed the "long tom," as introduced by Georgia miners. Following these came the sluice.

Famous Camps.

The old diggings on American river were Mormon Island, Condemned Bar, Long Bar, Doton's Bar and Whisky Bar.

On the Middle fork of the American river, from the junction upward, were Oregon Bar, Louisiana Bar, New York and Murderer's Bar, Wildcat, Willow, Hoosier, Green Mountain, Main and Poverty Bars; also Spanish, Fords, Volcano, Sandy, Grey Eagle, Yankee Slide, Eureka and Boston Bars, with Horseshoe and Junction Bars at the mouth of State ravine. On these bars of the Middle fork of the American, not less than 1500 men were engaged in mining in 1850, a claim being a piece of ground 15 feet in width extending across the river and back to the hills. One of the richest strikes was that at "Big Crevice" crossing the Middle fork of the American river at Murderer's Bar. At Hoosier Bar the hydraulic was brought into use and marked the greatest improvement in gravel mining.

The first mining company chartered in this State was the Boston Bar Co. of the American river in El Dorado county.

On the South fork of the American river were Dutch, Kanaka Red, Stony Ledge, Missouri and Michigan Bars; on the Cosumnes river, Big, Michigan, Buck's, Pittsburg and Wisconsin Bars.

Yield of the Bars.

Of the output of the various bars on the Middle fork of the American river, the following estimate gathered from most reliable sources will give a faint idea of the amount:

Volcano Bar	$1,500,000
Greenhorn Slide	1,000,000
Yankee Slide	1,000,000
Sandy Bar	500,000
Merken Cut Bar	200 000
Mud Canyon	2,000,000
Nigger's Bluff	500,000
Grey Eagle Bar	800,000
Eureka	100,000
Horseshoe Bend	2,500,000
Boston	100,000
American Bar	3,000,000
Willow Bar	600,000
Junction Bar	150,000
Missouri Canyon	800,000
Grizzly Canyon	300,000
Otter Creek	400,000
The Hills	300,000
Total	$16,750,000

Dry Diggings.

While the bars held the crowd by reason of their great wealth and the water supply, the dry gulches soon attracted attention. The first water ditch in the mining regions of California was that at Coloma, built in 1850 to 1851. This water found eager purchasers at $1 an inch for 12 hours. Drift mining or "coyoting" of the old river channels followed the working of the gulches, and soon led to the use of the hydraulic system, the invention of Mr. E. L. Mattison. On the Georgetown divide deposits were found from Pilot Hill to Greenwood, varying in depth from 25 to 300 feet. South of the South Fork of the American river is the great river channel commencing at White Rock circling thence through Smith's Flat to Coon Hollow. This channel and its spurs—Nigger, Clay and Indian Hills—proved exceedingly rich. At Coon Hollow alone, over $5,000,000 was extracted from the mines of that section. Oregon ravine proved rich, as did Spanish Hill and Tennessee Hill. Drift mining in Cedar Ravine also proved profitable. From the Lyon channel claim at Prospect Flat 15 acres of ground yielded $200,000. A rich channel crosses from Iowa canyon to the valley of Weber creek. There is also a deposit between the forks of Weber creek, while the south bank of the stream shows a continuous mass from above Newtown to Diamond Springs. South, Dry gulch, Park and Camp creeks, with all the branches of the Cosumnes, show auriferous deposits. Extensive mining fields were found at Dry Gulch, Henry's Diggings, Grizzly Flat, Brownsville, Fair Play and Indian Diggings.

Seam Mines.

These mines are peculiar. The rock is of porphyry with gold bearing quartz seams running through it in all directions. It is a question whether the breaking up of this porphyry belt was the source of the great deposits in the rivers, gulches and basins lying below, not only in El Dorado, but all along the line of the Mother lode from Mariposa north. This immense bed or vein of mineralized porphyry parallels the "Mother lode." In many respects it is similar to the Bonanza mine of Sonora. On the French mine at Greenwood a large amount of work has been done and about $250,000 extracted. Here the loose decomposed porphyry, to a depth of 30 feet, was washed off with a hydraulic and the free gold caught in the sluices. On the Shaw mine at El Dorado the porphyry ledge is 138 feet wide. The east side of the vein was worked in an early day to a depth of 75 feet and over $100,000 extracted. At present from one to four feet, next to the walls, is found to yield $20 a ton. The vein is here 1000 feet west of the Mother lode. Mr. George Hearst estimates that the entire zone will go $3 to the ton. Amador, Calaveras, Tuolumne and Mariposa counties have done no work on this belt.

Pockets.

In the neighborhood of Placerville are numerous pocket mines, while the same can be found in all the quartz veins of the county.

Copper.

The serpentine belt crosses the county, and, as in Calaveras and Amador, carries copper at Bunker Hill, Hastings Ravine, Pilot Hill, and at the Cosumnes copper mine.

Silver.

Silver was discovered on Spanish Flat, near Kelsey, the ore assaying $100 to $150 to the ton and $6 in gold.

Cinnabar

Is found in several parts of the county. An eight-foot ledge near the Amador line is said to carry 20 per cent metal.

Iron Ore

Is found in a number of places throughout the county, but it is not worked for the iron. East of Negro Hill is an extensive chrome-iron mine.

Asbestos

Is found on the Georgetown divide; granite, marble, limestone, sandstone, and slate are in large supply.

Slate.

The Chili Bar Slate Co. have a breast of 60 feet and face of 75 feet. When opened they will be able to quarry from a breast 1500 feet high. At present they are shipping a carload a week from their 40-acre mines. The slate brings $7 a square foot and is being used very extensively by the S. P. R. R. for their stations. This slate splits readily, has a smooth cleavage, and is remarkably tough in its texture.

The El Dorado Big Tunnel.

This tunnel is being driven to crosscut the mother-lode belt, 1200 feet deep. In driving this tunnel a belt of fine slate 50 feet wide was cut through, and is a bonanza in itself. The tunnel will show the formation across the belt, and as the company has eight locations on the belt, the enterprise cannot prove other than a most profitable investment for capitalists.

Quartz Mining.

The mother lode crosses El Dorado county, and here, as elsewhere along its line, the best mines are found on its belt. At El Dorado, the Greenstone, a contact vein between the serpentine and metamorphic slate, is under bond to a Placerville company, who are rigging to develop thoroughly. The old workings show a three-foot ledge to a depth of 265 feet. The ore of this mine is said to run up in the hundred of thousands in tellurides.

The Church mine dates back to 1852, when from a shaft 31 feet in depth quartz yielding $36,000 was extracted. The mine then lay idle until Mr. Church gained possession, when a shaft 400 feet deep was put down on the vein, which proved eight feet in width, though often going to 12 feet. A 10-stamp mill was erected and from the last 14 months' run of 6000 tons of quartz $100,000 was extracted. The mill was then shut down and the present three-compartment vertical shaft started. The present hoist will enable the owners to sink to a depth of 2000 feet. Over $85,000 has been expended in the last year on the plant. The lode lies 1000 feet east of the mother lode, with diorite hanging and talc footwalls. At this writing the Church mine is counted the best mining property in the county.

The Tullis mine is on the same vein as the Church, and lies three-fourths of a mile east of it. In the early workings of 1854, 100 tons of the croppings were milled and gave an average of $140 a ton. In the present shaft three parallel veins are found, making a five-foot ledge, the ore from which to a depth of 150 feet has given $35 to $75 a ton. A new hoist has just been erected, and Sup't D. W. C. Morgan expects to prove the mine a bonanza.

The McNulty has just been sold for $32,000. Other mines on the belt are being developed.

At Placerville,

The principal mine is the Pacific, with the well-known Thos. Price of San Francisco as president. This property is being put in shape for extensive operations. Two shafts 700 feet apart are being put down 800 feet and then connected by drift. The main shaft will be continued on down to a depth of 1000 feet before the mill is started. This ledge is 20 feet wide at bottom of present 800-foot shaft. The company owns five mines on the ledge, and has purchased the old El Dorado water-ditch. Once in operation, this property will soon speak for itself. Mr. Price regards this as the best mining property he has ever seen.

At Grizzly Flat,

The Mt. Pleasanton is running a prospecting tunnel. The North End is idle for want of water, as is the Milton. Morey's mine, a 20-inch ledge of $30 rock, is now under bond.

The Sunday will soon start up on a two-foot ledge of $30 rock. These mines are in granite.

At Garden Valley,

The Ivanhoe vein was bonded by inexperienced parties who sunk 60 feet on the dip of the vein. At this point the vein changed to vertical, but the superintendent continued on down to 200 feet in depth on the same angle, and then drifted 50 feet from the vein in the footwall.

The walls are slate and porphyry. The ledge is three feet in width, carries 20 per cent of sulphurets, and gives $6 a ton in free gold.

The Lone Jack mine is being thoroughly developed. The vein is the mother lode proper. The shaft is now down 415 feet. The vein is 45 feet wide, 10 feet of which mills $11 a ton. The hanging-wall is diorite; foot, talc-slate. The company has a 10-stamp mill which is idle during developments.

The Rosencrans, a three-foot ledge of $11 rock, joins the Lone Jack on the East, and is opened to a depth of 200 feet. This mine has a 10-stamp mill. The property is idle at present.

The Taylor joins the Rosencrans on the east. It has a 10 stamp mill and is developed to a depth of 500 feet, with 340 of drift on the 10-foot ledge of $8 rock. The property is now being developed.

Cement Mines.

The mills on this Old river channel are closed for want of water. At the Chile Ravine mine, Coon Hollow, a tunnel 2000 feet long is being driven to strike the bedrock. This will be the first tunnel to reach that depth. Naturally the project attracts considerable attention, as it promises to reveal exceedingly rich ground. Up to this time the work has all been on the upper benches. These drift mines give promise of yielding a steady output of the yellow metal for many years to come. By reason of their extent it will be a century before they are exhausted. On the line of the mother lode the land is owned by the present mining companies, or covered by agricultural patents, thus closing the door to prospectors. The eastern part of the county is still open. That El Dorado will in the near future make an enviable record as a gold mining county is evident.

Principal Towns.

Latrobe, sitting at the entrance of the county with an altitude of 769 feet, does not impress the stranger favorably, but a drive out into the Barton valley, lying back of the town, will show that in the future this section will come to the front, as the temperature is such that all of the tender fruits can be raised to a profit. If the large ranch of Mr. H. Barton should be subdivided it alone will furnish homes for hundreds of families. Latrobe is on the line of the railroad and has a population of about 100.

The next point on the railroad is Shingle Springs. Until two years ago this was the railroad terminus; now that the road is extended to Placerville, Shingle Springs has become a quiet way station, with a population but little larger than Latrobe. The country surrounding is more thickly settled, trees and vines are grown on every side.

El Dorado is but a duplicate of Shingle Springs, with perhaps two hundred inhabitants. There are a number of fruit ranches in the immediate vicinity and some very rich quartz mines. The town has the appearance of having "lost its grip;" the mines of the vicinity should infuse new life into it, but as "all roads lead to Rome" so here all roads lead to Placerville, and the trade of the county seems to have settled there.

Diamond Springs wears a neat appearance, and well she may, for here the best fruit farms begin. From this town up the hill and across to Placerville there is a continuous line of fruit trees.

Pilot Hill and Cool are small villages of but a few houses, as is Garden valley. Greenwood makes a very fair showing and gives evidence of thrift.

Georgetown is quiet, but next to Placerville is the best town in the county. The best feature of the town is the American hotel. Numerous stores well stocked and largely patronized show the section to be both populous and prosperous. Many fine residences adorn the streets and add to the look of thrift that the town wears.

Placerville is the county seat and terminus of the railroad. The altitude is about 1800 feet. The town stretches along a ravine and shoots off in spurs along the hillside. Surrounding are high hills giving the town a valley look. The population is estimated at 2500. The fact that all the trade of the county centers here brings in a large floating population and the trade of almost the entire county. By reason of this fact Placerville is unusually prosperous and wears the appearance of an inland city. While the most of the old mining towns of the county show evidences of past glory, Placerville gives every indication of a prosperous present, while the great mineral wealth of the county and the future in fruit-culture assure still greater prosperity in the near future.

Coloma is difficult of description. I think the visitor will agree with me that its appearance is such as would indicate that the Aztecs once occupied this lovely spot, but that it was in the long ago. The town wears an out-at-the-elbows look, though here and there are pleasant homes. Standing on the knoll of the Marshall monument site and looking down upon the town and across the river to the green fruit orchards with the encircling hills, while the river runs lazily by, unheeding Marshall's finger as he points from his monument to the spot where gold was first discovered in California, the view is beautiful in the extreme. Why Coloma has not been sought out and her beauty enjoyed by large numbers of visitors is difficult to understand, as the Coloma Vineyard hotel offers every comfort to the visitor, though the neglect of this fine vineyard must strike the visitor as little else than sinful. From the immediate vicinity of Coloma are shipped the greater portion of the best fruits grown in the county.

Water Supply.

The middle fork of the American river with its branches—the South Fork with its branches, Blackrock, Greenwood Rock and Silver creek on the north—Weber, Plum, Mill, Alder and Alpine creeks on the south, with numerous smaller creeks, spread all over this immense basin. On the south the Cosumnes with its various forks and tributaries form a complete network over the southern portion of the county.

The California Water Co., El Dorado Ditch Park, South Fork, Gold Hill, Iowa, and Weber canals carry water to all parts of the upper section of the county, from Lotus on the north to Shingle Springs on the south, including about seven-eighths of the area of the county, brings the rancher and fruit-grower within the reach of the city markets in addition to those of the county.

E. H. SCHAEFFLE.

The Stewart Mining Bill.

EDITORS PRESS:—I hope you will, in your valuable journal, oppose the proposed Stewart Mining Bill for the following reasons:

1st. Miners are willing to develop and spend $100, and more, too, on their claims. But speculators and farmers who do not farm would like to have a *law* that would only compel them to post notices, renew them, and scratch the surface, holding the mining ground from year to year without making any improvement.

2d. It is absurd and unjust that a miner who has abandoned a claim should not after a lapse of time relocate the same; he might by a new exploration make a valuable discovery, covering the identical ground that was claimed by his first notice.

3d. Inside of a year after a location the miner should have sunk a shaft or run a tunnel

of at least 12 feet, and the same amount of work to be done every year.

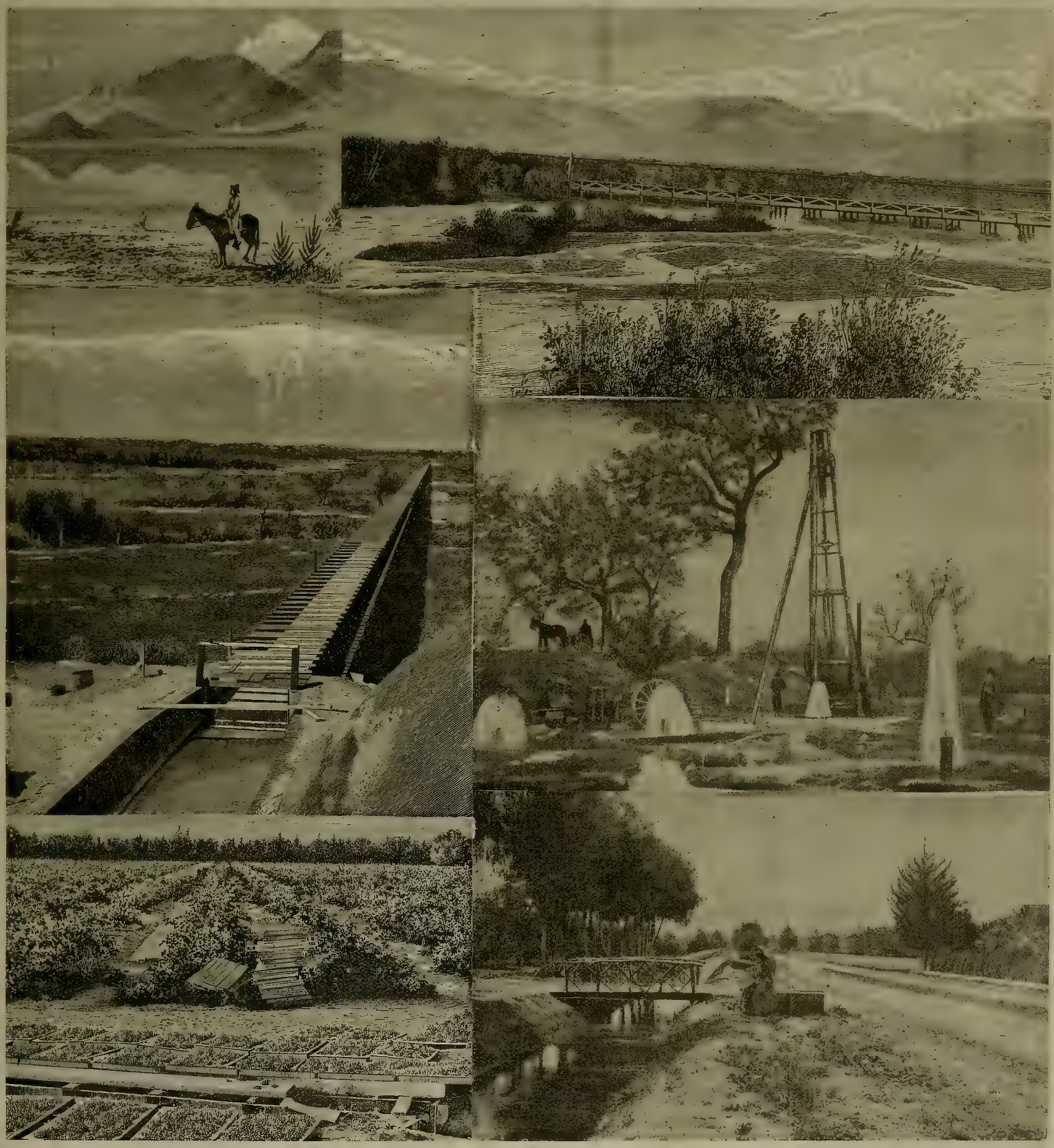
4th. Absurd that a miner should go and post a notice of abandonment.

5th. It is very inconvenient and expensive that a miner should file an affidavit with the County Clerk that he has made $100 worth of work or improvements on his claim. Miners will find out if the requirements of the law have been complied with. E. C.

MINA DE MULATOS.—Last week Alvinza Hayward, representing a syndicate of English and San Francisco capitalists, purchased from Wincesloa Loaiza, acting for the Mexican owners, the Mina de Mulatos, a valuable mining property situated in the State of Sonora, for $1,575,000. The mine has been worked for over 80 years, but Mr. Hayward is evidently confident of the wealth yet hidden away in its recesses, for he has taken a 55-per-cent interest in it, and has mortgaged his property in this city to the sum of $865,000 to pay for it. The remaining 45 per cent is in the hands of London capitalists. Sixty stamps are at present dropping on quartz that assays from $10 to $13 a ton and of which there is a whole mountain. The mill will shortly be increased to 100 stamps, and every appliance of modern mining industry will be used to develop the wealth of the property.

From Waste to Wealth.

Figures rightly used are strong supports for argument, and accurate descriptions produce deep impressions, but neither statistics nor word-painting appeal so forcibly to most minds as the significant lines of the artist or the unerring representation of the camera. These facts are suggested by a study of the composite engraving on this page. We doubt whether a volume of orchard reports, assessor's figures or eloquent description could teach so forcibly the story of the deeds of water in California as do these few pictures arranged in the order of their industrial sequence. A few words of interpretation will place all in the way of obtaining their meanings.



FROM WASTE TO WEALTH—THE WONDER-WORKS OF WATER ON OUR ARID SOIL, AS ILLUSTRATED AT RIVERSIDE, CAL.

In the greatness of its transformation from waste to wealth Riverside is typical of the service rendered California by irrigation enterprises. What Riverside was in its natural condition is shown in the little sketch in the upper left-hand corner—an expanse of arid land supporting a population, according to some accounts, of a single sheep-herder. But above the expanse are the snow-capped mountains, treasure-houses whence are to be drawn the future wealth of the region.

In the next picture appear again the snow-capped mountains, and at their base the Santa Ana river, which for ages has sought the sea through a wide belt of moist lands, while the rich mesas burned in the sun and were thought worthless.

Adjacent to the river scene is a glimpse of the artesian wells, through which the pierced earth gives forth abundant water from unseen streams also pursuing their course from the mountains to the sea.

On the left again is the flume carrying the precious fluid from river and well flow miles away to the land, which, at its touch, becomes fruitful beyond compare. In the wells and the flumes are suggestions of the enterprise which is needed from mankind to make available the water treasures of the mountains and the soil riches of the arid lands.

And then the results—need they be more than suggested? Where the lone sheep-herder of 18 years ago looked out upon the arid plain, there is now a population of 7000. Twenty years ago the assessed value of the territory was $3500; now it is $4,000,000. But one does not need such data for forming judgment. Contrast the desert of the upper corner of the engraving with the profuse production indicated by the vineyard scene or the improvement of the landscape as shown in the view of the growth of ornamental tree and shrub, all of which appear in the lower divisions of the engraving.

THE MONTERREY "LOST MINE."—The long-lost treasure in Carmel valley didn't amount to anything. All experienced miners who have seen the rock and claim pronounce it worthless. There is some lead and iron, with the slightest possible trace of silver. All this country has been prospected thoroughly and considerable money expended in trying to find it. The tools young Foreman found are some that have been abandoned by former prospectors. Olsen & Foreman have quit work on their claim, and the Old Woman's mine is still undiscovered.

A NATURAL-GAS WELL IN SALINAS.—Under date of Sept. 25th it is reported that Daniel Coy has been having a seven-inch well bored on his place, and when a depth of 66 feet was reached a flow of gas was struck which is now sending up a flame six feet high.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Calaveras.

THE DROUTH AND MINING.—Calaveras *Prospect*, Sept. 28: The drouth has affected mining interests to a considerable extent, and those mining enterprises dependent on water as a motive-power had to suspend work altogether or to limit the number of employes. The Norfolk Co. ceased work entirely, and the superintendent, J. B. Moore, went East. But we are pleased to note that miners have again gone to work preparatory to active operations when water insures a continuance of an abundant water supply. Across the Stanislaus, the Sailor Boy, near the Collier district, is sailing along with flying colors, and three shifts running. A rumor reaches my ear that they have struck in the tunnel a narrow but exceedingly rich ore streak. The Total Wreck, adjacent to town, is working one shift only. The superintendent has moved his family to town, and more active operations will be the order in the near future. The shaft has attained a depth of over 100 feet; the vein at this depth is three feet wide; water retards the working at the depth, and a pump will soon be placed in position. The Beatrice in close proximity and running parallel to it, though not worked at present, still claims the attention of mining men, several of whom have inspected it quite recently. Sperry's iron mine, within two miles of town, is being worked by tunnels, and the outlook is very encouraging for a remunerative property; gold and silver is found in the ore, and it is probable that it will pay to work for these minerals alone. George Sperry of Stockton is the principal mover in this enterprise.

THORN MINE.—*Citizen*, Sept. 28: In what is known as the Bear Mountain district there is known to be some very rich quartz, floats having been found in various places and good prospects in many instances. Last Saturday we visited a prominent mine in this section—the Thorn—on the Copperopolis road, about five miles from this town. Mr. Thorn has had two shafts sunk upon the claim—one 40 feet and another 80. About 50 feet from the 80-foot shaft the new management, under the superintendency of Mr. Arrowsmith, has sunk a new shaft, which has now reached the depth of 100 feet, and levels are being run from here north and south through a fine quartz vein. From an old cut run by Thorn, about 75 or 100 feet from the new shaft, we took a handful of loose quartz, which when pounded up in a mortar showed more gold than could be taken up on the point of a penknife, and we found the same good prospect anywhere on the seven to ten foot vein. The vein at 100 feet will also show gold and an immense quantity of rich sulphurets.

El Dorado.

LONE JACK.—Placerville *Observer*, Oct. 1: The shaft at the Lone Jack mine, Garden Valley district, is down 400 feet. At that depth they have 14 feet of ore, showing gold and a fair percentage of sulphurets. The full width of the vein is not yet known, as they have not cut to the east wall, nor do they intend to do so until they have reached a depth of 600 feet.

DONCASTER.—At a depth of 114 feet in the Doncaster mine, they have struck a volume of water, making it impossible to sink deeper with a horse-power whim. The company will probably run a tunnel from its millsite, from which point they can strike the ledge about 225 feet below the surface. This will give them a large body of ore to work, as the ledge of pay ore at the bottom of the shaft is about 9 feet wide. The ore is of a good grade.

ROGERS.—At the Rogers mine at Smith's Flat, they are now working in a bench of cement gravel supposed to be extensive and of high grade. Mr. Fred Benfeldt, an old gravel miner, who is well acquainted with mines in that district, gives it as his opinion that there is enough practically in sight to keep the mill running for years.

FREE GOLD.—The shaft at the Bobby Burns mine at Blair's district is down nearly 80 feet. The ore at water level seems to increase in richness, showing more free gold and a greater percentage of sulphurets. The ledge at the bottom of the shaft is about 5 feet wide.

Inyo.

LOOKOUT DISTRICT.—Inyo *Index*, Sept. 25: Frank Fitzgerald, lessee of the Modoc Con. mines, has resumed work on that property; he will also start up on the Minnietta property about the first of October.

CERRO GORDO is fast returning to its old-time glory. The Union Con. now has 50 men employed and the force is being gradually increased. Supt. Farrington is in charge, with James McDonald as foreman.

Nevada.

THE ELEVATOR PROCESS.—Grass Valley *Union*, Oct. 2: The plan that the Milton Mining Company, at French Corral, is adopting to work its gravel claim at Empire Flat is regarded with much interest by the people of the vicinity, as upon its success there will be a partial return of former prosperity to that portion of the ridge. The former hydraulic operations of the company removed a large amount of gravel, and has left a basin at French Corral which will hold an enormous quantity of debris, if the plan of raising the gravel by the hydraulic-elevator plan at Empire Flat, one-half mile distant, proves practicable. This plan is to force the gravel from the bed of the claim up an incline plane by means of a powerful stream of water under pressure, the gravel raised in this manner being deposited in a sluice lined with the usual gold-saving appliances, and from thence passing off into the basin in which the debris will be impounded. This is a much more expensive mode of hydraulicking than by the ordinary mode, as it requires a large amount of water to remove a much less amount of material. To make such mining profitable, the pay gravel must be good, otherwise the cost of the water would eat up the profits. In the case of the Milton Co., it owns its canal and water, which will lessen the cost of the proposed operations, but as to companies owning gravel ground and compelled to purchase water at the usual rates, it is considered that the elevator process could not be made profitable. With the Milton Co. its present enterprise may prove profitable, as the ground is considered good, and by the plan adopted the work can be carried on without any violation of the injunction restraining the company from running mining debris into the rivers or their tributaries.

EMPIRE.—*Tidings*, Sept. 30: It was not intended until the last moment to lay off the majority of the day's-pay men at the Empire until tonight, the last of the month. Those drafted number but 50 men and boys, the majority of whom have already selected tribute pitches in the mine, while others will bid for contracts. The tributers and contractors at the Empire, numbering about 80, have been making from $2 to $3.50 a day right along, and the men laid off Saturday evening will undoubtedly do as well. In the meantime the work of sinking the shaft will be pushed with all speed, and within four months it is confidently believed an increased force of miners will be at work on day's pay. All indications point to the consolidation of the ledge at or about the 2000 level, such as occurred thrice previously in the history of the mine. The "old Empire" will outlast mines yet unknown.

THIRTY DOLLARS A DAY APIECE.—Nevada *Transcript*, Sept. 27: Chas. Adolph and Will Hart have just concluded a rather unusual but profitable mining operation in the ravine just south of the city plaza, where L. C. Keith's custom quartz-mill stood so many years. In seven days' washing of the sands and dirt they cleaned up $420 worth of amalgam, which gave them $30 a day apiece for their labor. The gold had escaped from the mortars and run off in the waste. They are looking around for more old mill-sites.

THE HARTERY.—*Tidings*, Oct. 2: Steam was turned on at the Hartery, Monday evening. The machinery ran smoothly and to the entire satisfaction of contractor and superintendent. An eight-inch pump is now being put in the incline and will be ready for business by the last of the week. The shaft is 600 feet in depth, with a drain tunnel at the depth of 225 or 250 feet. As the workings, aside from the shaft, are not extensive, it is expected to have the water out within a month.

HOISTING WORKS COMPLETED. — *Transcript*, Sept. 29: C. C. Weisenburger, who had the contract for constructing the hoisting works on the Harmony drift claim, a short distance northeast of town, made an excellent job of it. Steam was started Wednesday and a trial run made, all the machinery moving smoothly. The works will begin Monday to run regularly. The incline shaft is down 135 feet and has nearly 200 feet more to go to reach bedrock.

EMPIRE MINE.—Grass Valley *Union*, Sept. 29: A number of Empire miners were laid off yesterday, leaving but few underground men at work except tributers. The Empire has not been looking well for some time, but the prospecting operations that are going on are expected to lead to favorable development. The old mine has had a number of ups and downs in its long and eventful history, but it always comes up smiling in the end.

NORTH STAR DIVIDEND.—Grass Valley *Union*, Sept. 28: In to-day's *Union* will be found a notice that the North Star Mining Co. will pay a dividend of 50 cents per share on and after the 30th inst. The dividend will aggregate $50,000, which makes the fourth one of that amount declared by the present company. The mine is now yielding good returns and giving promise of future large dividends.

Placer.

PICK AND SHOVEL.—*Herald*, Sept. 28: Report has it that the mill at the Drummond quartz mine is running and the ledge promises well. Work in the Mountain Gate mine at Damascus has been suspended. The main tunnel at the Red Point is being driven ahead. Superintendent Dodge is still running prospect drifts in the Baker Divide claim. Hoisting works will be put up at the Bellevue in a few weeks. At the Hogsback they are boring to find the distance to the channel. Wm. Grinnell has charge of the Breece and Wheeler mine. Some 18 men are employed. Harry Adams has been putting the Red Sea mine at Yankee Jim's in shape for work this summer. The White boys took out $4000 from their mine last week. The ore is rich in sulphurets and specimens, and is good milling ore also. But little mining is being done in either fork of the American. E. Kavanaugh is working a few men on Horse Shoe Bar, and Stewart and McGillivary are working at Little Pleasant Bar. They have not had a very successful season. Superintendent Chappellette is taking a much-needed rest. The opening of the Mayflower mine was accomplished through his energy and skill, and but few are aware of the vast amount of labor performed by him in bringing the great undertaking to a successful issue. The tunnel at the Gray Eagle is 6x7 feet in size, and is in a little over 130 feet. The rock is rather hard. A fine iron track has been laid. The compressors and other machinery for running the Burleigh drills are expected to arrive by the 5th of next month. T. G. Durning has been superseded in the superintendency. The boarding-house at the Eclipse is virtually finished. Some very rich ore has been taken from the east shaft. Hoisting works will be put up as soon as the machinery arrives. A mill will also be put up this winter. The Mayflower mine shows no decrease in its output. Prospect drifts are being run toward the east rim. No new developments have been made in the Orono (?) channel. As an instance of what a comparatively small amount of gravel will yield can be mentioned the result of washing the boulders taken from this mine. After being run out and all the loose gravel knocked off, the boulders were dumped and water was turned on; $1600 was cleaned up at one time and $800 at another. About the same number of men are employed right along. Twenty stamps are kept going night and day.

FOREST HILL.—Placer *Argus*, Sept. 28: Rumor is afloat that the Paragon mine at Bath has struck another rich streak. The Golden Fleece has struck rich gravel, and the owners are very proud of it. The Hogsback claim has shut down, owing to the tunnel being too high, and at present nothing is being done; but it is to be hoped it will soon begin again. The Hidden Treasure mine is again putting on hands, some of which were dropped a month ago, owing to enlarging the gangways.

IOWA HILL.—Cor. Placer *Herald*, Sept. 28: The Horman mill is running night and day crushing about 30 tons each 24 hours. It is reported here that the cement is very rich, running as high as $100 per ton. The Morning Star is putting in the wood necessary for winter use, and report says that the new management takes hold on the 20th. The Drummond mill has been running steadily for two weeks; whether the result is satisfactory or not, no one knows. The Pioneer Co. is, I am informed, engaged in pushing ahead its tunnel and prospecting. The Red Point is driving the main tunnel to the east, and hopes in a short time to be taking out pay grit. There is about the usual amount of annual work being done on the upper divide. The Washington Co. is prospecting its drift tunnel with all the speed possible.

Shasta.

MIDDLE CREEK.—Redding *Free Press*, Sept. 28: The Ottawa mill is running on full time. The Gem is running Sundays and all. The Iron Mountain Mining Co. is shipping a carload of iron ore below. C. Elliot of Flat Creek is opening up a good prospect, promising to be a bonanza. Andy Fife is running his mill on Flat Creek on good ore. The Walker mill, which was removed from the old works to the river, will be ready for operation on the first of the month. The Calumet G. M. Co. is only running one set of stamps on account of the scarcity of water, which will be overcome as soon as rain sets in. Reno and Musser have discovered a good prospect on Spring creek which promises to be a true-fissure vein, and an extension of the Last Chance. F. E. Whipple has bonded his mine to Steve Hill. Steve proposes to develop the same. We understand that he has outside capital interested. Anderson and Berg of the Middle Creek mine are developing their mine. They will ship a carload of quartz from Middle Creek next week. The Hartman mine is running two shifts, day and night, driving a tunnel to connect with the shaft, and some fine ore is being taken out. The intention of the company is to build a mill at Middle Creek and run a tramway to the river.

Sierra.

CHIPS.—*Mountain Messenger*, Sept. 28: A small run of ore from the Chips mine is being crushed at the Marguerite mill, and promises to prospect well. It was estimated that the rock ought to pay from $8 to $10 a ton. Mr. Locke, who is prospecting the mine, seems to be satisfied with the outlook.

MARGUERITE.—The work of freeing the Marguerite mine from water progresses satisfactorily. The new pumping machinery works like a charm so far, there being ample power for that purpose. At this writing the shaft is rapidly being freed from water, and it will not be long before the work of taking out ore will be begun. Mr. Morris, the superintendent, deserves a great deal of credit for the successful prosecution of this work.

GOLD BLUFF.—The work of taking out ore from the shaft at the Gold Bluff mine is progressing. The hoisting machinery is said to work smoothly and well, not requiring more than 15 or 20 inches of water from the Costa ditch to run it. Some very rich rock is being taken out, and the mill is running night and day.

THE Oxford Co. is repairing the road to the mine preparatory to getting in supplies in the near future.

Siskiyou.

GOLD.—Yreka *Journal*, Oct. 2: The Montezuma mine at Callahan's has been sold to a Chinese company in San Francisco for $50,000, with $10,000 down and $1000 per month for 40 months. This is the second largest sale of mines ever made in Siskiyou county, the Black Bear quartz mine at Salmon river being the first. These Chinese have wanted the mine for a long time, but the property has always been held at $60,000, and on getting the owner's lowest figure they accepted and are highly pleased with their bargain. The mine has produced a large amount of gold, and is not half exhausted. It is believed they will make the purchase-money all back in two years, and will then have a mine to last them for many years. It is currently reported that J. B. Eldridge has succeeded in disposing of the Steamboat mine on McAdams creek to a New York Co., and is daily expected from the East to begin opening this celebrated mine by a drain tunnel, and when opened it will prove to be one of the most extensive drift mines in Northern California. The hydraulic mines in Quartz Valley and Oro Fino are being fitted up for the expected wet winter. The Campbell mine, in particular, is about ready for water, and bids fair to beat its former record in the product of gold during the coming season. Capt. Wilbourne, backed by a San Francisco company, is now running a tunnel on the south side of Klamath river, in the Cottonwood district, opposite the Jillson & Co. claim. Jillson & Co. on the Klamath, near Cottonwood, have their hydraulic machinery and ditches in good working order for the winter, and expect to make a big success in piping a strip of good pay gravel ranging from 10 to 80 feet in width. The parties who bonded the old Empire ledge on Empire creek, Klamath river, for $10,000, have sunk a shaft and found a fine wide ledge, which prospects exceedingly well, and is destined to prove a bonanza. They will open it out in a good manner for taking out quartz, and expect by next spring to have a large amount of quartz on hand to start up the fine water-power mill near the ledge.

Tehama.

THE CHROME MINE.—Red Bluff *People's Cause*, Sept. 28: E. Hickman came in yesterday from the Chrome mine. He has just completed building five miles of road, leading to the mine from the county road near George Eaton's place. The mine is being rapidly developed. A platform is being built four miles from the mine, 50 feet long by 10 feet wide, to be used as a dump, where the mineral will be deposited after being taken from the mine. It will be hauled to the dump by light teams, and will there be loaded on to large wagons and hauled to town and shipped. Teamsters commenced hauling to the dump Thursday. Next week a number of large teams will be put on to haul into town. There are 300 tons of the mineral now in sight, and those who have examined the mine say it is inexhaustible. Mr. Knight, who is to superintend the shipping, is expected here from San Francisco, Saturday.

Trinity.

MACHINERY.—Trinity *Journal*, Sept. 28: Teams have been going through town this week loaded with machinery for the North Star mill, which will be erected on the North Star property in East Fork this fall. Times are lively around French Gulch now. Jack Conant has bought the Wheeler mine. Harrison Cox and son have struck a prospect near the Gulch which bids fair to develop into a good property.

CANYON CREEK QUARTZ.—Geo. Bailey was in from Canyon Creek this week and gives us the following items in regard to quartz discoveries in that section: Bailey & Flowers have two locations on the mountain between Canyon Creek and Stuart's Fork called Lookout and Mountain Echo. They have three parallel ledges on the locations. Two of the ledges have been tapped by two tunnels at a depth of 70 and 80 feet respectively, and both ledges show up better than on the surface. Ledge No. 1 is 40 inches wide and carries free gold and sulphurets. It is between well-defined walls, there being four inches of gouge matter on the hanging-wall—a good indication. Ledge No. 2 has been struck by a tunnel at a depth of 80 feet. Drifts have been run in two directions on the ledge, which is 3½ feet wide between the walls and prospects well—better than on the surface. He recently found the ledge on the surface 1200 feet distant from present location. The surface ledge when found is three feet wide and prospects very well. The boys have a good showing for a valuable property. There is plenty of timber for all mining and milling purposes on the claim and plenty of water to run a steam mill. On the 18th inst. Dedrick & Carlson found a ledge about half a mile west of Bailey & Flowers' locations which looks well. In panning up to it the dirt yielded 10 cents to the pan. They have a good, strong ledge about two feet wide with indications of its widening. They have traced it on the surface 2000 feet. Mr. E. M. Benjamin of Junction City is a partner in the location. Last Sunday, while out hunting, Gil. McCarthy found a ledge in a curious manner. He saw quartz clinging to the roots of an uprooted tree, and prospecting, found a ledge which prospects well. Grigsby's prospects look very well. He purposes putting up a small mill or an arastra this fall.

Tuolumne.

BONANZA.—Tuolumne *Independent*, Sept. 28: The Bonanza mine, which was thought would start up on the new shaft the first of the week, did not, as the engine proved incapable of doing the work. The entire works, including the shaft, have been covered with a commodious and substantial building, which gives the plant the appearance that its owners mean business. The shaft has been boxed in a strikingly mechanical manner, and a new self-dumping skip placed in position, and works like a charm. It is the only skip of the kind in this immediate vicinity. Work will be resumed on the new shaft as soon as the present engine can be replaced with a larger one, which will be as soon as possible.

TIOGA DISTRICT.—*Democrat*, Sept. 26: Indications point to a mining boom in Tioga next spring. A letter from the company in San Francisco to a gentleman in town states that as early as possible next year they intend to commence operations, and we have it from a reliable source that the Curtin brothers have been engaged to haul machinery to Tioga in the spring.

NEVADA.

Washoe District.

CON. CALIFORNIA & VIRGINIA.—Virginia *Chronicle*, Sept. 28: The usual quantity and grade of ore is being extracted from the various openings on the 1400, 1435, 1500, 1600, 1650 and 1950 levels. Continue to stope ore of good quality from the point of connection between the northeast drift from the top of upraise No. 2 above the 1600 level. During the week 1088 tons and 1090 pounds of ore were shipped to the Morgan mill and 1695 tons to the California. The average assay value of all the ore worked at these mills during the week, according to battery samples, was $27.55. Shipped during the week bullion valued at $11,000 to the Carson mint. Bullion valued at about $58,000 on hand.

CONFIDENCE AND CHALLENGE.—The 500 level joint Imperial north drift is out 980 feet from the Yellow Jacket shaft and continues in quartz and porphyry. The east crosscut from this drift is in 85 feet, showing clay in the face.

NORTH GOULD & CURRY AND EAST BEST & BELCHER.—The northwest drift to connect with the North Gould & Curry workings is out 21 feet. The ground is growing softer and more rapid progress will be made next week.

UTAH.—During the week extracted and milled 320 tons of ore showing an average assay value of $17.20 per ton. Bullion valued at $6172 shipped to Carson mint. Concentrates on hand valued at $7000.

OPHIR.—On the 1300 level the east crosscut from the shaft station, to connect with the top of the raise above the 1465 level east drift, is extended 148 feet, face continuing in porphyry showing some quartz.

HALE & NORCROSS.—West crosscut No. 1 on the 300 level is in hard vein porphyry. No. 2 is in hard quartz assaying from $7 to $10 per ton. New prospecting drifts are being advanced on the 1200 level.

MEXICAN.—On the 1465 level the north drift from west crosscut No. 1, 200 feet in from the lateral drift, is advanced 416 feet, continuing in porphyry and lines of quartz with some water.

BELCHER.—No. 1 east crosscut from the winze bottom on the 1200 level is out 30 feet, the face in low-grade quartz. The 200 level west crosscut continues in porphyry and clay.

IMPERIAL.—An east drift is being advanced from the winze bottom below the 300 level to connect with the Imperial shaft. The 300 level west crosscut is in low-grade quartz.

SIERRA NEVADA.—On the 520 level from the main east drift, 1185 feet from the shaft station, a south drift is advanced 182 feet. Formation, porphyry with some water.

OVERMAN.—The south drift from the winze bottom is out 45 feet in quartz, carrying fair grade ore. The incline raise is up 70 feet, showing quartz and porphyry in the top.

SEG. BELCHER.—The 1100 level east crosscut is in 270 feet, showing porphyry and low-grade quartz. The 1000 level south drift has connected with the raise above the 1100.

BEST & BELCHER.—On the 550 level, from the northwest drift, 148 feet in, east crosscut is advanced 18 feet. Formation, porphyry and clay with streaks of quartz.

SAVAGE.—Usual progress made in extending 300 and 400 level explorations without important change in formation. Extracting ore of good quality from the 500 level.

NEW YORK CON.—Still stripping ore in drifting north and south from the raise above the 800 level.

GOULD & CURRY.—On the 300 level, at a point 230 southwest from crosscut No. 1, an east drift is

advanced 30 feet. Formation, porphyry with streaks of quartz. On the 400 level west crosscut No. 1 is extended 344 feet. Formation, porphyry.

ALTA.—The mill is now dropping 15 stamps, crushing 45 tons of ore daily. Battery sample assays show a value of about $30 per ton.

CHOLLAR.—The winze below the 200 level continues in low-grade quartz. No important change in formation in advancing explorations at other points.

UNION CON.—On the 1465 level the north lateral drift is advanced 443 feet, from the south line, continuing in porphyry and clay.

SILVER HILL.—Usual progress made in 160 and 260 level explorations, with favorable indications for finding ore.

ALPHA.—The 382 level east crosscut continues in low-grade quartz. The shaft is down 50 feet below the 500 level.

POTOSI.—The 850 level south drift is still penetrating vein porphyry. No change in formation at other points.

YELLOW JACKET.—The 500 level west drift is out 670 feet. The daily ore shipments average 50 tons.

EAST SIERRA NEVADA.—The 520 level south drift is out 60 feet and continues in porphyry.

WARD COMBINATION SHAFT.—A west drift has been started from the 1050 level shaft station.

CROWN POINT.—The 700 level south drift is out 263 feet, the face in porphyry and quartz.

CALEDONIA.—West crosscut No. 2 is in 32 feet, the face showing porphyry.

JUSTICE.—Crushed 224 tons of ore assaying about $23.22 per ton.

EXCHEQUER.—No change in formation in 382 level explorations.

SCORPION.—The 520 level south drift continues in porphyry.

BALTIMORE.—Ore showing in 338 and 225 level explorations.

NORTH OCCIDENTAL.—Continue stoping ore from the 450 level.

ANDES.—The 350 level west drift continues in quartz.

Belmont District.

LAITY.—Belmont *Courier*, Sept. 28: Folsom's big team pulled out for Austin on Monday last, laden with silver ore from the Laity mine, in East Belmont. This ore will be worked at the Ledlie Reduction Works. The mine is looking better and better as the work of development is advanced. The ledge is now 8 feet in width, and is widening as the work of sinking progresses. The ore extracted is of a good quality. With continued work this property is making a good showing.

Columbus District.

REPORTED RICH STRIKE.—Virginia *Enterprise*, Oct. 1: Last week a rich strike of ore was reported in Hawthorne as having been made in the Columbia mine, which adjoins the famous Mount Diablo in Candelaria. Rumors made the strike 30 feet wide and the ore running from $50 to $200 a ton. Miners acquainted with that ground and the grand history of the Diablo property have been looking for years for an important strike there, and they were not at all surprised at the report, and readily accepted it as true. If so, its importance is incalculable to that section of the country, as it will go far toward demonstrating the permanency of Candelaria's mines.

Reese River District.

WORKING AT JACOB'S DUMP.—Reese River *Reveille*, Sept. 27: Richard Burrows, L. Adkins, Henry Welch and Fred Meyer have begun to run a tunnel from both sides of the Jacob mine dump, to get under and take out the quartz covered up, and send it to the concentrator. They are paid so much a ton, by the company, measured by the grade of the ore, and the two latter above mentioned have been collecting dump rock all summer, and have done fairly well.

ARIZONA.

CRUSHING ORE.—Prescott *Courier*, Sept. 26: Now that the weather in Black Canyon district is cooler, Geo. Zika and many more miners are getting their arastras in shape for crushing ore. Perry & Helm will do some arastraing on lower Agua Fria. Reports from Harqua-Hala district are satisfactory. The Bonanza mine is yielding rich ore. The ore body in the Hillside tunnel is three feet thick and very rich. Placer miners of Weaver and Antelope are making pretty good wages. The Roach & Mulvenon mine, Turkey creek district, will soon make another shipment. The Oro Bella Co. has let a contract for 800 cords of wood for their mill. They propose to add 10 more stamps this fall. Crowned King Co.'s mill is running. We believe that their ore is now roasted before being milled. The Ryland Co. have men sinking and drifting for more water. Supply is constant y increasing. Their ore body is said to be 12 feet thick. It is not high grade. The gold is free, so there is no necessity for assorting.

SAMPLING WORKS.—Mohave *Miner*, Sept. 28: The Arizona Sampling Works have, during the past week, shipped nine carloads of ore. During the past month something over 231 tons have been shipped, being about double the amount shipped for the corresponding month last year.

THE WORK of driving the lower tunnel of the Little Boy mine, Todd Basin, is progressing favorably considering the character of the ground. As there are something like 200 feet to be run, it will be some time before connection is made with the main shaft.

A BODY of high-grade gold ore has been encountered by the Rogers brothers in their claim at Blow-pipe Flat, near Chloride, and knowing ones report its extent and richness as exceeding anything heretofore found. This mine is opened sufficient to justify a small mill, and the owners are making arrangements to that end.

SUPT. MACKENZIE will in a few days resume work on the Cupel mine, Stockton Hill. The mine is at present full of water, and pumping it down to the 200-foot level, at which place good ore was left, will require ten or twelve days.

TIP TOP.—Cor. *Journal Miner*, Sept. 28: Work in the mines here is steadily going on, and while there have been no phenomenally rich strikes, nearly all are fairly prosperous. B. C. Williams, John Taylor and Harry Norton are working on the Seventy-Six, and while taking out considerable ore of excellent quality, are also doing good work in developing the mine. Theo. Wade, Harvey Helm and John Siss are working a lease on Ensign and Helm's Pin Pool mine, and are doing finely. A. Bauer & Co. are working at their lease on the old Tip Top. The extensive plant of the St. Louis-Yavapai Co. still remains silent, though why this is thus no one can say. The people here would be pleased to see it once more in operation and giving employment to its many hands.

COLORADO.

LEADVILLE.—*Herald Democrat*, Sept. 26: The Small Hopes people are still doing their regular work, shipments being about the same as when last noted. Most of the ore is hoisted from the Keren and Casey shafts, while the drifting from the 500-foot level of the McCormack shaft is still being driven ahead. At this point a large body of iron sulphides was encountered, which is opening out and the grade steadily improving. Sinking on the Chadbourne shaft has been resumed, and it is going down at the rate of 4 feet per day, a set being placed in position each 24 hours. The shaft has now attained a depth of 535 feet, and, with the connection made with the original shaft, the workings are thoroughly ventilated. Shipments remain about the same. In the south drift of the R. A. M. another large and valuable body of ore has been encountered during the past week, shipments from which will be considerably delayed on account of the air being so bad in that portion of the mine that but two or three men can work there at present. At the breast of a drift about 160 feet in length from the 235 level, the lessees on Pittsburg No. 9 have encountered a good body of lead carbonate ore, as well as a large body of argentiferous iron, from which they are shipping right along, and working the mine to a great profit. Mr. Holden has again started up on No. 1, Robert E. Lee, the cage shaft, and is breaking iron preparatory to shipping on a large contract which he has made with one of the Leadville smelters.

DAKOTA.

ACTIVITY AT GALENA.—Deadwood *Pioneer*, Sept. 26: James Conzette and Sheridan McBratney report great mining activity at Galena. Work is in progress on a number of claims. Lessee Havens has a force of 14 employed at the Richmond-Sitting Bull and is constantly shipping ore. Huyett & Fargo are operating the Cora, while Conzette is developing the Alexander and other claims in which himself and Seth Bullock are interested. Besides these, a number of other properties are receiving attention. A scarcity of miners alone prevents more extensive operations. Everybody wanting work can get it. Conzette has had difficulty in getting additional forces, and has therefore been compelled to, in a measure at least, curtail operations. Many good mines are being developed and the camp is prospering.

THE LIDA GROUP.—The *Pioneer* mentioned a few days ago that a body of very good ore had been struck on the Lida group of mines, Elk creek. Enough ore, some 15 to 20 tons, for a test run has been taken out. This will be milled at the Uncle Sam. The mine has been closed down for the season, owners, however, intending to inaugurate extensive developments early next spring.

IDAHO.

ANTELOPE DISTRICT.—Cor. Wood River *Times*, Sept. 21: The long suspension of work on the most noted mines at Era and in that vicinity has caused the virtual abandonment of many excellent prospects along the Dry Fork of Antelope, but now that the Hub company has commenced operations on a large scale, and the running of the Bannock mill at Era is assured, attention is again directed to this promising district, and very few claims there will be left unrepresented. The chief point of interest at present, however, is the group of locations known as the Lead belt, and lying on the waters of the main Antelope about eight or ten miles from Era. Here a few resolute and energetic prospectors made locations in the spring and summer of 1886, and ever since that time they have, in the face of adverse circumstances, kept constantly at work, and the amount of development work that has been done here by poor men, working alone and unaided by outside resources, is indeed surprising. In crossing the divide between the valley of Dry Fork and Antelope creek we first come to the claims of W. H. Brown—the Bayhorse and Redbird. He has driven 200 feet of tunnel, and has quite a good showing of ore. Next to Mr. Brown's, on the west, lie the claims of John Buchan, one of the first locators of the district. I am credibly informed he made a shipment of ore which netted $119 per ton. Next in order comes the Cliff No. 1, owned by John Emory, Wm. Wiley and A. A. Bonham. Here we find a shaft 45 feet deep, 250 feet of tunnels, and a winze 35 feet deep, over half the work being done on and along the ledge. They have about 150 tons of ore on the dump which carefully selected sample assays show to be worth about $45 per ton. The next adjoining claim is the Carbonate, owned by Dr. McKay, Mr. Brown of Hailey, and Samuel Sheridan. Here a pocket of ore was found, from which several shipments were made, of sand carbonates, which netted the owners $113 per ton. The Tom Thumb, near by the Carbonate, owned by McKay, Cederholm & Brown, is a magnificent prospect. The Lola lode, owned by M. B. O'Dell of Era, is justly regarded as a splendid property. After driving over 250 feet of tunnels, in what many call wild-goose chasing, Mr. O'Dell has at last found ore, samples of which run as high as 210 ounces per ton.

DICKENS-CUSTER.—Cor. Ketchum *Keystone*, Sept. 28: The Dickens-Custer Co. has resumed operations in earnest. For nine years past the General Custer mill has been slowly grinding away, until its output is something over $7,000,000; with the mines now showing better than ever, with new strikes being made daily, and with cheaper transportation, one cannot help but think that Custer and the Custer-Dickens Co. are commencing on a new era that will redound to their benefit, and the existence of the latter will therefore prove of incalculable benefit to Custer and Alturas counties in particular, and the new State of Idaho in general. G. B. Baldwin and Mose Stover are in from Seafoam and report the season's development as generally satisfactory. The Lucky Boy force is already increased to 50 men, and increasing daily. The Dickens is working 10 or 12 men, the Washington about 10, the Fourth of July about 50, with 15 men on Estes, and several others scattered on different properties. The McGowan Brothers and Banjo Bill have opened a fine property at the head of Five-mile creek and are preparing to work all winter. Parties who have seen it report eight inches of 180-oz. ore for 30 feet long, and growing stronger in breast of drift. Pete Johnson's crew have finished framing the timbers for the mill and are now on the hill erecting the same. If the weather permits, this mill will be dropping stamps yet this fall.

ELECTRICITY IN MINING.—Montana *Mining Review*, Sept. 28. A new departure in mining in the Northwest is contemplated by some of the Cœur d'Alene mine operatives, and it is said that electricity will shortly be the most important factor in the working of many hitherto unprofitable claims in the north side districts bordering on Pritchard creek, a company with sufficient capital having been organized for the purpose of securing an electric plant, which will furnish power to force water up to any desired hight. By this method the banks of pay gravel in the hills high above and surrounding Pritchard creek can be made to yield enormously. The preliminary work of this great enterprise is expected to begin during this fall, and the progress of the undertaking through its various stages will be watched with interest by the mining men of Montana, in many sections of which large areas of placer ground exist that could be mined at an immense profit by such a method as the one referred to.

GOLD BULLION SHIPMENTS.—*Statesman*, Sept. 29: A visit to the United States Assay Office yesterday resulted in the gathering of the following items: The shipments of gold bullion from the local office to the mint in Philadelphia for the months of July, August and September were as follows: July, $39,531.33; August, $48,725.18; September, $35,148.63. While at the Assay Office, the reporter was shown a gold brick from the Kaintuck mine in Lemhi county. The brick, as seen, was in the rather crude condition in which bricks usually leave the melting process at the mine. Its gross weight was 10¼ pounds, with an approximate value of $4100.

MONARCH.—Idaho *World*, Sept. 24: Wm. Oliver, Wm. Kearney and Thos. Barry, Jr., had four tons of ore crushed recently in the Forest King mill from their location—the Monarch—on Summit flat. The ore turned out about $40 per ton, which is over average for gold ore. The ore in the bottom of the shaft is a higher grade than what they had crushed. The ore got poorer as they stoped from the bottom of the shaft up, which is not a bad showing for a mine, as it proves that it improves with depth. With a little more development the Monarch, from present indications, will prove to be a valuable mine.

TEN TONS of Lucky Baldwin ore were crushed in Morrell's mill and Capt. Smart brought over the bullion yesterday. The ore was the second grade and milled between $7 and $8 per ton. The Lucky Baldwin vein is over three feet wide.

LOWER CALIFORNIA.

A MAGNIFICENT SUCCESS.—Alamo *Nugget*, Sept. 20: The International Co.'s new mill started up on the 12th inst. and has been continuously at work since. Every part of the machinery worked to perfection from the beginning and not a halt was necessary to rearrange anything about the mill, as is almost universally the case with all new machinery. But few persons in camp had ever seen a Huntington mill and there were many grave doubts expressed as to its success; but to-day there is not a a doubting Thomas in the community, all joining a general rejoicing over this most important success of the leading company of the camp. In the neighborhood of 15 tons of ore have been crushed each 24 hours, the ore coming from the Princesa, Ulises, Telemaco Cocinero mines, all of which belong to the International Co. The first general cleanup will be made to-morrow, when the results will be known. Amalgam has been taken from the mill and off the plates each day, and will be retorted after the general cleanup. Sufficient amalgam has been taken out to show that the ore is paying very handsomely. The week's run not only demonstrates the success of the mill, but that the company has plenty of pay ore to supply the mill. The ore was not carefully assorted for a special run, but was gathered from the dumps of the several mines, from their accumulations of ore in doing possession work and starting shafts for development purposes. With the present showing the mill will easily produce sufficient revenue to meet the current expenses of the development of the company's mines. In a short time the mines will produce ore enough for one or more addi ional mills. The company and builder are to be congratulated on the result. The Huntington mill cost about one-fourth that of a stamp-mill of the same capacity, and the company's mill proving so decided a success, many others are sure to be built in the camp.

THE EL PASO MILL.—Most of the machinery and timbers of the El Paso quartz-mill are on the ground and the work of grading for the mill-site nearly completed. The preparation of the foundation of the mill, like the mill and all its appurtenances, is of the most substantial and solid kind, and when finished it will be the most complete mill on the peninsula. It reflects credit on its owners and builders, and will add greatly to the permanent improvements of the camp. Work is being steadily pushed on this company's mines developing ore for the mill. They are not sparing either labor or money to make their enterprise a g and success, of which there can be no doubt. It is a matter of regret that Alamo has not half a dozen such enterprising companies to develop her numerous great mines.

MONTANA.

AROUND ARGENTA.—Cor. Montana *Mining Review*, Sept. 28: It is wonderful the new life and activity this camp has taken on since the P. J. Kelly Mining Co. commenced operations here. The Co. now employ 50 men, distributing about $3000 a month in wages alone, and as soon as the Co. start up their smelter, which will be in about ten days, it will employ 125 men. Great praise is due the managers of this enterprise for the push and business-like manner in which the smelter has been rushed on to completion. The P. J. Kelly Co. is here to stay. They have a large property and every day's work in developing the mines gives additional assurance of success. The ore is now running high grade, assaying from $100 to $200 a ton. Last Saturday while drifting in the Anaconda mine, property of this company, a large body of high-grade ore was encountered, running as high as 100 ounces in silver. The ore is a carbonate in formation. The daily production of the mines of this company is about $6000.

ARGENTA DISTRICT.—Butte *Miner*, Sept. 25: Alex. R. Allen, general manager of the P. H. Kelly Placer and Quartz Mining and Reduction Co., reported developments and improvements on the company's ground as progressing rapidly and satisfactorily. The placer claims owned by the company are located at Argenta, about 12 miles from Dillon, and cover about 700 acres of ground. On the quartz claim, Mr. Allen stated, over 1800 feet of open work has been done, the greatest depth as yet attained being 145 feet. A 60-ton smelter is being erected at the mine. The plant will be enlarged by the addition of two more stacks of the same capacity, which will be in operation by early spring. With present amount of development a five-years' supply of over average ore is exposed. The ore runs from 30 to 60 per cent lead, 10 to 40 ounces in silver, and from $4 to $10 gold per ton.

FLOAT.—Recent developments in the Keystone, Oro Fino district, have been so satisfactory that the stock is now being held at 25 cents a share. For the week ending September 15th, Butte shipments of matte amounted to 1,208,944 pounds. This is exclusive of the Anaconda product, amount of which is not known. The Germania is being worked under a lease by McAuliff & Co., who are now sinking and taking out ore which goes $2000 a ton. The shifts of four men are at work in the shaft, and rapid progress is being made. The lessees anticipate a big cleanup on their lease.

NEW MEXICO.

PACIFIC MILL.—Silver City *Enterprise*, Sept. 27: Between 50 and 60 tons of ore is being received at the Pacific mill daily, which will keep the 20 stamps moving most of the time. Eight extra teams were put on hauling ores this week. Nick Rascom has taken a bond and lease on the Pine Dell extension, Juniper mining district. Nick thinks he has a bonanza, and expects to strike the Peerless lead from which ore valued at from $8 to $9 per pound has been taken.

BULLION.—Between $23,000 and $24,000 worth of silver bullion was shipped last week by the Minbres Co. of Georgetown. As long as such shipments are made, Grant county will continue to be the great bullion-producer of the Southwest. C. H. Brenean and Judge Barber spent a portion of the past week here examining the Night Bird property at Pinos Altos. They were much pleased with the property, and will doubtless soon organize a strong company to take hold of it.

AZTEC.—*Southwest Sentinel*, Sept. 24: The Aztec company stockholders are to hold a meeting in St. Louis on the 5th of October, to consider the propriety of mortgaging the company's property for $75,000. What will become of the stockholders when the mortgage is foreclosed—that is, the stockholders who are not on the inside?

THE Mimbres Con. Mining Company of Georgetown shipped 26,624 ozs. fine silver bullion on Friday last; the valuation placed upon it by the company at the time of shipping is $21,000 — the real value, however, is nearly $25,000. This undervaluation saves a little on the cost of transportation.

UTAH.

REVIEW.—Salt Lake *Tribune*, Sept. 28: The week has been a dull one in the local mining world. The handling of ores and bullion has, however, been fair, and the prospects for the fall season are very good. The Hanauer smelter has started up in full blast again. The shipments of the minerals out from this city for the week ending Saturday, Sept. 21st, inclusive, were 2,671,328 lbs. The receipts in this city for the week ending Sept. 25th, inclusive, were to the total value of $111,125.75, of which $51,326.46 was in bullion and $60,799.20 in ore. For the previous week the receipts were to the value of $52,921.26 in bullion and $52,604.58 in ore, a total of $105,526.26. Fine bar receipts in this city for the week were to the value of $19,620; bullion and base bullion, $9656.46. The product of the Hanauer smelter for the week was $15,900 in bullion. The ore receipts in this city for the week were to the value of $25,549.29 by Wells, Fargo & Co., and $35,250 by McCornick & Co. The product of the Ontario for the week was from ore sales, $9719.46; bullion, 17,706 fine ounces; an approximate total of 27,425.46. Fifteen shares of Ontario stock sold in New York, Sept. 18th, at $36, and 19th at $35. The Daly output for the week was from ore sales, $123.60.

PARK CITY.—Cor. Salt Lake *Herald*, Sept. 29: Bullion shipments: Sept. 25th, 15 bars Ontario, 7968 ozs; Sept. 26th, 15 bars Ontario, 8023 ozs; Sept. 27th, 15 bars Daly, 16,283 ozs. Received at Park City sampler for week ending Sept. 27th: 496,200 lbs. of Ontario ore; 338,500 lbs. of Daly ore; 48,950 lbs. of Woodside ore; 87,600 lbs. Mayflower ore; 29,500 lbs. of Apex ore; 9210 lbs. of Crescent jig ore; 28,500 lbs of Union concentrates. The Crescent Co. shipped this week 200,000 lbs. of concentrates and 50,000 lbs. of first-class ore. The Ontario Eastern drain tunnel is in a distance of 2500 feet and the Alliance tunnel is in 1300 feet. Active operations will be commenced at the Glencoe on the 1st prox. and it will not be long before this very promising property will be numbered among the heavy shippers. There is sufficient ore on the dump and in sight to continue shipments for some time. The new hoisting works at the Woodside are completed and under cover. The boiler is in position, and the new engine which arrived to-day will be taken at once to the mine. Another good strike was made at the Comstock this week, the ledge having been again struck in the face of the tunnel, and looking better and richer than any heretofore encountered. The tunnel will be driven about 65 feet farther to make connection with the shaft, when better facilities will be afforded for developing this very promising property.

WASHINGTON TERRITORY.

COAL.—Ellensburg *Capital*, Sept. 28: The coal mines of this county are now producing 1600 tons per day. This is the largest output of any coal district in Washington. Two veins of coal, one five and the other eight feet wide, have been discovered within 12 miles of Ellensburg. These are the largest veins ever discovered in the Northwest.

MECHANICAL PROGRESS.

How to Properly Test Cast Iron.

The following article by J. B. Johnson, director of the testing laboratory at Washington University at St. Louis, we find in the *American Manufacturer*, with a fully illustrated description of the device for properly testing cast iron:

Cast iron is one of the most useful of metals, but one of the most variable in its qualities. Its strength in simple tension varies from 15,000 to 30,000 pounds per square inch, or 100 per cent, while its toughness, or ability to resist a shock or blow, varies by over 600 per cent.

For ordinary foundry purposes cast iron should be soft, to allow easy working under tools; and tough, to resist the effects of shock. It is probable that cast iron breaks nine times from some kind of jar or blow to once from a static load, and hence its ability to resist a shock is many times as important as its ability to resist a dead load.

Now, when cast iron is tested for strength, whether in tension or in cross-breaking, only its ability to resist a quiescent load is determined. Such a test gives no information as to the strength of the iron to resist a shock. It often happens that the strongest iron is the most brittle, or the least able to resist a jar or blow.

Again, when cast iron is tested by the impact test, or by letting a body fall upon it, every blow causes a permanent set or distortion, and so permanently weakens the specimen for resisting other blows, so that when the specimen breaks the test only shows how much strength was left in the body after the previous blows had been given, and not how much was in the material in the first place.

There is, therefore, but one way in which to determine the original resistance of the body to shocks, and that is by testing to rupture with a gradually applied load, either in tension or in cross-breaking, and observing its distortion under this breaking load. This distortion is a simple stretch in case of a tension test, and the deflection in the middle in case of a cross-breaking test. Both methods are competent to determine the absolute resistance of the body to resist a shock.

The resistance to shock depends on both the strength and on the amount of distortion, or "give," the body will take before rupture. A body which will not bend or distort under a load is said to be brittle, and brittleness is weakness when a shock is to be resisted. When two rigid bodies come together at an appreciable velocity, the force of impact is less as the distortion or spring of the materials is greater. If the bodies were absolutely rigid—that is, if they would not distort at all, the force of impact would be infinite so long as the weight and velocity of the bodies were appreciable.

That quality of a material which enables it to resist a shock or blow is called its resilience, or spring. It is not strength, which is measured in pounds, not distortion, which may be measured in inches, but it is the product of both strength and distortion, and is therefore measured in inch-pounds. That is to say, resilience, like work, can only be measured by a unit which includes both distance and force, as inch-pounds or foot-pounds.

A body weighing ten pounds and falling ten feet, or 120 inches, has stored in it ten times 120 or 1200 inch-pounds of energy, or it is then able to do 1200 inch-pounds of work on some other body. If this body should now strike a bar of cast iron, for instance, the iron must be able to develop more than 1200 inch-pounds of resilience, or spring, in order to absorb this energy without breaking.

Now, the resilience of a bar of cast iron in cross-breaking is one-half the product of the breaking load into the final deflection. That is, the load increases from zero to the breaking limit while the deflection is being caused, and the total work done on the bar is the mean or average load, multiplied by the total deflection.

If the load be measured in pounds and the deflection in inches, then the half product is given in inch-pounds.

If the bar be supported at its ends, and broken by a load in the middle, then the whole bar contributes to the deflection, and hence the resilience or resistance to shock of the whole bar is obtained. If we now divide the half product of the breaking load into the final deflection by the weight of the bar in pounds, the result will be the resilience of the material in inch-pounds per pound of iron.

This result is independent of the particular dimensions of the bar, but does depend on its form. For plain rectangular bars, of uniform size from end to end, the result should be the same when the same iron is used. A different result would be obtained for a round bar, but all rectangular bars of the same iron should give the same result, whether flat, square, or broken across in the direction of the greater dimensions.

By this rule no attention need be paid to the dimensions. Take any plain rectangular bar, of any length, and of any cross-section, so long as it is uniform from end to end. Break it by a load on the middle, and measure the breaking load in pounds, and also the deflection in inches. Take half their product and divide by the weight of the bar in pounds. The result will vary from 10 for the most brittle and worthless iron to 70 for the strongest and toughest. A result of 25 will correspond to the lower grades of ordinary foundry product, such as is used in water and gas pipes, while a result of 40 to 50 will correspond to the better grades of machine castings. Stove irons should give a result from 50 to 70.

With this rule, any foundryman could determine the quality of his own mixtures, if he only had a convenient machine for making cross-breaking tests, which would give both the breaking load and the deflection.

Such a device has been designed by the writer of the above, made to operate as an attachment to an ordinary pair of platform scales. It has been so designed because the weighing part of a testing machine is the principal source of expense.

TWISTED CAST IRON.—Rathbone, Sard & Co. of Albany, N. Y., recently produced some specimens of cast iron which manifest unusual properties. The specimens, as described by a New York paper, are pieces of metal about one inch in width, one-eighth inch in thickness, and some 15 or 18 inches in length. Some of these strips have been twisted so as to form spirals. Others have been wrapped upon coils. That cast iron can be made very tough and a certain amount of elasticity imparted to it is known to many of our readers, but it is unusual, to say the least, to find in stove foundries any metal which will bear such tests as here indicated. The twisting and bending is done hot. The company assures us that there is nothing in the metal in these specimens but a judicious admixture of good irons and the absence of old scrap. They make the assertion, further, that it represents their daily melt and that all the Acorn stoves which are being produced have their plates of the same metal that shows these peculiar tests of toughness. All this is undoubtedly of special interest to the trade. It is not to be understood that because the metal will bear a torsional strain of the kind indicated in the engravings it is still unbreakable, for, of course, there is a limit to its elasticity, but that it is stronger than many specimens of cast iron to be found in stove plates it is scarcely necessary to assert after an inspection of the samples which have been submitted.

A NEW COKE-MAKING PROCESS.—Mr. Kingsford of Brighton, England, has just invented a process for making coke while steam is being generated, which has been employed with satisfactory results at various chemical and other manufactories. Two boilers have been made upon this principle to test the working of the process. These boilers are constructed upon what is known as the elephant system, except that they have three bottom tubes similar to those of the Cornish boiler—that is, with an internal flue running the entire length, and provided with suitable openings for the admission of the gases into them. The ovens have openings in convenient positions, and through these the gases pass into the internal flues and are delivered into the lower of two chambers. They return under the lower shells to the opposite end of the boiler, and are thus delivered into the upper chamber, finally passing away into the chimney or uptake. These two boilers generate from 5000 pounds to 6000 pounds of steam per hour. The coal used for the purpose is small and suitable for coke-making. It can be cheaply purchased. It is stated that the product of this system—the coke—is worth as much as, if not more than, the coal at first employed. Thus the adoption of the principle is declared to secure the production of steam absolutely free of cost.

THE LATEST IN HORSESHOE MANUFACTURE.—The rolling-mill of the Chicago Horseshoe Co. located at East Chicago, Ind., has a 12 inch train of rolls, driven by an engine built by the Taylor Manufacturing Company of Chambersburg, Pa. The rolls are so arranged that the horseshoe bar is led from the final pass between two large vertical rolls. In the periphery of the upper roll are arranged at proper distances a series of teeth and projecting ridges which punch the bar for nail holes and also crease it. The bar then passes directly to the horseshoe machine to be shaped. On entering the machine the bar is pressed into the requisite curved form by a number of direct acting plungers operated by cams or eccentrics, and at the same time the heels are formed by another set of plungers. Saws placed below cut the shoes apart. This machine is so constructed that more shapers and saws can be added to operate on longer bars whenever an enlargement is deemed necessary, thus greatly adding to the capacity of the machine. The equipment of the works also includes a number of separate punching and shaping machines for turning out the Goodenough shoe which the company propose to manufacture. The works will probably be started within a few days.

DEFECTS IN THE WIRE NAIL.—The wire nail has now been long enough in the market to demonstrate some of its defects. It is found by experience that the head, which is flat, rusts off after about two years' exposure, thus rendering it entirely unfit for shingling or any other work which requires that the nail shall be exposed to the weather. This serious fault, together with the inferior holding power of the wire nail as compared with the cut nail, which has been demonstrated by the Government tests, make it an object of suspicion, and will materially limit the list of good traits that the manufacturers claim for it.—*Ohio Valley Manufacturer.*

SCIENTIFIC PROGRESS.

Is the Formation of Steam a Physical or Chemical Change?

Noah Webster, in his "Unabridged," defines "steam" as being "The elastic, aeriform fluid into which water is converted, when heated to the boiling point; water in the gaseous state." And that is about as good and concise a definition of the article in question as one could find in a day's search.

But the particular point is as to whether the steam is only water vaporized, or whether it has been converted into something else by the action of heat. In other words, is the formation of steam caused by a physical change or by a chemical one in the water? By a physical change is meant one which does not affect the molecules of the body acted upon, and does not take away or add any properties of which it may have been possessed.

A chemical change, on the other hand, is one in which the molecules are pulled apart and resolved into their original elements, or combined with something else so as to form a new compound.

A familiar example, as given in elementary books on chemistry, of a physical change consists in the pounding of a lump of sugar into a fine powder. Its form is changed, but it still remains sugar. Pour some sulphuric acid on the same sugar, and in a very short time it has been converted into carbon in consequence of the affinity which the acid always manifests for moisture—each molecule of the sugar having in its composition 22 atoms of hydrogen and 11 of oxygen. A chemical change has been effected.

Now I have tried hard to settle in my own mind as to whether the formation of steam is a chemical or physical change in the water. According to the rules, so far as they go, it is only a physical change both as to the pounding of sugar into powder and the vaporization of water by the application of heat. But suppose you continue the pounding of the sugar until sufficient warmth is evolved to cause combustion, and the heating of the water is continued until the molecules of steam are separated into their original atoms of hydrogen and oxygen.

What do you call it then? Therefore I ask if there is not good reason for advancing the idea that the formation of steam is simply a preliminary stage in a chemical change of the water?—*Power Steam.*

Loss of Light Through Windows.

Some interesting experiments have been undertaken by Herr Herzberg, with the co-operation of Herr G. Schulze, chief engineer of the Berlin works of Messrs. Frederick Siemens & Co., for the purpose of ascertaining the loss of light in passing through window glass of various kinds in general use. The experiments were conducted with a Bunsen photometer, in which two Argand gas-burners of equal illuminating power were placed at the two ends of the graduated bar. After equality of illumination of the screen had been established, a plate of the glass to be tested was interposed between one of the end lights and the screen, and the extent of the displacement of the latter thus necessitated for the re-establishment of equality of illumination on both sides gave the measure of the opacity of the glass. A simple translucent, but not transparent, glass showed a loss of 27 per cent of light. Cathedral glass, such as is used in stained-glass work as a basis, being clear but with a slight ground tint, showed a loss of 12⅝ per cent. Plain cathedral glass, with a white tint, also showed a loss of 12⅝ per cent. Plain white Rhenish "double glass" gave a loss of 10 per cent. Plain thin mirror glass obstructed 10 per cent of light. The two last, together with an interval of six centimeters between them, showed a loss of 21 per cent. Cathedral and Rhenish "double glass," together with the same interval, showed a loss of 23 per cent. A ground glass with cut stars, together with a white background, such as is found in house fan lights, obstructed 60 per cent of light. A new, clean piece of ground glass without stars, together with the dusty white glass background, as in the preceding experiment, showed a loss of 40 per cent.

THE CREATION OR DIFFUSION OF FOGS BY CONCUSSION.—A novel proposal for the dispersion of fogs has been made by a Swiss artillery officer, who has placed upon record his opinion that a phenomenon of this kind recently occurring under his observation was due to a discharge of some pieces of ordnance. This statement has been circulated in France and has elicited communications upon the atmospheric effects of artillery fire, leading to quite a different conclusion. It has been stated, for instance, that during the siege of Belfort, in the Franco-Prussian war, where an average of 1000 discharges of cannon per hour was registered for many days in succession, firing was frequently suspended on both sides, owing to the dense fogs which settled down upon the field of action. This observation would give ground for the supposition that concussions of the air near the surface of the soil, by interfering with the circulation of air bring about that congested condition of the atmosphere which is a necessary condition for the production of fogs. This conclusion leads further to the idea that not only the aggregation of houses in towns, preventing the passage of light breezes, determines the production of fogs in such localities, but also that the concussion of air due to the shocks of town traffic may operate in the same way. Further observations are desirable in regard to this matter; but now that the nature and causes of town fogs are so carefully studied with a view to their prevention and cure, it is desirable that every contribution to the elucidation of the subject, however apparently insignificant, should receive its due meed of attention, because if not conclusive in itself, it may possibly contain the hint of something that it would be misleading to overlook.

PHOTOGRAPHS BY TELEGRAM.—If some newspaper correspondent is not gulling the people by writing from New York to the Boston *Herald*, a chemist, electrical expert and inventor, living in New York, has originated a method of taking pictures of passing events by instantaneous photography, and then transmitting them by telegraph, to be reproduced in the columns of a distant journal within six or eight hours after the event occurs. The machine runs by clockwork and electricity. The newspaper reporter thus becomes his own photographer, telegrapher and artist. A patent was taken out some years ago through the patent office connected with this journal, by a citizen of San Francisco, for a device by which an entire newspaper page, with any number of engravings, could be transmitted by telegraph in a few minutes. There seems to be no limit to the wonderful power of electricity as connected with the telegraph. The latest effort in this direction is referred to in *Popular Science News*, as follows: M. Leon Esquine, a Mexican, it is stated, has perfected a marvelous invention in electricity and photography. By speaking in a photophone transmitter, which consists of a highly polished diaphragm reflecting a ray of light, this ray of light is set into vibrations, and a photograph is made of it on a traveling band of sensitized paper. Now comes the wonderful part. If the image of this photographic tracing is projected by means of an electric arc or oxynydrogen light upon a selenium receiver, the original speech is then heard. It is evident that there is no limit to the development of this peculiar combination of methods. This is very important, if true.

ELECTRICITY IN POWDER-MILLS.—The German technical journals have recently published some instructions as to the precautions which ought to be observed in powder-mills to prevent explosions attributable to electricity. In a large powder-mill in Germany an explosion lately occurred in the press-room. A workman engaged in pressing powder into cakes between sheets of ebonite, left his work during a thunder-storm. When the storm was over he loosened the press, and, on putting out his hand to remove the powder, a spark four inches long went through his body, igniting the powder and killing the man. The employment of insulating substances, such as gutta percha, ebonite, etc., is therefore considered as liable to lead to accidents. In one of the principal powder-mills of Germany the sulphur crushing machines are all put to earth, and since this precaution has been taken there has been no trouble from the mysterious explosions which had previously proven so troublesome.

HOW MOUNTAINS ARE MEASURED.—The hights of mountains are now ascertained by two methods—trigonometry and the barometer. The latter method, of late years, has supplanted the former, except where the mountains are inaccessible. Barometrical measurement was discovered by Pascal, the mathematician, in his experiments. He found that the hight of the mercury in the tube varied at different hights above the level of the sea, because of the difference in the pressure of the atmosphere. He judged from this that the indication of the barometer might be used to ascertain the hights of different elevations. The perfection now obtained in the construction of barometers, and skill applied to their use in observations, renders it possible to have elevations calculated with the greatest accuracy. These observations are conducted with much carefulness, two good barometers being generally used, the one at the lower and the other at the upper point of observation.

NOT AMERICAN BUTTERFLIES.—Edward Everett Hale says: "I was brought up to consider Charles I a saint and a martyr, and Oliver Cromwell a fanatic and a murderer, simply because the people who wrote the books which I read as a child, chose to think so, and lived in England. Why, as lately as when Agassiz first came to this country, he went into a Cambridge printing office, where they were printing a book of natural history. They showed him the sheets with some pride, and Agassiz said: 'Yes, I see. An American school-book with pictures of three butterflies, and not one of the butterflies was ever in America! That is the way to bring up children in a colony.'"—*Chicago Journal.*

DELTA METAL, which is prepared for market in ingots, plates, sheets, rods, wire, etc., is properly an alloy—an improved quality of brass—as hard, durable, and strong as mild steel, and of a beautiful golden color. When melted it produces sound castings of fine grain; can be forged and rolled hot and cold, and takes a very high polish. It is being largely used in London and elsewhere for all kinds of machinery, and for house, door, and other fittings.

GOOD HEALTH.

Stimulants and the Voice.

Tobacco, alcohol and fiery condiments of all kinds, says the *Contemporary Review*, are best avoided by those who have to speak much, or at least they should be used in strict moderation. Like tippling, the effect of cigarette-smoking is cumulative, and the slight but constant absorption of tobacco juice and smoke make the practice far more noxious in the long run than any other form of smoking. Our forefathers, who used regularly to end their evenings under the table, seemed to have suffered little from the well-known effects of alcohol on the nerves, while the modern tippler, who is never intoxicated, is a being whose whole nervous system may be said to be in a state of chronic inflammation. In like manner cigarette-smokers (those at least who inhale the smoke, and do not merely puff it "from the lips outward," Carlyle would say) are often in a state of chronic narcotic poisoning.

The old jest about the slowness of the poison may seem applicable here; but though the process may be slow, there can be little doubt that it is sure. Even if it does not kill the body, it too often kills or greatly impairs the victim's working efficiency or usefulness in life. The local effects of cigarettes in the mouth must also be taken into account by those whose work lies in the direction of public speech. The white spots on the tongue and inside of the cheeks known as "smokers' patches" are believed by some doctors with special experience to be more common in devotees of the cigarettes than in other smokers; this unhealthy condition of the mouth may not only make speaking troublesome, or even painful, but it is now proved to be a predisposing cause of cancer.

All fiery or pungent foods, condiments or drinks tend to cause congestion of the throat, and if this condition becomes chronic, it may lead to impairment, if not complete loss, of voice. The supposed miraculous virtues of the mysterious possets and draughts on which some orators pin their faith exist mainly in the imagination of those who use them; at best they do nothing more than lubricate the joints of the vocal machine so as to make it work more smoothly.

THE VALUE OF SINGING.—A recent writer in the Boston *Herald* advocates the practice of teaching singing as a means of preventing consumption. As Dr. Busey aptly says, if an hour a day were devoted to it in our public schools, there would not be the sad spectacle of the drooping, withered, hollow-chested, round-shouldered children. Vocal music is gymnastic exercise of the lungs by development of the lung tissue itself. The lungs in improved breeds of cattle, which naturally take little exercise and are housed much of the time, are considerably reduced in size when compared with those animals running at liberty. And so it is with the human race who lead inactive lives caused by civilization. Consumption generally begins at the tops of the lungs, because these parts are more inactive, and because the bronchial tubes are so arranged that they carry the inspired air with greater facility to the bases than to the tops. During inactivity a person will ordinarily breathe about 480 inches of air per minute. If he will walk at the rate of six miles an hour, he will breathe 3260 cubic inches. In singing this increases more than in walking, as to sing will require all the capacity of the lungs. Besides vocal-music exercise, there are wind instruments which all with hollow chests can use with infinite advantage. Give a young person a cornet, a clarionet or some such instrument, and by the time he has learned to play upon the same his deformity will have entirely disappeared.

SAVED BY HER STOCKINGS.—Her thick woolen stockings saved the life of Mrs. Burton of Middlebury, Pa. She was bitten by a rattlesnake, but the stockings absorbed the venom. The spot turned bright green. The writer of this paragraph, like all civilized specimens of the human race, once wore petticoats. While thus clad he was taken from his feet by a mad hog and received a violent shaking as if by a dog. When rescued, the skin had been broken by the action of the hog's teeth and blood was flowing from the wound. The virus was no doubt kept from the system by the garment in which he was clad, otherwise he might never have lived over 70 years since to write this paragraph.

WHAT IT IS THAT PULLS A PERSON DOWN — "It is not intellectual work that injures the brain," says the London *Hospital*, "but emotional excitement. Most men can stand the severest thought and study of which their brains are capable, and be none the worse for it, for neither thought nor study interferes with the recuperative influence of sleep. It is ambition, anxiety and disappointment, the hopes and fears, the loves and hates, of our lives, that wear out our nervous system and endanger the balance of the brain."

COMMON CAUSE OF DYSPEPSIA.—One of the most common causes of dyspepsia is eating heartily when the system is tired and jaded. When exhausted by either mental or physical work, we are usually ravenously hungry, and, of course, turn to food as the means of restoration. The fact is seldom appreciated that the stomach shares in the depression caused by overwork, and hence at such times is unable to perform its ordinary duty. The food taken then is but very slowly digested, and before the process is completed fermentation often takes place. If it does, the consequence is that we are in a worse state than if the food had not been taken, for the fermentation generates acids and gas, which in turn not only interfere with digestion, but excite other disturbances. In a very strong and healthy person the ill effects of eating when the system is much fatigued would not be so marked as in one below the standard of health. Very nervous individuals suffer from the habit, and if debilitated, they are quite sure to grow more so if it is persisted in. When very "tired and hungry," it is always best to rest for a time before eating, or to take some such simple "pick-up" as hot milk, which should be slowly sipped. That is very refreshing indeed, and usually meets the requirements quite as well as an alcoholic stimulant.

TO PREVENT RHEUMATISM.—We have entered the season when rheumatism is likely to be the most prevalent. After several months of warm weather, the systems of those who have not been fortunate enough to evade the heat, in shady places at summer resorts, are relaxed, weakened, and more or less choked up with waste, says the Boston *Herald*. Exercise, the great eliminator of waste material, is quite naturally neglected during the hot weather. And, what is equally unfortunate, those who exercise too little are sure to eat too much. So autumn finds them in a sluggish state, as we have said, with all the waste avenues more or less clogged up. That is a condition of things very favorable to rheumatism. Those who have a tendency to that disease should "take a stitch" now and free their systems from all injurious retained matter. They should live abstemiously, exercise freely, keep the skin active by frequent bathing, the bowels open with fruits, and drink water in large quantities. Water dissolves and washes waste matter out of the system; it is therefore an absolute essential where there is any impairment in the action of the kidneys, bowels or skin. He who applies this simple treatment, and takes proper care of himself otherwise, may feel quite secure from attacks of rheumatism.

A SIMPLE EXPERIMENT which will show how injurious is cigarette smoke inhaled may be easily performed by means of a handkerchief. After taking a mouthful of smoke, put the handkerchief tightly over the lips and blow the smoke through it. You will find a dark-brown stain on it. If the smoke is inhaled, and then blown through the handkerchief, there is very little stain, if any; consequently all that nicotine must remain in the lungs.

A GREAT CITY OF THE DEAD.—The total number of bodies registered as buried in cemeteries used by London is 1,276,875.

USEFUL INFORMATION.

HOW TO WASH MILK CANS.—In washing out milk-cans and pans, where there are quite a number of them, it is the general custom with many to pour boiling hot water into a few, allow it to stand there for several minutes, and then pour it into others and so on—one supply of hot water made to suffice for the cleaning of all. It naturally follows that the water soon loses much of its heat, and those vessels in which it is used last are very indifferently treated, and cold water would have been quite as serviceable in some respects. Whatever is used to hold milk should be boiled before it is called into service. Warm water may be sufficient for the removal of dirt, but neither that nor even boiling water used as described will clean cans, etc., as they ought to be cleaned. Milk is notorious for its absorbent powers, taking up bad odors and the germs that float in the air. It is also one of the best mediums known for the growth of such germs. Boiling water will kill such germs, if they remain in it long enough, but a hasty contact is never sufficient to destroy them or their spores—or seeds—which latter are very hard to kill. To clean milk vessels properly they must be filled with water and then be put in a hot oven or on the top of a hot stove to boil. And if boiled well for a few moments they are made safe; that is the only domestic way of making them so. One observer recommends the use of sal soda in washing milk vessels because it acts chemically upon fatty matters—grease—and thus helps to remove them and other materials which adhere to the vessels with them. In like manner the use of live steam to dry vessels after washing has the advantage of sterilizing them, *i. e.*, killing the bacteria by the highly heated steam.—*Boston Herald.*

SOME OF THE GOOD AND BAD USES THE POTATO IS PUT TO.—Science, says the *Mechanical News*, is constantly finding new uses for familiar substances and products. The humble potato has been thus elevated to a position of increased importance, quite beyond what is customarily ascribed to it. For instance, saying nothing of the numerous forms in which it is made serviceable in the culinary art, a recent writer mentions that in Germany spirits are made from it and exported under the name of "Stettin brandy;" that a good deal of French cognac has no real origin in the grape, but is, in fact, spirits of potato; that eau de cologne is extensively made from the same useful tuber; that after the farina has been extracted, the potato pulp is made into picture frames, boxes and toys; and finally, that the water expressed in the process is found to be a valuable scouring fluid. The man who makes two blades of grass grow where but one grew before has been accepted as the typical human benefactor; but he should rank no higher than the genius who makes one potato more useful to mankind than a half dozen were before his advent.

THE INMAN STEAMSHIP LINE.—It is quite well known that, notwithstanding foreign flags fly over most of the deep-sea vessels in the harbors of the United States, there is nevertheless much American capital invested in such vessels. There are several vessels with a foreign flag and foreign register which are constantly sailing to and from San Francisco and various foreign ports, which are, nevertheless, owned to a greater or less extent by San Francisco capitalists. The same is no doubt true of most of our large seaboard ports. Even the most extensive steamship line in the world—the famous Inman line of New York and Liverpool—is nearly altogether owned by American capitalists. An Eastern paper says: A majority of the stock in the Inman steamship line, to which the City of Paris belongs, is said to be owned by Americans. Andrew Carnegie is reported to be a large owner, and the late Mr. Thaw of Pittsburg was said to hold stock valued at $1,000,000. The editor of the Chicago *Tribune*, Mr. Medill, who was a passenger on the City of Paris on her recent fast trip, is reported to have explained that the ship and the results attained by it were due to American enterprise backed by American capital. He knew that the application of American inventions to the machinery of the steamship had increased her speed one knot an hour, and that *nine-tenths of the capital* of the Inman line was American money. A State Senator of New Jersey, Mr. Warwick, confirmed what Mr. Medill said of her ownership.

THE RECORD OF A STREET-CAR CABLE.—The following record of a street-car cable that recently wore out its life doing duty on the California-street road will be read with interest. It was first published in the *Pacific Lumberman:* The diameter of the cable when laid was one inch and a quarter, but 20 months of constant hauling and wear over the pulleys and through the grip thinned it down one-eighth of an inch. Its length was 17,513 feet, and its weight, 44,604 pounds. For nineteen hours a day it kept moving every day for 20 months, and as its speed was seven miles an hour, the distance it traveled was 79,800 miles. It transported about 6,000,000 passengers, or about six times the population of the State, and turned over to the company $300,000 worth of nickels, being at the rate of $15,000 a month, or $500 a day. As the total power of the road was 400-horse power, it may be calculated this rope was doing as much hauling while in motion as 200 horses, and as each car hauled by horses uses four teams a day, the daily work of this cable was equal to that of 800 horses, with a deduction, however, for the great power required to move 44,604 pounds of cable. The cable was composed of six strands of steel wire cables, each one containing 19 wires varying in size from six to eight wire gauge, and twisted around a stout hempen core five-eighths of an inch in diameter.

CENTERS OF POPULATION.—Within a circle whose radius is 500 miles around Chicago there are 21,914,947 persons, and 54,801 miles of railroad. A circle of the same radius around New York City embraces only 19,941,602 persons and 30,369 miles of railroad. A 500-mile circle around St. Louis embraces a population of 23,714,000, and reaches within a few miles of New Orleans. This fact of a larger population within easy reaching distance forms one of the claims which St. Louis puts forth as the proper place for holding the proposed international exposition of 1892. It will be observed that the 500-mile circle around New York contains the smallest aggregate of population of the three cities named, but neither of the others presents such facilities of communication with other nations, which forms a most important factor in fitness of locality for an international exposition.

A WOMAN MACHINIST.—A Belfast, Me., lady, who believes that woman is capable of performing much labor that is now exclusively done by men, has entered a machine-shop in that city, and is learning the machinist's trade. The proprietor says she takes hold of the work as readily as any apprentice he ever had, and does her work in a remarkable manner. With an apron covering her dress, she stands up to the lathe and does her work as though she enjoyed it.

A NEW DECORATIVE PROCESS.—The old process of decorating china is likely to be revolutionized by a discovery made by J. B. Bonnaud, a Frenchman. By his method it is possible to obtain in a few minutes the same artistic effects which cost the hand painter on china days of labor. Landscapes, groups of figures, and portraits are produced by this means on vases, plates and plaques, in their natural colors, even to the most delicate shades.

ENGINEERING NOTES.

THE RENAISSANCE OF THE CANAL.—We have heard a good deal lately about the abandonment of canals on account of the greater cheapness of railroad transportation, especially in the United States. No wonder our canals are being abandoned, for, such as they are, with their miserable towpaths, small cross-section, unstable banks and mule motive-power, they are relics of the days of the stage-coach, and it is high time they gave place to something modern. There will be a reaction here, as well as in England, some day in favor of canals, but they will be ship canals, with steam for motive-power, and capable of floating the largest vessels. The Nicaragua canal is the first one we need, to give us cheap transportation between the Atlantic and the Pacific. If the British and Canadian Governments can afford to spend hundreds of millions of dollars in building the Canadian Pacific railroad, in establishing docks at Esquimault, and in subsidizing steamships from Vancouver to China and Australia, what should not we be able and willing to do to tie together by water our eastern and western sea coast? The Erie canal has been one of the greatest causes of the prosperity of New York City and State. It is capable of doing yet more for both, and the most far-sighted and liberal policy should be adopted in regard to its enlargement. After the Erie and Nicaragua canals may come the Florida and the Cape Cod ship canals, on our coast; the James river and Kanawha canal, to connect the Ohio river with the Atlantic ocean; the Hennepin canal, to connect the lakes with the Mississippi, and the proposed canal between Lake Erie and Pittsburg, to connect the lakes with the Ohio. If it pays England to put a ship canal between Liverpool and Manchester, what would it not pay us to build these more important canals in America?—*Engineering and Mining Journal.*

A TUNNEL A CENTURY IN ITS CONSTRUCTION. An engineering work that has been a century in course of construction forms one of the most notable landmarks of engineering history. Its construction may also be said to be a fair exposition of the progress of that class of engineering during the past century. This tunnel has been but recently completed and is referred to by the Glasgow *Engineer* as follows: The tunnel, or adit, is at Schemnitz, in Hungary, its construction being agreed upon in 1782, with the object of carrying off the waters from the Schemnitz mines to the lower part of the Gran valley. The work, which is now complete, forms the longest tunnel in the world, being some 10¾ miles long, or about one mile longer than the St. Gothard tunnel, and 2½ miles longer than that of Mount Cenis; the hight is 9 feet 3 inches, and the breadth 5 feet 3 inches. This tunnel, which has taken so long a period to bring to a completion, has involved an expenditure of about £1,000,000, but the saving to those interested, in being able to dispense with water-raising appliances, amounts to a large sum annually. A fact of no little interest in carrying out this project is that, though the latter generation had greatly the advantage in the matter of machinery for accomplishing such work, the cost of labor was greatly in the former's favor. The original contract was for the completion of the tunnel in 30 years, at a cost of £7 per yard run, and for 11 years the construction was carried on at that price. Public events, however, interfered with the progress of the work, as well as enhanced the cost of labor and materials, the cost per yard eventually exceeding £20.

THE GREAT BEAR RIVER CANAL, in Utah, for the construction of which $2,000,000 has been provided, is expected to be one of the most extensive irrigation works in America. To get the river along the side hill along Bear river canyon and out on to the plain near Plymouth will necessitate moving 220,000 cubic yards of solid rock, 19,000 yards of loose rock, 1,528,000 cubic yards of earth, and digging 1200 feet of tunnel. This canal will irrigate 200,000 acres in Salt Lake valley, and 6,000,000 on Bear river, increasing the value of the land to $50 per acre, while fencing, building and tillage are expected to double this valuation in a few years. Bear lake is in Southeastern Idaho. The reservoir for this canal covers 150 square miles, and the canal will secure the irrigation of a territory extending to Ogden.

RAILROADS IN CHINA.—China is starting apparently on an area of extensive railroad construction. Bids have been received by the Government for constructing the first section of a railway from Peking to Chinkiang, which means a very large expenditure both for construction and equipment.

THE GIGANTIC PROJECT in France for connecting the Mediterranean with the Atlantic ocean by a grand ship canal through the center of that country, seems to be taking shape more surely than ever since the failure of the Panama canal. The French people are irrepressible.

THE VOLUME OF NIAGARA.—The volume of water pouring over Niagara Falls at an average stage of the water is estimated in weight at about 563,000 tons per minute. In comparison the amount of water in the recent flood at Johnstown was but a pint cupful.

MINING AND SCIENTIFIC PRESS.

A. T. DEWEY. W. B. EWER.

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W. B. EWER.....SENIOR EDITOR

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SAN FRANCISCO:

Saturday, October 5, 1889.

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Passing Events.

From all over the coast there are complaints of the dryness. Streams have failed more or less all over the Pacific Slope. A great many quartz-mills have had to close down or hang up some of their stamps. The river-bed miners, however, are having a good season for their branch of the industry.

The announcement that the Big Bend tunnel enterprise is a failure by reason of the cost of removing boulders from the bed of the river is not credited either in Butte county or here. It is stated that 20 men have been clearing $7.50 per day to the man for the company, working in a very inexpensive manner. The enterprise has hardly been given a fair trial thus far, notwithstanding the sensational dispatches sent from the East.

There is some trouble in this city with the molders in the foundries, but the foundrymen are adverse to making any concessions to the men and will stand together in the matter of resisting any unreasonable demands.

There have been some fears concerning the miners who are wintering on Forty-Mile creek, Yukon river, Alaska, but J. G. Davis, who has recently come from there, says the men are comfortably housed and have plenty of provisions to last all winter.

The Water Dispute on the Carson River.

Our Virginia City, Nevada, exchanges are devoting considerable attention to the dispute over the water question now going on between the farmers on Carson river and the owners of mills on the same river. At this distance from the field of dispute it looks very much like the farmers stand in their own light when they attempt to control the waters of the river to the detriment of mill-owners. The farming community is dependent upon the mining industry, for without the latter there would be no profitable market for the farm product, and therefore farming lands on that river would be uncultivated. The millmen, through Hon. Francis G. Newlands, in a commendable spirit, have offered a compromise that will do away with all future disputes and give all in interest an ample supply of water the year round. The compromise offered is for the mill-owners and the farmers to each contribute so much money for the building of reservoirs for the storing of water for use during the dry season. This is a fair and just proposition. It goes without saying that with ample water-power not only all the mills now built could be run, but others could be built and run the entire year. The dropping of all the stamps would give profitable work to a larger force of men in the mills and mines, and the more given employment the more products of the farm will be consumed.

The farmers should not look at the subject from a one-sided selfish standpoint, and they must concede that the millmen's action is dictated by a spirit of conservatism grounded on the broad plan of the greatest good to the greatest number. They must also recognize the fact that the millmen are not overanxious to kill the goose that lays the golden eggs, which is better illustrated in their recently reducing the mill charges $1 a ton. This reduction in mill charges is without doubt very important to the mining industry at Virginia City, for it will admit of large quantities of low-grade ore being worked, which means the giving of employment to larger forces of men. This spirit of enterprise, looking to the more profitable working of the mines, should be met by the farmers in aiding by all means in their power the securing to the millmen throughout the year all the water-power possible through the building of reservoirs. In doing this they place the mining industry, upon which they are dependent, upon a surer and more stable footing.

Annual Assessment Work.

The bill introduced into Congress by Senator Stewart of Nevada, changing the date for the annual assessment work on unpatented mining claims, did not become a law. But at the same time there is no law which compels the miner to put off that work until the 1st of January. If the work is done now it will save considerable trouble and inconvenience. It is foolish to wait until December when the snow is on the ground in the mountainous regions. A great deal more can be accomplished now for the same expenditure of labor and money. Frozen ground is not much easier to work than rock.

The men who intend to hold their claims must do this work within the year, according to law. It was a necessity to fix some stated period and date; but the work can be done at any time in the year before that date. There is nothing at all gained by waiting until the last moment, but on the contrary there is less accomplished, and more discomfort, in waiting until the dead of winter.

Of course, many miners only do this work because the law requires it, but they should remember there is a gain to them in performing it, since it leads to a certain amount of development on the claim. Every year when this annual expenditure work is going on we hear of strikes in claims. Any man may have this same luck. If the law provided that the work must be done by October, it would be done; there is no reason for not doing it in that month, law or no law. It will only be a short time now before the snow flies on the mountains, and those who take time by the forelock can have the laugh on their procrastinating brethren of the pick.

THE Rae process of amalgamating ore pulp has been introduced in the Occidental mill.

That Big Gold Bar.

Our friends of the *Montana Mining Review* accuse the "mining papers of California" of seeking to belittle the big gold bar sent East by Col. Broadwater by alluding to it as worth about $100,000. The *Review* says: "The facts in the case are that Montana's gold bar, the product of only three mines for one month's run, and which was worth exactly $101,385.50, is the largest gold bar ever cast of which there is any authentic history. It is but natural, of course, that California should feel jealous of the stripling Montana, used as she is to being lovingly alluded to as the 'Golden State.'"

The PRESS is probably alluded to, since we gave the approximate value and dimensions of the Montana bar, but also gave the exact value and dimensions of a gold bar cast in California some years since, the latter being the larger.

The *Review* is mistaken in its claim that the Montana bar was the largest ever cast "of which there is any authentic history."

The writer of these paragraphs was one of many persons in San Francisco who saw the big bar which was made from gold of the North Bloomfield mine. Its weight was 511½ pounds troy. The length was 15 inches, width 6 inches, and depth 7 inches. It contained 630 cubic inches of gold, worth about $19 an ounce, the total value being $114,000—the largest bar ever made.

As according to the *Review's* own account the Montana bar was worth $101,385.50, it cannot be called the biggest one ever cast, when we have "authentic history" and personal observation of one made here worth $114,000. Moreover, the California bar was made from the product of one run of one hydraulic mine, while the Montana bar was the result of the product of three mines.

There was no attempt by the California mining papers to belittle the Montana bar. Attention was simply called to the fact that its claims of being the biggest bar ever cast were incorrect. On the strength of this mistake this same paper heads one of its articles, "Montana, the Golden State." Yet the statistics of production of precious metals show California a long way in the lead still as a gold producer, both annual and total. For instance, California produced in gold alone last year $12,750,000, while Montana produced at the same time $4,200,000 in gold. It is true, Montana exceeded in total production of precious metals, but was way behind California in gold, as the figures show. The statistics were taken from the report of the director of the United States Mint, those for California having been prepared by Israel Lawton of the United States Mint at San Francisco, and those for Montana by Spruille Braden in charge of the United States Assay Office at Helena.

While Montana comes next to California in the annual product of gold, it does not yet come up to one-half the product of California.

The State of California has produced since its mines were discovered, up to the end of 1888, according to the U. S. Mint statistics, a total sum of $1,221,260,550 in gold alone. When some other State or Territory can come up to that "billion" mark, not counting the couple of hundred millions beyond, it can take from us the title of "The Golden State." Thus far none of them have come anywhere near it, not even Nevada, whose total product comes next to that of California.

Montana is showing a most magnificent product of precious metals, and is leading all her sister States and Territories at present, just as California once led, then Nevada, and then Colorado. It was only last year that Montana took first place. But there is something doing in mining outside her borders. There is no need of any misrepresentation for her to hold her proud position. She neither made the biggest gold bar, the biggest annual gold production, nor the biggest aggregate gold production. These honors belong to California. Montana has honors enough of her own in precious metal mining without need of claiming those that do not belong to her. Let her strive to hold first place as many consecutive years as California did, which will be quite a little undertaking.

ANOTHER effort is being made by Pioneers and Native Sons of the Golden West to purchase and preserve what is left of Sutter's Fort. The fort and land surrounding it belong to Benjamin Merrill of Chicago.

Mines on Railroad Grants.

A decision has recently been made by the U. S. Supreme Court in the matter of the application of two Montana mining companies for patents, which is calculated to excite some alarm among prospectors and miners. By the decision referred to the adverse claims of the Northern Pacific Railroad Company filed against the applications for patents made by the mining companies are successfully maintained. Of course, acting as a precedent, the decision will bar all other applications for patents to mineral lands within any of the sections of land included in the grants made the railroad company by the United States. Under the decision, title to every unpatented claim located along the main line of the Northern Pacific railroad is seriously affected, and the only relief obtainable is through congressional action.

In this State also, as well as in some others, this question of mineral or railroad lands is going to create trouble. Only this week there is an instance which came up before the Register and Receiver of the Land Office at Sacramento. The land in controversy was on the Georgetown divide, El Dorado county, and embraced 32,860 acres which was originally returned by the Surveyor-General as mineral land. The Central Pacific Railroad Co. subsequently listed the land, but the Government refused to issue patents for it, basing its refusal on the return of the Surveyor-General. The late contest was to decide whether the land was mineral or agricultural in character.

A large number of witnesses were examined, but there was no evidence produced that the land was mineral in character, except 2860 acres, which the railroad company relinquished. The other 30,000 acres were decided to be agricultural lands, and if the Commissioner of the General Land Office affirms the decision of the local land office, as he undoubtedly will, the railroad will receive a patent for the disputed land.

Little by little the area available for the prospector is being narrowed, and by and by most of the mining ground will be within agricultural boundaries or those of a railroad grant.

Cable-Road Patents.

The American Cable Co. of New York has commenced suits against the cable railroad companies of this city, claiming that under the Thompson patents the roads here are infringers. They claim that the Thompson patent covers the general principles of cable roads as well as tube, slot, grip, cars, etc. There are some hundreds of separate patents in cable-road appliances, most of which belong to the Pacific Cable Co. by purchase. The Abel Thompson patent was issued Oct. 1, 1872, just 17 years before suits for infringement were commenced. It was never tried, and its term of existence has expired. In effect, Thompson's idea was to run a locomotive in a subway or tunnel connecting it with a car on the street above, by a bar or chain, through a suitable slot.

This has never been done and probably never will be. The idea of running an endless cable in tubes or tunnels is entirely different in every way. Thompson's "claims" in his patents are as follows:

First—The tunnel below the railway track and street provided with rails for an independent locomotive engine and a longitudinal opening through the top of the tunnel for the connection that comes from the locomotive to the car.

Second—A tunnel made of transverse trusses open at the upper portion and connected by longitudinal bars, etc.

The first of these claims covers the idea of moving the cars by a moving locomotive, while cable cars are propelled by a stationary engine through the medium of an endless cable. The second claim, however, is more to the point, for it covers the general features of the tubes or subways in use on all cable roads. It is this claim which forms the basis of the suits. While it does not mention yokes, such as are used, the construction is in effect a yoke. Such construction may have been used before, however, for conduits, sewers, etc. The cable companies will have to prove either that Thompson's invention was anticipated or that they do not infringe the patent.

THE prospectors who have been in the mining fields of the islands adjacent to New Guinea have returned with discouraging reports.

Rock-Filling in Mines.

In last week's PRESS was given some account of the use of rock-filling in the Menominee range mines, Michigan, with a drawing of the West Vulcan mine, showing the general position and pitch of the ore deposit.

The accompanying drawings show the method of the rock-filling used in place of timbering. From the shaft "*A*," a drift cuts the ore body and 25 feet into the footwall of firm jasper slates. From this point a rock tunnel is driven in the footwall east, as shown on plan, to shaft "*B*." Along this rock tunnel ports are made at intervals of about 100 feet into the ore body. From these ports the mining of the ore begins on the bottom of the ninth level.

The first cut of this ore is mined about eight to ten feet high, and the spaces from which the ore has been removed are filled with rock. This rock-filling follows the mining and affords absolute safety and inflexible support to the walls of the mine. The broken rock for filling is conveyed down the winzes *B*, and the ore through the shoots *D*, which are built up as fast as the filling is made upward. It will thus be seen that the tunnel in the footwall secures absolute safety to the mainways of each level; it is out of the crush range in any event. The winzes or rock-mills are also ventilators, and greatly improve the sanitary condition of the mine.

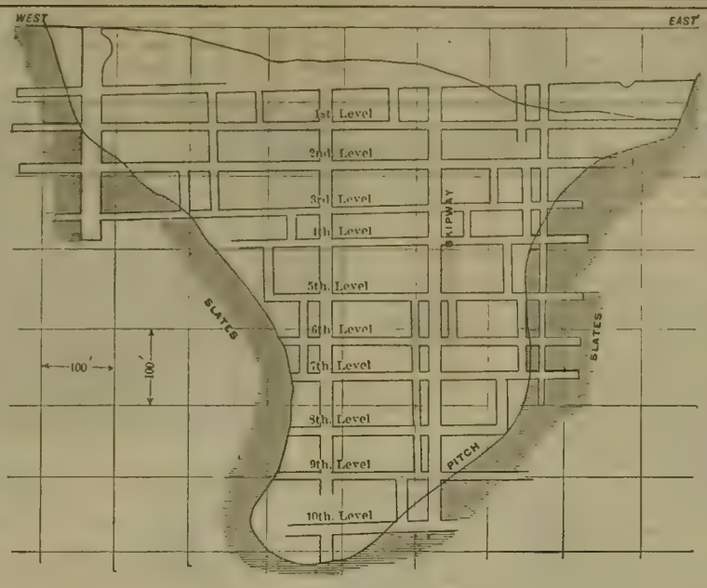
The ore body is, under this system, attacked by the miners on double face at each portal *C*, from the main rock-level or tunnel in the footwall. The mining by sections upward is simply a repetition of the first eight or ten feet, the rock-filling following the mining work and filling the spaces from which the ore has been removed as rapidly as room for the mining operations will permit.

Some timbering will be required occasionally in this rock-filling, especially in sustaining the filling in upper levels, as it is approached from below in removing the last cut of ore.

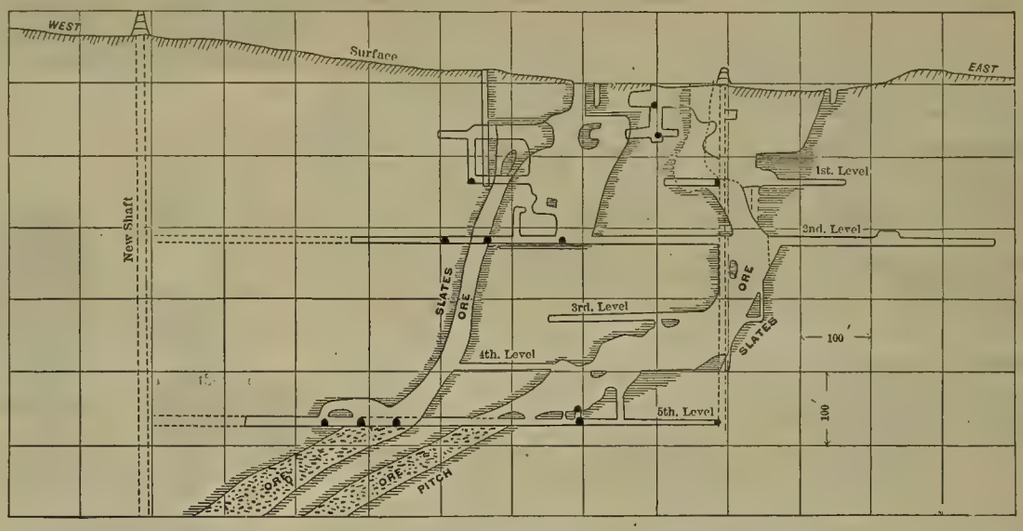
It may be noted here that this rock-filling system has not been evolved from any special progress in the mining art, or in the line of its economy over the Nevada system of timbering, but has been compelled by the absolute necessity of the case in West Vulcan and all other mines in this range where it has been introduced.

It may be said that sufficient work has not been done to submit an accurate statement of the relative expenses of these two systems.

However gratifying this comparison would be, if it indicated economy on the side of the rock-filling, yet this is not the vital factor governing the change of method from timber to rock, but rather the latter is a compelled requirement to secure the stability of the hanging-wall of the mine. And further, it may be pointed out that such a statement at any time would not afford a permanent basis of comparison, from the fact that the magnificent pine forests of this section of Michigan are fast disappearing under the great drain for these mines and Eastern markets, so that the timber-supply is becoming year by year enhanced in value by scarcity and lengthened haulage. It is, therefore, a constantly shifting factor of expense in mining operations.

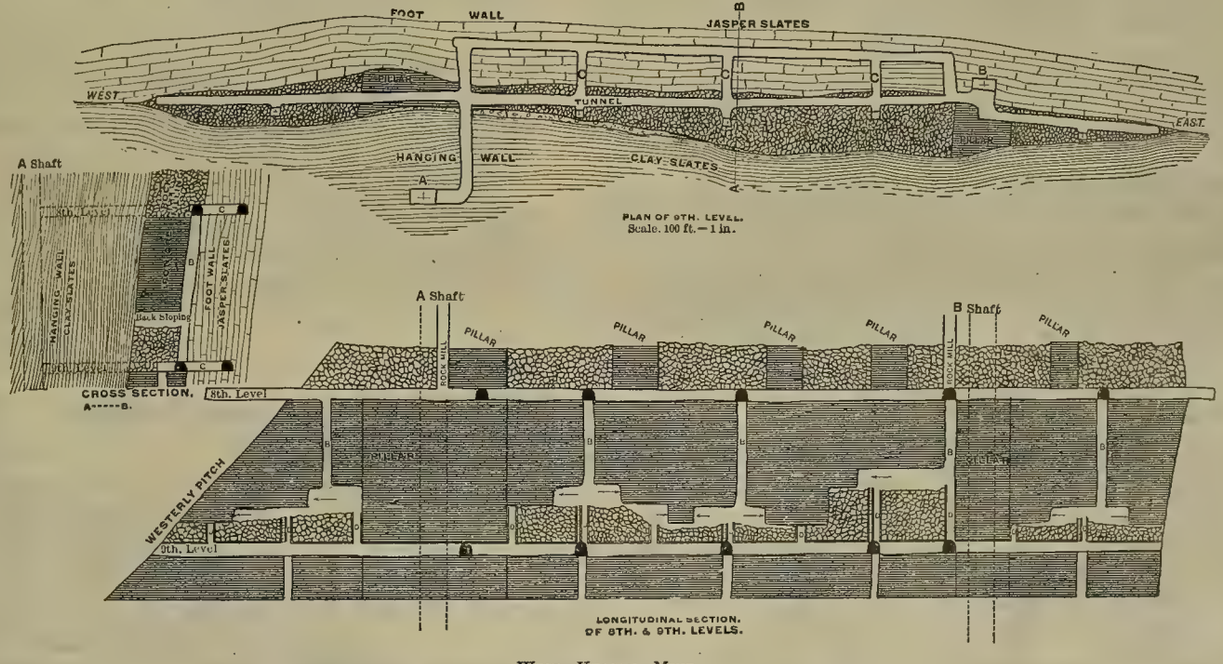


QUINNESEC MINE.



LONGITUDINAL SECTION.

EAST VULCAN MINE.



WEST VULCAN MINE.

METHODS OF MINING IN THE MENOMINEE RANGE, MICHIGAN.

The rock, on the other hand, is inexhaustible; and in spite of some little variableness in the cost of breaking it up and sliding it down into the mine, is a much less fluctuating factor of expense than the wood for timbering. The cost of timbers and timbering, per ton of ore mined at West Vulcan during 1887, was 38 cents.

The cost of rock-filling, with its necessary use of some timbering, per ton of ore mined, is estimated at 20 cents per ton—14 cents for rock-filling and 6 cents per ton for the timbering required with rock-filling. These estimates require verification by a few years of actual work. It may be pointed out here that the rock filling affords a permanent support, which is not liable to decay as is the timbering system, and will not require renewals during the progress of the mine workings.

The great caverns of ore in the Norway mine compelled rock-filling about two years ago, so that Captain John Oliver of Norway was one of the pioneers in the application of this system.

The Chapin was also forced to use this rock-filling system to maintain the walls of its great ore deposit, and was the first on this range to apply it.

Many of the mines, with firm walls and at moderate depths, continue to use the timbers in steadying their works, but the rock system must commend itself rapidly to all these mines from its great safety, stability and facility for exhaustive mining.

There are other important factors in connection with the general application of this system of rock-filling. The location of the shafts or slopes to the mines is one. The first planning of these slopes or skip-ways placed them in the ore body, requiring large pillars of ore for their maintenance. Where the ore is of moderate thickness (10 to 15 feet), this method is not so open to criticism; but when the ore body is 20 to 50 or 100 feet thick and rather soft, it has serious drawbacks in the great pillars of ore

which must be set apart for this purpose, and in their tendency to crumble, especially in the event of a creep or crush, which follows in a greater or less degree in exhaustive mining.

The use of skip-ways in the footwalls, or the sinking of shafts in the hanging-walls, are matters of the greatest importance in assuring safe and economical mining. It has been shown that slopes or skip-ways in the ore body are open to serious objections in large deposits of ore.

It is quite possible to sink the slopes or skip-ways *in the footwall*, especially when this is composed of firm jasper-slates. They could be driven in the footwall, and a sufficient distance under the plane of the ore, say 10 to 20 feet, so as to assure a permanent rock tunnel under all conditions of creep or crush. But this system has some exceptions, as in the case of the East Vulcan mine, with its ore body flexed and pitching, as shown in the longitudinal section. It will be evident that a slope or skip-way in the footwall slates of an ore body so placed would have been impracticable. But there are many deposits where a slope or skip-way could be driven in the footwall of an ore deposit, and be readily made to conform to the flexures met, in ordinary cases, in these footwalls.

This method would be costly at first, but it would ultimately be found to assure great safety, and permit exhaustive mining, since no pillars would be required for its protection.

This East Vulcan mine, after passing through the early stages of mining, adopted the vertical shaft for winding and pumping. It is now 500 feet deep. At 400 feet deep the ore body pitched rapidly westward, requiring a long rock tunnel from the shaft to the ore body. It will readily appear that with the continued westward pitch the lengthening rock tunnels at each level could not be maintained, as their increasing cost would debar their use. Hence, in this case, after testing the pitch of the ore body, it was concluded that a new shaft, 800 feet west of the old one, should be put down. Work on the new shaft is now in rapid progress. It is designed to produce the tunnels in the levels of the old workings, until they reach the new shaft, to assure good ventilation, and also to explore the intervening mining ground.

This new shaft will pass through the ore bodies and reach a point at which its levels or rock tunnels will become too expensive if the present westward plunge of ore continues. But it is also probable that the ore body will change its present rather flat pitch. In any case, it is evident that sinking this new shaft in soft slates will be much less expensive than continuing the old shaft with its increasing lengths of rock tunnels in jasper slates.

This case has been selected as affording an example that has furnished an abundant series of perplexing mining problems to its managers.

Mining Bureau Museum.

The following are among the recent contributions to the museum of the State Mining Bureau:

Barcenite (antimonate of mercury), a rare mineral, Huitzuco, Mexico, from J. W. Maxwell.

Crystallized stibnite, San Benito Co., Cal., Chas. Bronson.

Very fine specimen of linarite from Cerro Gordo, Inyo Co.; Wm. Crapo.

Ore from the Taylor mine, Death Valley, Cal., very rich in gold and silver; R. B. Taylor.

Pectolite, Tehama Co.; J. A. Heslewood.

Loadstone (natural magnet), Fresno Co.; R. Reynolds.

Fiorite, from the "Old Faithful" Geyser, Yellowstone Park; H. L. Hosmer.

Native antimony, Kern Co.; A. Blanc.

Columbite, Fresno Co.; R. Reynolds.

Specimens from the Superior gold mine, El Dorado Co.; Geo. H. Goddard.

Quartz with included rutile cut and polished, from Mokelumne Hill; Sam Sonnenfeld.

Manganese ore, said to be in large quantity and accessible, Mendocino Co.; R. H. Sinton.

Vanadinite, Arizona; Prof. Wm. P. Blake.

Native copper, Arizona; native silver on kaolin, Arizona. D. L. Mosgrove.

Zinc ore—sphalerite—Crow creek, Shasta Co.; S. S. Sweet.

REDUCING THE COST OF MINING PATENTS.—We maintain that it is just as much the duty of the Government to survey the mining sections of the country as it is to plat agricultural lands, and that if the mining portions were sectionized and subdivided the cost of surveying mining claims would be materially lessened, by enabling applicants for patents to connect the corners of their claims so many feet, in whatever direction it may be, from such section corners as are most accessible. A plat of the ground could thus be obtained at nominal expense, and numbered and filed in the Land Office, giving the location on fractional section, township, range, etc., and publication of intention to prove up and enter the claim should then be made the same as is now required on agricultural land, the cost of such being less than one-half of present charges. After publication, the applicant proves ownership and compliance with the law, pays for the land and receives his patent, the same as on an agricultural claim.—*Homer Mining Index.*

Mines and Prospects.

In the Colorado Mining Exchange, which has commenced operations so auspiciously, says the Denver *Tribune*, the directors have made a new departure by listing some of the stocks and heading them on the bulletin board on 'Change as "prospect stocks," the object being to let the public know when they are buying a stock which represents a mining property in which the value is prospective, and which stock is being sold for the purpose of raising money for development, as against a stock representing a mine which is paying dividends or even running expenses.

Although we are a mining State, it may be that the general public is not thoroughly versed in these distinctions and differences of mining properties, and in view of the revival in mining interests which now seems likely soon to become general throughout the United States, it may not be amiss to give our views on the subject.

In "prospects" there are various grades of value.

The prospect-hole, or discovery shaft or tunnel, sunk or driven ten feet only below the surface, and showing a good breast of ore on a lode which has developed and paying mines on it in other claims on the same lode, is a promising prospect; if the same one had, say from 100 to 300 feet of tunnel or shaft, showing the same ore continuously, and mill returns of the ore taken out in driving such tunnel or sinking such shaft showed it to be pay ore, it would be a still more valuable and promising prospect.

A big mining property, again, which had produced largely in the past, but in which the workings showed all the pay ore to have been extracted, and in which it would be necessary to drive further or sink deeper to discover more pay ore, is also in our opinion another class of prospect, and should be sold or listed as such. No worked-out mine should be sold on its past record at a value represented by the amount taken out of it.

The value of a mine is represented by what is in it, and not what has been taken out of it; and the value of a prospect is represented by what, according to good and careful judgment, may be or is likely to be in it.

The term "mine," speaking in a general way, covers a vast amount of various underground work and is extremely indefinite, but as used in searching for and extracting the precious metals and in contradistinction to prospects it means underground workings in a mineral property which has a certain amount of pay ore "in sight," *i. e.*, which is blocked out on four sides and can be measured and sampled, and its value reckoned, the same being generally known as "reserves of ore."

On the other hand, a big property which had produced large quantities of pay ore in the past, and which, while it had no ore blocked out or in reserve, had pay ore in the breasts of levels or bottoms of shafts, would still be considered a mine.

There are thousands, probably hundreds of thousands, of good prospects owned by individuals who are unable to put up the money the expenditure of which shall prove them to be mines.

Thousands of these prospects have been held for years in this embryo state, and will continue for years to come in the same way, unless through the medium of a well-conducted mining exchange the public comes to their rescue.

Notes About Butte, M. T.

The deepest mine in camp is the Lexington, 1400 feet.

The best timbered mine in the camp is the Parrot.

The largest hoisting engine in the camp is the Mountain Consolidated.

The handsomest, and as capable an engine as there is in the camp, is the Mountain View.

The mine containing the most timbers is the Anaconda.

The neatest little engine-room is at the Bluebird.

The cleanest engine-room is the one kept by M. C. Riley at the Lexington mill.

The fastest hoisting engine is at the High ore.

The smallest cars used on a cage are at the Wake-Up-Jim.

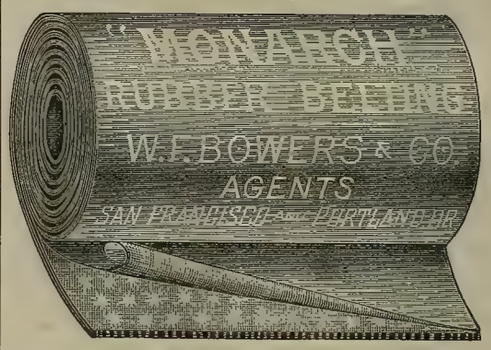
The flat cables are used at all the big mines with the exception of the old Colusa.

The new hoisting engine when erected at the Harris & Loyd new shaft will eclipse them all.

Stulls are used in some of the copper mines of this district, but in the large mines mostly square sets are used and few stull pieces.

The silver mines use stulls mostly in timbering their mines, though some square timbers are used in the Bluebird and Alice.—*Butte Inter-Mountain.*

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Monarch Belting.

The Plies of this Belt are
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Which hold them firmly together.
Each Rivet is Independent
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THERE ARE NO STITCHES
TO BREAK, and
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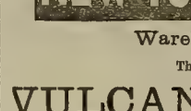
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Large Wheels made on Iron centers.
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THAN ANY OTHER WHEEL IN THE MARKET.



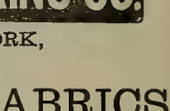
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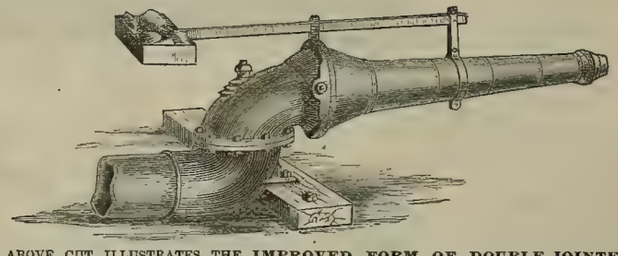
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THE ABOVE CUT ILLUSTRATES THE IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture. We guarantee purchasers of this form of Giants against all costs, expenses or damages which may arise from any adverse suits or actions at law. We are further prepared to furnish Single-Jointed Giants when required. Prices, discounts and Catalogues of our specialties of Hydraulic Mining Machinery sent on application.

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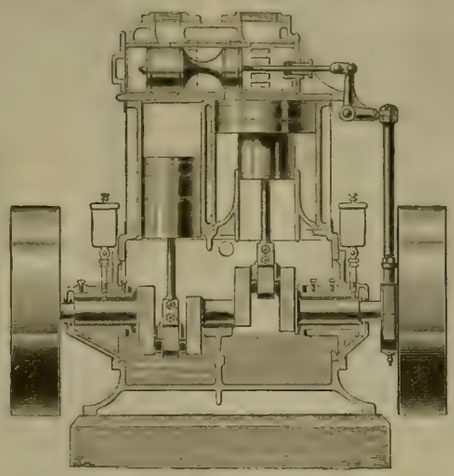
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They are good machines. If the gold is in the dirt they will save it. They will save finer gold than water will.
T. J. SCOTT,
Osceola, Nevada.

Smith & Drew took out Tuesday, in their dry wash diggings, in addition to 5 ozs. of fine gold, a nugget weighing 22 ozs. The machine used was Freeman's Dry Process Separator.—*Utah Daily Union, May 10, 1889.*

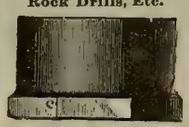
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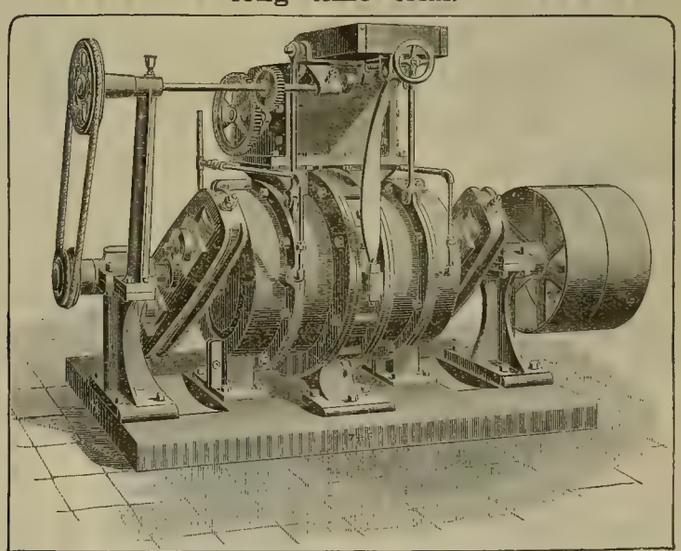
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IT HAS NO MORE WEARING PARTS THAN CORNISH ROLLS

And renewals will not cost over one-half as much as for stamps. Will run empty, or with small amount of ore without injury. The attention of parties having Cement Gravel is called to this Mill, as it will run 100 tons per day to No. 8 mesh; 30 to 35 H. P.

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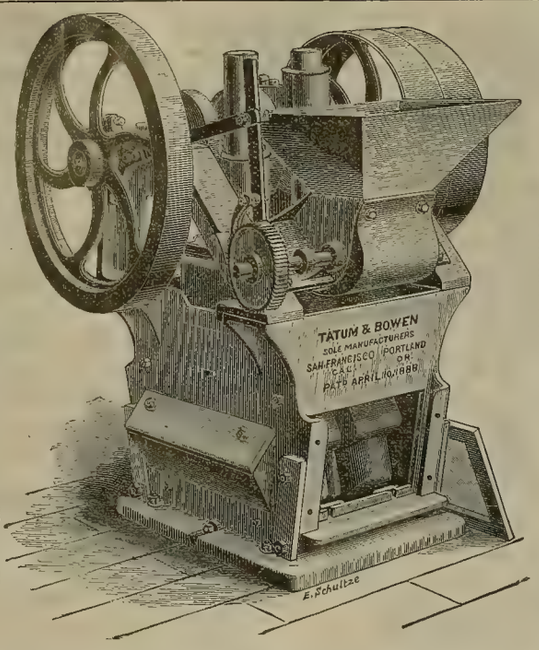
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Attached to each Mill is an effective

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THE CRUSHING is done by the rapid rocking movement in OPPOSITE DIRECTIONS of two heavy castings, the bottoms of which are slightly circular in form, and each provided with our shoes.

The Mill is a closer Gold-Saver and catches a larger percentage of the Clean-up in the Battery than any other Mill.

It costs less, in proportion to what it will do, than any other mill. There are no working parts to buy for it, no matter how long it is used, except shoes and dies. Capacity of Mill, 6 to 10 tons per day. Weight of Mill, complete, 6400 pounds.

We manufacture, to go with the Mill, an

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Power required for Mill and Rock Breaker, 6 H. P. SEND FOR CIRCULAR. Address:

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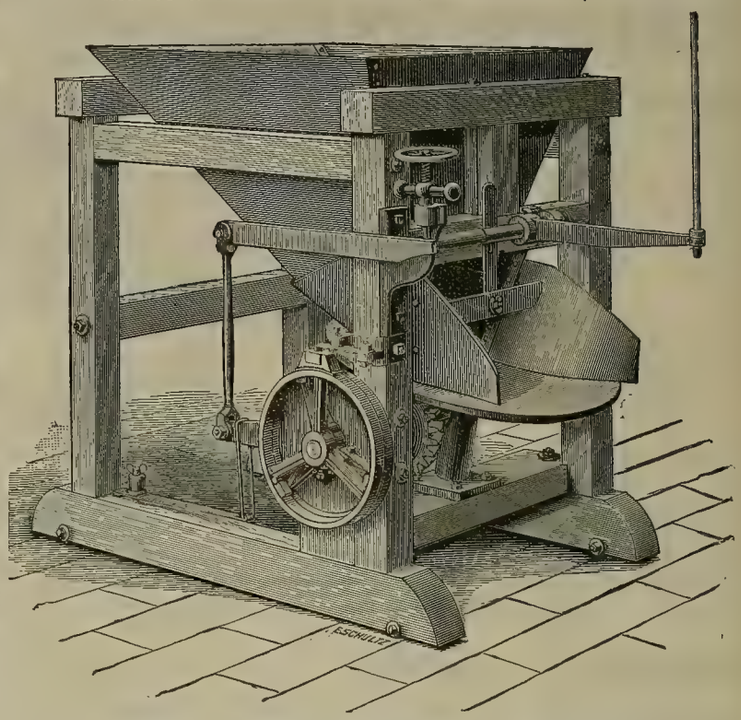
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The best form of Feeder ever devised, and pronounced by reputable mining men to be far superior to any form of "Roller" Feeder manufactured. We refer to the following gentlemen who have furnished us with testimonial letters to the above effect, which can be seen at our office, viz.:

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D. C. WICKHAM, Taylor Mine, Greenwood, Cal.
J. R. TREGLOAN, Supt. South Spring Hill Gold Mining Co., Amador City, Cal.

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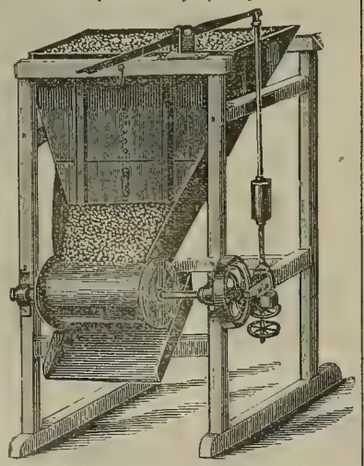
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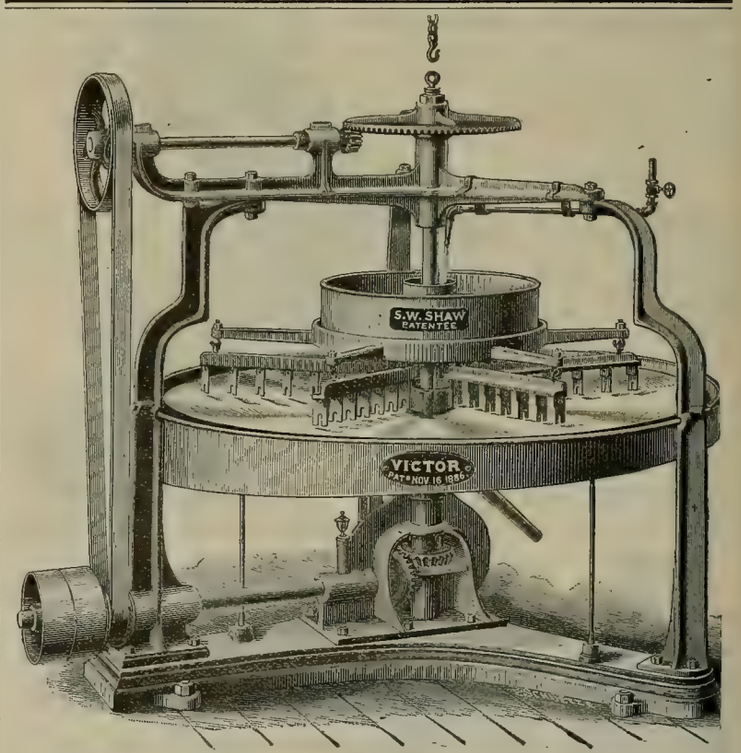
It has fewer parts, requires less power, is simpler in adjustment than any other. Feeds coarse ore or soft clay alike uniformly, under one or all the stamps in a battery as required.

In the Bunker Hill Mill it has run continuously for two years, never having been out of order or costing a dollar for repairs.

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THE VICTOR CONCENTRATOR

Having passed the experimental stage, is now offered to the consideration of the mining public, in full confidence that it will meet satisfactorily all reasonable requirements. In operation it is unlike any other machine of its class. The concave disc having a rotary reciprocal motion, causing the waste sands to flow over its periphery continuously, while the sulphurets are also drawn continuously through its center, the whole process being automatic and complete. The Batea in the hands of an expert is known to be the nearest to perfection for concentration. This is the principle upon which this machine works. The advantages gained are:

1. Greater capacity with more perfect work.
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Mine owners and millmen are invited to carefully examine the Victor before deciding upon their concentrating works. Address

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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific States.

FOR WEEK ENDING SEPT. 24, 1889.

411,572. — OBSTETRICAL INSTRUMENT — C. D. Bobo, Nevada City, Cal.

411,492. PUNCH—Jabez Draper, Stockton, Cal.

411,493.—BOOK REST AND EASEL.—John Ducker, Santa Rosa, Cal.

411,496.—ELECTRIC RAILWAY—Geo. B. Fraley, S. F.

411,434.—STEAM BOILER—A. Grant, Los Angeles, Cal.

411,500.—ROLLER-BEARING—R. W. Hent, S. F.

411,630.—WIRE-STRETCHER — D. H. Lunn, Ferndale, Cal.

411,603 —STOVE DAMPER — A. M. Mohrmann, Port Townsend, W. T.

411,680.—PUMPING MACHINE—John Richards, S. F.

411,614.—CRUSHING-MILL—A. E. Roe, S. F.

411,627.—STOCK-FEEDER — B. Walton, Crompton, Cal.

411,630.—CABLE-GRIPPER—H. M. Wrede, S. F.

The following brief list by telegraph, for Oct. 2d, will appear more complete on receipt of mail advices:

California—Philip Somers, San Francisco, vehicle axle; David L. Smith, San Francisco, fruit-drier: Carl Jaening, assignor of half to M. Pauly, San Francisco, hinge; George A. James, San Francisco, photographic printing-frame; John D. Keller, San Francisco, wind-wheel; William H. Lamrock, coyote exterminator; May E. Harrington, Oakland, mustache guard; James B. Harrison, San Jose, derrick; John M. Finch, Crockett, assignor of part to J. R. Cross, San Francisco, G. Hilley, Vallejo, and F. Miller, Marysville, separator; Albert Henry, Crescent City, elevator safety device; Johannes P. Becker, San Francisco, safety gas cock.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable prices, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

ELECTRIC RAILWAY.—Geo. B. Fraley, S. F. No. 411,496. Dated Sept. 24, 1889. Considerable difficulty has been encountered in the construction of sub-electrical ways in properly insulating the conductor and in maintaining it parallel with the roadway, so that the trolley-wheel shall always travel in contact with it. In Mr. Fraley's invention this conductor is made of wire or cable, formed in sections of any suitable length. The patent covers certain details of construction which overcome the difficulties referred to.

BOOK-REST AND EASEL.—John Ducker, Santa Rosa. No. 411,493. Dated Sept. 24, 1889. This book-rest or support and easel consists of a vertically adjusted shank or standard with a fixed holding socket, a swivel-arm projecting from said standard and having a second arm adjustable upon it, an adjustable support suspended from the outer end of this arm, and in connection therewith a device whereby a book may be held open to any degree, and the leaves easily held in place when turned. With this the inventor employs a supporting easel by which the whole device may be secondarily supported from the floor and made more rigid when desired.

PUNCH.—Jabez Draper, Stockton. No. 411,492. Dated Sept. 24, 1889. This is an improvement in metal punches. It is especially applicable to carriage and other small work and for punching small plates not exceeding one-fourth of an inch in thickness, but may be increased in size for larger work if desired. The depression in which the die is secured is made of such length that the die can be reversed in it, the die having two holes of different sizes made through it, so that these two holes in the die will correspond with the different sizes of punches, which are used by simply reversing the die without other adjustment. The patent covers a number of details of construction.

South Yuba W. & M. Co. vs. Rosa.

Following is an abstract of the Supreme Court decision in the Nevada county suit entitled South Yuba Water & Mining Co. (respondent) vs. Delovico G. Rosa (appellant):

Water Rights—Foreign Corporations—A demurrer to a complaint that a foreign corporation has not filed a copy of its articles of incorporation in the office of the County Clerk of the county in which property in dispute is situated, properly overruled. Nonsuit on same ground properly denied.

Held, a failure to comply with Section 299 C. C. can only be made available as a defense by special pleading where complaint contains no averment upon the subject.

Held, the requirements of Section 299 of the Civil Code do not apply to foreign corporations.

Held, the riparian rights of the defendant as a homestead claimant are subject to the prior appropriation of the water passing over defendant's lands, the same being public lands of the United States, the defendant not having at the time obtained a patent therefor.

THE "Indian mine" excitement at Monterey has subsided, and the Carmel valley continues to hold the secret of the lost mine.

Mining Personals.

W. C. Price is superintendent of the Bell Isle, Tuscarora, Nev.

John F. Blandy of Prescott is Territorial Geologist of Arizona.

H. W. Cotha is superintendent of the Grand Prize mine at Tuscarora, Nev.

Wm. Pierce is foreman of the Hale and Norcross mine on the Comstock.

Sup't J. W. McGowan of the Senator (Arizona) mine is on the way back from Chicago.

Robert Sherwood, the capitalist and mine manager, has returned from his European trip.

The mineral cabinet of Wm. N. Kelly of Prescott, A. T., is said to be the finest in the Southwest.

H. M. Levy, president of the Savage and Hale and Norcross Mining Companies, is visiting the Comstock.

Col. S. H. Lucas thinks the Alamo district, Lower California, is the richest gold-quartz camp on this continent.

L. Hamilton, superintendent of the Chollar and Potosi, went back to the Comstock from this city on Tuesday last.

F. M. Murphy is superintendent of the Congress (Arizona) mine, where they have one of the finest mills in the Southwest.

A. J. Rose, Jr., prominently connected with the mining interests controlled by Hobart & Hayward, left for the East Wednesday.

Superintendent Weir of the Granite Mountain, Montana, has been making very extensive underground developments in that property.

Fred. E. Murray, superintendent of Big Bug properties (Arizona), is specially pleased with the developments on the Boggs and Hackberry mines.

Last week Mr. Phil Shenon, a well-known Montana mine-owner, sold a group of gold mines at Bannock, M. T., to the Carlisle Mining Co. of London for $175,000.

Mr. Arthur F. Wendt is in charge of the construction of the great Huanchaca plant, South America. The mine is at an elevation of 13,600 feet above sea level.

C. M. Hagadorn, who is heavily interested in mining on Hassayampa creek, is in Prescott, Arizona. His superintendent, Frank Dolph, is slowly recovering from a spell of sickness.

Albert Barber, superintendent of the Barber Mining and Milling Co.'s property at Calico, and for many years prominent in mining circles, was found dead in his bed last Wednesday. The cause of death is probably apoplexy.

James H. Crossman, assistant of the State Mineralogist, is now in San Bernardino county examining the various mines and mining districts. He will be in that section of country for some months.

On October 7th John Dunnicliff of Nevada City will leave San Francisco for Alaska, where he will put up sulphuret works for the Treadwell mine. George G. Allan of the Nevada foundry has the contract to supply the iron for the works.

Major McLaughlin of Oroville, who was one of the projectors of the Big Bend tunnel scheme, in which Dr. Pierce of Buffalo, New York, and others have put in about $2,000,000, does not credit the recent statement that the enterprise is a failure.

D. T. Hughes, a well-known mining man of this State, who has been engaged during the past two years in superintending the development of an extensive property in the Republic of Colombia, returned to this city last week. A number of English and American companies have already established extensive works at different points, which are now being operated with much success. The Orita and Malpaso hydraulic mines have paid well from the start, and in dividends have almost reimbursed shareholders on the original investment. The heaviest outlay of American capital has been made at the Bocaneme mine, located near Tolima, in the central range of the Andes. This property, which is of great prospective value, has been incorporated in New York, A. Harpending, formerly well known in local mining circles, owning the largest portion of the stock. Labor is cheap, the peons employed receiving from 75 to 80 cents per day, and timber of all kinds is plentiful and cheap. The route to the mines is by steamer from New York and thence up the Magdalena river a distance of 550 miles to Unga. The mines are then 18 miles distant over a good road.

FOSSIL DEPOSITS.—The Princeton college expedition to the John Day lake region, Oregon, report having dug up about two tons of bones of curious animals. Among them were little three-toed horses hardly larger than donkeys, rhinoceri, camels, peccaries, a great assemblage of large and fierce cat-like, dog-like and hyena-like animals, not to mention hosts of little rabbits and squirrel-like creatures. The animals of this time were all rather small, the largest being the entelodon, a beast not unlike the hippopotamus in size and general appearance. As the list shows, this assemblage has a very oriental character. This wonderful museum of buried worlds has been sealed up by subsequent lava floods, and is now accessible only on the sides of canyons and valleys, where streams have cut down through the overlying masses.

THE dynamos and other generating apparatus on the Sutro tunnel level of the Chollar incline are being overhauled by an electrician in order to have them in readiness as auxiliary power for operating the Nevada stamp-mill when water is available, which it probably will be before the 1st of November.

Reservations for Reservoir Sites.

The report of the Commissioner of the General Land Office shows that due recognition has been made of the Government work for irrigation now in progress under the auspices of the Geological Survey. The report shows that the following reservoir sites in California have been withdrawn from settlement:

Clear lake, Lake county, together with all the lands situated within two statute miles of the borders of the said lake at high water.

Independence lake, Nevada county, together with the lands bordering thereon. The lands included in said site are situated in sections 2, 3, 4, 5, 8, 9, 10, in township 18 north, range 15 east, the quarter of section 32, and sections 33, 34 and 35, in township 19 north, range 15 east.

Donner lake, Nevada county, together with lands adjacent. The lands included in said site are situated in sections 10, 11, 12, 13, 14, 15, 22, 23, 24 of township 17 north, range 15 east, and sections 7, 8, 15, 18, 19, 20 of township 15 north, range 16 east.

Webber lake, Sierra county, together with lands bordering thereon. The lands included in said site are situated in sections 20, 21, 22, 27, 28, 29, 32, 33, 34, township 19 north, range 14 east, M. D. M.

The Commissioner prints extended extracts from the reports of Surveyors-General of various States and Territories bearing on the subject of irrigation. The Surveyor-General of Nevada speaks encouragingly of the prospects for this State in case the Government's irrigation scheme is carried out, and deprecatingly of the conditions now existing in that State with relation to the annual rainfall and the necessity for the adoption of some system of irrigation.

Major Powell, Chief of the Geological Survey, is reported to have said that the arid land that can be irrigated and made productive in the States and Territories visited will amount to over 100,000,000 acres. The work of the Senate committee will be a preparation of a report upon the advisability of Congressional appropriations for surveys in the arid districts.

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We are soon to have nickel-in-the-slot photograph machines in all the railroads and hotels, for a company has been organized in New York and the machines are being manufactured. The lens is so placed in the machine that it comes directly in front of the face of a person of ordinary hight. If the subject is too tall to get a reflection, he can sit down on the screw stool that is provided with each machine, and if too short he may attain the required elevation by mounting a pair of adjustable steps, which are also included in the patent. Back of the lens is the plate chamber, containing about 400 plates, on which the photographs are printed. After the person to be photographed has tickled the neck of the machine with the necessary quarter, he is required to pull a cord. Instantly the shutter in front of the lens opens automatically, and at the same time a flash of powder throws the necessary light on the face. The lens prints a likeness of the face on the first plate back of it. This is rolled over two small wheels to the bottom of the chamber, where it is taken by a pair of rubber tapes, which, in their turn, conduct the picture through the developing, fixing and washing fluids, and finally push it out of the machine a complete photograph. The plates are of celluloid, and the photograph is vignetted on a white background. The likeness is made instantaneously and the process is completed in less than two minutes. On each side of the lens is an arm extending out from the machine. On these arms are placed sample photographs showing one-third, one-half and profile views. The subject selects the view that suits him, and while he is looking at it a likeness is made of his face in a similar position. The machine thus arranged affords six different positions. Some of the railroads have applied for the machine, and by its use can make their "not transferable" thoroughly effective. The mileage ticket can no longer be passed around the family, for the photograph of the person who buys it can be pasted on it, and thus stop its use by any one but the proper owner. The thing would be very handy in a bank to secure the likenesses of rogues who secure payment on forged checks. There are hundreds of ways in which the machine can be used, and they are not confined to thief-taking.—*Boston Herald.*

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Assessment Notices.

Lapanta Consolidated Mining Company.
Location of principal place of business, San Francisco, California. Location of Works, Hawthorne Mg. Dist., Esmeralda Co., Nevada.

NOTICE is hereby given that, at a meeting of the Board of Directors, held on the 2d day of October, 1889, an Assessment, No. 2, of Two Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin, to the Secretary, at the office of the Company, Room 56, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 8th day of November, 1889, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the 2d day of December, 1889, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.
J. STADTFELD, JR., Secretary.
Office, Room 56, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

DELINQUENT SALE NOTICE.

Gray Eagle Mining Company—Location of principal place of business, San Francisco, Cal. Location of works, Placer County, Cal.

NOTICE.—There are delinquent upon the following described Stock, on account of assessment (No. 14) levied on the 13th day of August, 1889, the several amounts set opposite the names of the respective shareholders, as follows:

NAMES.	No. Certificate.	No. Shares.	Amt,
Brown, G A	463	100	$ 4 00
" G A, Trustee	464	5 000	200 00
" " "	465	2 500	100 00
Bowers, D	379	20	80
"	404	500	20 00
Bogart, O H, Trustee	436	100	4 00
" "	437	100	4 00
" "	447	5,000	200 00
" "	484	200	8 00
" "	485	200	8 00
Colton, A O, Trustee	243	100	4 00
"	244	100	4 00
Durning, T G, Trustee	231	440	17 60
Ettienger, Isaac	137	600	2 00
Francis, H L, Trustee	444	1,500	60 00
Horton, Thos R	51	5,000	200 00
" " Trustee	315	5,000	200 00
Hall, Wm E	131	900	36 00
"	154	1,000	40 00
" Trustee	411	200	8 00
" "	412	200	8 00
Hall H E, Trustee	372	1,000	40 00
Nash, H W	269	104	4 16
Nicol, Duncan, Trustee	462	2,820	112 80
Shanklan', Robt	144	600	24 00
Stout, C S, Trustee	422	106	4 24
" "	476	2,000	80 00
" "	477	963	38 12
Stout, Mrs M E	170	500	20 00
" "	188	500	20 00
Searles, W A, Trustee	317	500	20 00
Searles, W A	332	250	10 00
" Trustee	327	500	20 00
Waller, L P F, Trustee	358	100	4 00
" " "	367	3,000	120 00
" " "	458	100	4 00
" " "	459	100	4 00
" " "	460	100	4 00
Wetzel, Theo, Trustee	215	50	2 00
" "	233	40	1 60
" " "	237	40	1 60
" " "	360	1,000	40 00

And in accordance with law, and an order of the Board of Directors, made on the 13th day of August, 1889, so many shares of each parcel of such Stock as may be necessary, will be sold at public auction, at the office of the Company, 303 California Street, room 11, San Francisco, California, on TUESDAY, THE EIGHTH DAY OF OCTOBER, 1889, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

J. M. BUFFINGTON, Secretary.
Office, 303 California Street, room 11, San Francisco, California.

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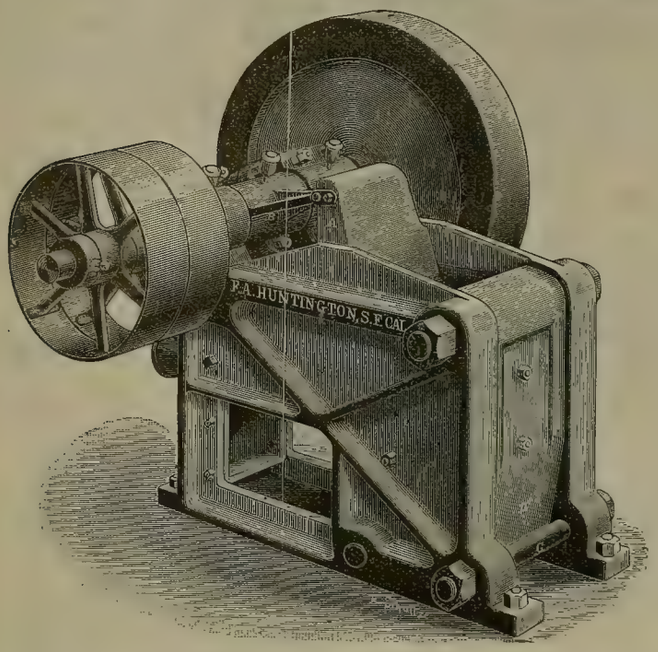
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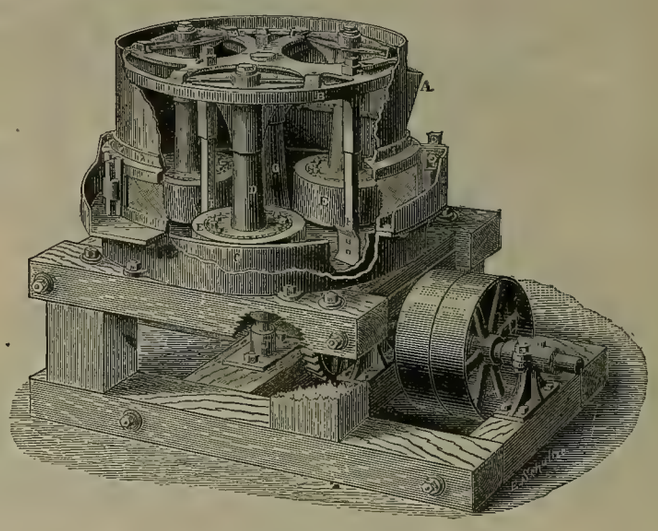
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The movable jaw *A* is worked by the eccentric *B* and is pivoted at the bottom. The stationary jaw *D* is secured at the top by a bolt running through it, and at the bottom bears against the heavy bolt *C*. The main wear is, of course, at the bottom of a breaker of this form, and the wear is easily taken up by inserting a plate between the bolt *C* and the jaw *D*. The jaw is thus swung in at the bottom, and the opening where the ore passes through is made correspondingly smaller. As will be seen by the cut, this machine is of very simple construction and is strong and durable.



F. A. HUNTINGTON'S
Centrifugal Roller Quartz Mill.

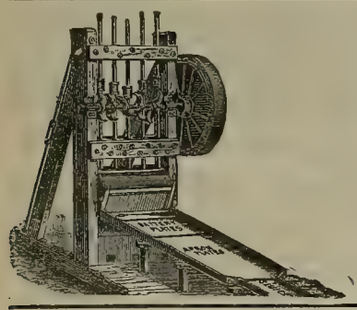
The following will explain the above cut:

The ore and water being fed into the mill at the hopper *A*, the rotating rollers and scrapers throw the ore against the ring die, where it is crushed to any desired fineness by the centrifugal force of the rollers as they roll over it.

The water and pulverized ore are thrown against and through the screens when fine enough. The discharge is so perfect that it makes little or no slimes, and leaves the pulp in good condition for concentration. The rollers are suspended, leaving a space of one inch between them and the bottom of the mill, thus allowing them to pass freely over the quicksilver and amalgam without grinding it or throwing it from the mill, while it agitates it sufficiently to make amalgamation perfect. For wet crushing and gold saving it has no equal.

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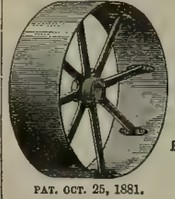
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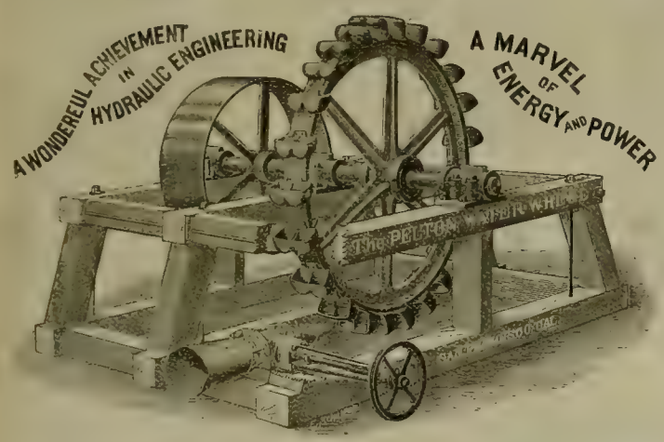
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Local Markets.

SAN FRANCISCO, Oct. 3, 1889.

General trade is improving. Iron-workers and foundrymen report more orders. Money is fairly easy, with remittances nearly equal to the call for crop purposes. The active money market at the East and a higher range of interest cause more coin to be remitted to New York. By the last steamer from Australia $1,777,317 was received, with more to follow.

S. H. Brooks, Assistant Treasurer United States at San Francisco, reports cash on hand Sept. 30, 1889, as follows:

United States Notes	136,609 00
National Bank Notes	13,805 00
Gold Certificates	101,710 00
Silver Certificates	125,815 00
Gold Coin	40,378,123 00
Standard Silver Dollars	17,863,244 00
Fractional Silver	6,436,414 00
Minor Coin	4,002 70
Total	$65,059,722 70

The shipments of silver from the Sub-Treasury into the interior of the State and elsewhere for the month were as follows:

Standard Dollars	$266,630
Fractional Silver	76,620
Total	$343,250

The dividends disbursed for the month of September compare as follows:

	1888.	1889.
Banks	$112,500	$120,000
Gas and Water Co.'s	123,300	128,500
Insurance Co.'s	6,000	14,500
Powder Co.'s	27,000	27,000
Street R. R. Co.'s	15,000	17,500
Mining Co.'s	231,250	253,500
Miscellaneous Co.'s	81,875	97,750
Totals	$601,925	$658,750

MEXICAN DOLLARS — There was a good demand throughout the week for shipment by the outgoing steamer to China. The price paid is quoted at 75¾ to 76.

SILVER—The local market has held very strong at an advance for shipment by the outgoing steamer for China. As high as 94 cents was paid. Silver is very scarce and can only be secured by bidding up, and even then all requirements cannot be met. The market at the East and in Europe shaded off some, but the tone is said to be strong. The recent decided advance in Russian roubles has a favorable effect on the market.

The local mint is in the market for silver, but the bids are below the market prices.

QUICKSILVER—Receipts the past week aggregate 100 flasks. The market is reported dull and easy. The scarcity of water in the mining districts is against consumption.

BORAX—Receipts the past week aggregate 800 ctls. The exports aggregate 601 ctls. to New York. The market is firm at steady prices.

LIME—Receipts the past week aggregate 4245 barrels. The exports by sea aggregate 350 barrels to Honolulu. The home demand continues strong.

LEAD—The market is without essential change. Exports the past week aggregate 3002 lbs. to Victoria, B. C.

TIN—Exports the past week aggregate 22,675 lbs. plate and 8387 lbs. pig to Victoria, B. C. The imports aggregate 1282 ingots from Australia. The market is strong at full figures. European advices are uniformly of a bullish character.

COPPER—A shipment of 53,300 lbs. of copper cement was made the past week to New York. For refined copper there appears to be a steadier tone, as if the late troubles are being amicably fixed up. The consumption at the East and in Europe increased during the recent decline.

CHROME ORE—A shipment of 391,375 pounds was made the past week to New York. The market is reported unchanged.

IRON—The market is quoted higher for both spot and to load. The stock here in first hands is placed at about 500 tons, with very little to arrive. The consumptive demand is freer. Imports the past week aggregate 800 tons of pig. Foreign advices report a strong and active market, with several Governments large buyers.

The following are the latest comparative quotations f. o. b. at Glasgow:

F. o. b. Glasgow.	Sept. 25, '89.	Sept. 4, '89.
No 1 Coltness	65s 6d	64s
" Langloan	64s 6d	59s 6d
" Summerlee	64s 6d	60s
" Gartsherrie	62s 6d	60s 3d
At Ardrossa.		
No. 1 Eglinton	50s 6d	48s 6d
" Glengarnock	60s 6d	56s 6d
" Dalmellington	50s 6d	50s 6d

Coal imports the past week aggregate as follows: From Tacoma, 2300 tons; Cardiff, 937; Australia, 18 954; Coos Bay, 1950; Departure Bay, 1400. Total, 25 531 tons. The market for Australian forward shipment is quotable higher, as is Liverpool steam and Greta. For spot coal, cannel, egg hard, and Greta are higher. The tonnage on the way to this port aggregates about 232,000 tons, against 197,000 tons at the same time last year. But the tonnage on the way to the Southern ports is much less, which makes the total tonnage about the same as it was last year. The demand with us is quite active for spot, to arrive, and loading. The call appears to be more of a consumptive than of a speculative character.

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	7⅞ @ 7¾	Cardiff	9 50@10 00
Liverpool Scm	8 00 @ 8 00	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	9 00 @ 9 00	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	8 9 00	Gilman	7 00
Scotch Splint	9 00	Seattle	7 00
Greta	9 00	Coos Bay	6 50
Westminster Brymbo	9 00	Cannel	11 00
Nanaimo	8 00	Egg, hard	18 00
Sydney	8 00	Cumberland, in sacks	19 00
Jackson	6 00	do, bulk	18 00

Eastern Metal Markets.

By Telegraph.

NEW YORK, Oct. 3, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	42 11-16	93½	$10 70	$3 92½	$20 95
Friday	42 11-16	93½	10 60	3 92½	21 00
Saturday	42⅝	93	10 60	3 92½	21 00
Monday	42⅝	93	10 65	3 92½	20 50
Tuesday	42⅝	93	10 90	3 92½	20 40
Wednesday	42⅝	93	10 85	3 92½	20 45

NEW YORK, Oct. 3.—Borax very strong at 8¾c for refined, 7¾c for concentrated, and 8½c for powdered. Quicksilver is easy at 68@69c. Lake copper, $10.90. The leading companies quote $11. Electric grades, 10½c; casting, 10c, net; strong or selling freely. Pig lead dull at 3½c for prompt delivery.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, October 3, 1889.

ANTIMONY—	19 @	20
BORAX—Refined, in carload lots	7¼@	7⅞
Powdered " " "	7½@	—
Concentrated " " "	— @	6¾
All grades jobbing at an advance.		
COPPER—		
Bolt	21 @	22
Sheathing	22 @	24
Ingot, jobbing	15 @	16
do, wholesale	13 @	14
Fire Box Sheets	22 @	24
LEAD—Pig	4½@	—
Bar	5 @	—
Sheet	7 @	—
Pipe	6 @	—
Shot, discount 10% on 500 bags Drop, ℔ bag.	1 45 @	—
Buck, ℔ bag	1 65 @	—
Chilled, do	1 85 @	—
STEEL—English, lb	16 @	20
Canton tool	9 @	9½
Black Diamond tool	9 @	9½
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4½@	—
TINPLATE—B. V., steel grade, 14x20, P. S.	4 85 @	—
B. V., steel grade, 14x20, spot	4 85 @	4 90
Charcoal, 14x20	6 25 @	6 75
do roofing, 14x20	5 12½@	5 25
Pig tin, spot, ℔ lb	21 @	21½
COKE—Eng., ton, spot, in blk & sks, resptvly	17 00 @	20 00
Do, do, to load	13 00 @	13 25
QUICKSILVER—By the flask	— @	47 50
Flasks, new	— @	—
Flasks, old	37½ @	—

IRON—Glengarnock ton	Spot. 30 00 @—	To Load. —
Eglinton, ton	29 00 @—	29 @ —
American Soft, No. 1, ton	— @31 00	30 @ —
Oregon Pig, ton	— @30 00	— @ —
Clay Lane White	— @ 26 00	25 @ —
Shotts, No. 1	30 00 @ 30 00	— @ —
Bar Iron (base price) ℔ lb	2¾@ 3	— @ —
Chrome iron ore, ℔ ton	@10 00	— @ —
Langloan	30 00 @—	30 @ —
Thorneliffe	30 00 @—	30 @ —
Gartsherrie	30 00 @—	30 @ —

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$20 00	$17 00
41 to 50 ft	21 00	18 00
51 to 60 ft	23 00	20 00
61 to 70 ft	27 00	21 00
1x3, fencing	22 00	19 00
1x4, "	21 00	18 00
1x3, 1x4 and 1x6, odd lengths	19 00	16 00
Second quality	17 00	15 00
Selected	24 00	22 00
Clear, except for flooring	31 00	28 00
Clear for flooring	2 00	.....
Clear V. G. No. 1 flooring	6 00	.....
Firewood	14 00	10 00
Dressed Pine, flooring, No. 1, 1x6	32 00	29 00
No. 1, 1x4	34 00	30 00
No. 1, 1¼x4, 1¼x6, and odd sizes	37 00	33 00
All sizes, No. 2	27 00	24 00
Stepping, No. 1	44 00	35 00
Stepping, No. 2	34 00	25 00
Ship timber and plank, rough	27 00	18 00
Selected, planed 1 side, average 40 ft	29 00	24 00
" " 2 " " "	31 00	26 00
" " 3 " " "	33 00	28 00
" " 4 " " "	35 00	30 00
Deck plank, rough, average 35 ft	35 00	32 00
Dressed, average 35 feet	40 00	36 50
Pickets, rough, B. M	20 00	16 00
½x1¾, 4 ft long, ℔ M	6 50	5 00

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, department 10, San Francisco:

SANDY BAR M. CO., Sept. 30. Capital stock, $5,000,000. Directors—Wm. T. Robinson, S. Heringhi, Wm. Kreling, Thos. A. McGowan and Jas. F. Leahy.

CITY WATER CO. OF SANTA CRUZ, Sept. 30. Capital stock, $500,000. Directors—Chas. B. Ludwig, Chas. Hervey Jackson, Frederick R. King, E. H. Rixford, C. K. Bonestell.

GLENN M. CO., Sept. 30. Location, Shasta Co. Capital stock, $1,000,000. Directors—Matthias Ault, J. S. Fields, A. C. Hammond, Benjamin Clark and Frank Korlick.

GRANGERS' COLONY, Oct. 2. Object, purchase and sale of real estate. Capital stock $150,000. Directors—A. S. Barnes, Eugene Anderson, Robert Husband, J. G. Whittington and Geo. T. Prescott.

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Hanauer, Sept. 26, $2600; Mt. Diablo, Oct. 2, $6398; Cons. California and Virginia, Sept. 28, $59,582; Blue Bird, 24, $16,144; Alice, 24, $26,512; Butte & Boston, 24, $22,912; Lexington, 24, $17,888; Hanauer, 27, $2525; 28, $2350; Crescent, 30, $2025; Hanauer, 30, $5500.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO. AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Best & Belcher M Co	Nevada	44..	25..	Sept 11	Oct 16	Nov 6	L Osborn	309 Montgomery St
Bulwer Con M Co	California	6..	25..	Aug 6	Sept 12	Oct 10	L Osborn	309 Montgomery St
Central California Oil Co	California	1..	50..	Sept 6	Nov 1	Nov 18	F L Gorluski	314 California St
Cadmus M Co	Nevada	--	20..	Sept 19	Oct 31	Nov 25	J Craig	204 California St
Chicago M & M Co	California	2..	15..	Sept 13	Oct 16	Nov 4	W Grant	320 Montgomery St
Crown Point M Co	Nevada	52..	50..	Sept 18	Oct 21	Nov 11	J Newlands	329 Pine St
Con New York M Co	Nevada	1..	25..	Aug 14	Sept 18	Oct 9	C E Elliott	309 Montgomery St
Del Norte Gravel M Co	California	2..	7..	Aug 24	Oct 3	Oct 26	J B Cronan	230 Montgomery St
East Sierra Nevada M Co	Nevada	1..	10..	Aug 8	Sept 13	Oct 7	G R Spinney	310 Pine St
Gray Eagle M Co	California	14..	4..	Aug 13	Sept 16	Oct 8	O H Bogart	317 Pine St
Grand Prize M Co	Nevada	22..	30..	Sept 24	Oct 28	Nov 19	R R Grayson	327 Pine St
Golden Prize Con M Co	Nevada	3..	25..	Sept 21	Oct 26	Nov 16	C D Bennett	330 Pine St
Keyes M Co	Nevada	4..	30..	Aug 27	Oct 1	Oct 21	J H Sayre	328 Montgomery St
L vermore Coal M Co	California	1..	50..	Sept 18	Oct 19	Nov 6	G H Higgins	120 Sutter St
Lapanta Con M Co	Nevada	2..	02..	Oct 2	Nov 3	Dec 2	J Stadtfeldt	309 Montgomery St
Mineral King M & M Co	Arizona	3..	10..	Aug 22	Sept 24	Oct 21	F H Leonard	419 California St
North Belle Isle M Co	Nevada	16..	20..	Sept 18	Oct 22	Nov 13	J W Pew	310 Pine St
North Bonanza M Co	Nevada	9..	10..	Sept 17	Oct 26	Nov 14	J F Holling	410 Montgomery St
Potosi M Co	Nevada	33..	50..	Sept 18	Oct 22	Nov 12	C E Elliott	309 Montgomery St
Peer M Co	Arizona	8..	10..	Sept 4	Oct 10	Nov 5	A Waterman	309 Montgomery St
Platt & Gillon G M Co	California	3..	4 00..	Sept 11	Oct 15	Nov 4	C Herrmann	326 Kearney St
Scorpion M & M Co	Nevada	1..	10..	Aug 8	Sept 13	Oct 7	G R Spinney	310 Pine St
Scott Bar M & M Co	California	3..	10..	Sept 10	Oct 12	Oct 31	H Pink	309 Montgomery St
Si ver Hill M Co	Nevada	25..	20..	Sept 27	Oct 31	Nov 21	D C Bates	309 Montgomery St
Southern Cal Coal & Clay Co	Cal	2..10	30..	Aug 16	Sept 16	Oct 16	W G Mugan	10 California St
True Con M Co	California	7..	2½..	Aug 31	Oct 12	Nov 16	J C Bates	434 California St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Nevada Queen M C	Nevada	H Deas	309 Montgomery St	Annual	Oct 9
Presidio M Co	California	L Osborn	309 Montgomery St	Annual	Oct 7
Eureka Con M Co	Nevada	H P Bush	306 Pine St	Annual	Oct 21
Mayflower Gravel M Co	California	J Morizio	326 Montgomery St	Annual	Oct 31
Silver West Con M Co	Nevada	F R Bunker	628 Montgomery St	Annual	Oct 15
Paradise Valley M Co	Nevada	A S Cheminant	328 Montgomery St	Annual	Oct 9
Con Cal & Virginia M Co	Nevada	A W Havens	3 9 Montgomery St	Annual	Oct 14
Pine Hill G M Co	Nevada	C A Hare	175 Sailr ad Ave	Annual	Oct 10

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Caledonia M C	Nevada	A S Cheminant	328 Montgomery St	08	Aug 5
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	Sept 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	Aug 25
Idaho M Co	California	Grass Valley	Grass Valley	7.50	Sept 5
Navajo M Co	California	J W Pew	310 Pine St	10	Apr 1
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Sept 10

Mining Share Market.

The market for Comstock mining stocks the past week was of a decidedly mixed character. The general tone was weak up to yesterday (Wednesday) under strong bear points put out by the inside through "decoy ducks." With the weak points thoroughly circulated, the manipulators by cross orders eased off prices, thereby securing stock from outside holders. They have also been assisted by the well-grounded belief that the financial statements of the mining companies to be published on next Tuesday will be bad and give ample excuse for more assessments. By those who are in position to know it is asserted that the executors of the Sharon estate have been and are still selling stock; but this is either through with or will be soon. All the stocks sold are said to have been carefully taken in by the pool. This is claimed to have caused the break in the Gold Hill stocks in last August. Those who are usually well informed on the movements of the market for the Comstocks are quite bullish and confident of much better prices, based on manipulation first and merit afterward. It this should prove correct, then outside holders of stock who do not expect too much will have an opportunity of selling out and netting a good profit on their investments. In outside stocks there has been a small upward move in the Quijotoas; but the Bodies and Tuscaroras hung heavy at about blackboard prices. Eureka Con. has been inactive, but the tone appears to be strong.

From the Comstock mines the news begins to be of a more important character, yet everything points to several weeks before actual or best results can be known. The starting of a west crosscut on the 800-foot level in Crown Point is undoubtedly done to cut at this depth the ore found on the 700-foot level. On the latter level the finding of the ore allowed the manipulators to make a successful deal. Another west crosscut is to be started on the 900-foot level. The work going on in Belcher and Overman is very important. The west drift in Yellow Jacket is being pushed ahead as fast as possible. The west crosscut on the 300-foot level of Con. Imperial is in over 60 feet, and in ore, but the lode is broken. The indications are good as work progresses farther west. Mining men are watching with renewed interest the work going on in the Ward shaft. Still more important work leading from the shaft is to be inaugurated at an early day. This work will open up to better advantage Alpha, Bullion, Potosi and Chollar. The work going on in Alpha is being closely watched. In Hale and Norcross they are in good ore on the 400-foot level. This mine has large quantities of ore out ready for crushing as soon as the rains set in. As for that, several other mines have large quantities of ore ready for crushing as soon as the rains set in. From Best and Belcher, Gould and Curry, Ophir, Mexican, Union, and Sierra Nevada, advices are difficult to get, which makes knowing operators look for something important soon in that direction. From the outside stocks the news continues uniformly good from the Tuscaroras and Quijotoas, with only deadwork from the Bodies. Were it not for the fear of assessments it is thought stocks of the mines in the two first districts would do better on present showing.

The stock market opened to-day weak under realizing sales and short selling. After the Call prices were lower, but the tone was steadier. Important work in Challenge, Confidence and Yellow Jacket is to be commenced within a few days. The pumping out of the water in Crown Point and Belcher to about the 2100-foot level will be commenced in this month.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, term of subscription, and give it their own patronage, and as far as practicable aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

THE New Mexico Exposition was opened on Monday. The display of minerals from the mines of the Southwest is said to excel in point of richness the Denver display.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept. 11.		WEEK ENDING Sept. 18.		WEEK ENDING Sept. 25.		WEEK ENDING Oct. 4.	
Alpha	1.25	1.40	1.30	1.50	1.30	1.35	1.30	1.35
Alta	1.50	2.00	1.90	2.00	1.90	2.40	2.15	2.35
Andes	.70	.70	.70	.75	.70	....	.70	.75
Belcher	2.80	3.00	2.80	3.10	2.50	2.70	2.70	2.90
Best & Belcher	3.40	3.75	3.35	3.65	3.15	3.45	3.30	3.50
Bullion	.60	.70	.60	.65	.60	.65	.60	.65
Belle Isle	....	....	.15	.15	.10	....	....	....
Bodie Con	.90	1.00	.75	.85	.60	.85	.70	.80
Benton	....	....	....	....	....	....	....	....
Bulwer	.30	.35	.30	.30	.30	....	.30	.30
Commonwealth	2 50	3.25	3 20	3.25	....	....	3.10	....
Con. Va & Cal	.71	.71	6¾	.73	....	....	6¾	6¾
Challenge	2.00	3.00	2.80	3.50	2.70	2 95	2.70	2 90
Chollar	2.00	2.20	1.85	2.30	1 90	2.00	1.85	1.90
Confidence	6¼	6¾	....	....	6.25	....	6¾	7
Con. Imperial	.45	.50	.45	.50	.40	.45	.40	.45
Caledonia	.30	.30	....	....	.25	.25	.25	....
Crown Point	2.90	3.30	2.74	3.30	2 50	2.80	2.50	2.85
Crocker	.55	.60	.45	.60	.45	.54	.60	.60
Dudley	....	....	....	....	....	....	....	....
Eureka Con	....	....	2.25	2.25	2.40	3.50	3.00	3.25
Exchequer	....	.65	.60	.70	.60	....	.50	.60
Grand Prize	.65	.80	.75	.80	.60	....	.50	....
Gould & Curry	2.05	2.20	1.95	2.30	1.90	2.00	1.95	2.05
Hale & Norcross	3.10	3.20	3.00	3.45	3.05	3.20	3.00	3.30
Julia	....	....	....	....	.25	....	....	....
Justice	1.60	1.85	1.70	1.85	1.55	1 90	1 65	1.70
Kentuck	1.20	1.25	1.10	1.25	1.10	1.30	1.25	1.30
Lady Wash	.40	.45	.40	.45	.40	....	....	....
Locomotive	....	....	....	....	....	....	....	.05
Mono	.95	1.00	.75	.80	.75	.80	.70	.80
Mexican	3.60	4.20	3.70	4.45	3.60	3 85	3.75	4 20
Navajo	.35	.40	.35	.40	.30	....	.30	.35
North Belle Isle	.89	.90	.80	.90	.60	.75	.65	.70
New Queen	.65	.85	.81	.85	.60	....	.60	.65
Occidental	1.55	1.75	1.70	1.75	1.40	1.50	1.45	1.50
Ophir	4.50	4 80	4.45	5⅛	4.40	4.75	4.30	4.95
Overman	1.15	1.25	1.15	1.30	1 10	1.30	1.10	1.30
Potosi	1.50	1.55	1.40	1.70	1.25	1.40	1.30	1.45
Peerless	.40	.40	.35	.35	....	....	.30	.40
Peer	.15	.22	.10	.15	....	....	.10	.10
Savage	2.15	2.40	2.20	2.60	2.15	2.25	2.00	2.30
S. B. & M	1.65	1 80	1.80	1 95	1.55	1.75	1.65	1.85
Sierra Nevada	2.75	3.00	2.60	3.05	2.60	2.75	2.60	2.85
Silver Hill	.40	.45	.45	.45	.40	....	.30	.35
Silver King	....	....	....	....	....	....	....	....
Scorpion	.15	.15	.20	.30	.30	....	.20	.30
St. Louis	....	....	.35	.35	....	....	....	....
Union Con	2.80	3.30	2.90	3.45	2 95	3.20	3.00	3.35
Utah	1.05	1.15	1.00	1.20	.95	1.05	.95	1.05
Weldon	.25	.30	.20	....	....	....	....	....
Yellow Jacket	3.15	3.40	3.20	3.45	3.00	3.20	3.10	3.40
....	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY, Oct. 3, 9:30 A. M.

100	Gould & Curry	80	2.05
80	Hale & Nor	100	3.05
200	Alta	100	2.25
100	Justice	100	1.70
200	Alpha	120	1.35
120	Mexican	100	4.05
70	Belcher	260	2.70
Opnir	4.85		
350	Best & B	100	3.40
Overman	1.15		
50	Challenge	50	2.80
Potosi	1.35		
100	Crocker	100	.55c
Savage	2.05		
250	Crown Point	50	2.35
Scorpion	20c		
350	Con Va & Cal	250	.62½
S. B. & M	1.65		
670	Eureka Con	100	3.45
Sierra Nevada	2.60		
100	Exchequer	400	.55c
Union	3 10		
150	Grand Prize	600	.50c
W Comstock	.35c		

THE AMERICAN NEWSPAPER ANNUAL, published by N. W. Ayer & Son of Philadelphia, is one of the reference-books that we keep constantly within our reach, and would find it hard to do without. We have learned to look with pleasant expectations for its yearly coming, and we welcome the issue for 1889—the tenth of the series—which received the finishing touches toward the close of August, and has just come to hand. Besides containing a catalogue of all newspapers and periodicals published in the United States and Canada, arranged alphabetically by States and (within each State or Territory) by postoffices, with much information as to each one in detail, it gives a terse description of every State, Territory and county—area, character of soil, chief crops, manufactures, etc., and separate lists of class publications (*e. g.*, agricultural, religious, medical, etc.), with various tables which we cannot even enumerate. It makes an octavo of over 1000 pages and is cheap enough at $5, carriage paid, to any one who has frequent need to consult such a volume.

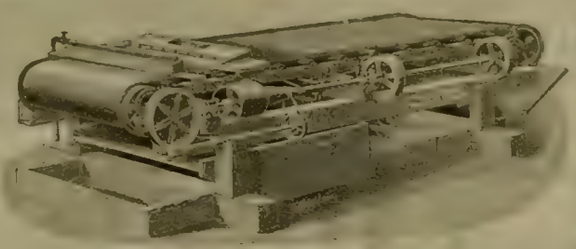
THE Colorado River Placer Mining Co. has been organized to work 100 acres of dry placer ground about 12 miles above Yuma, near what were formerly known as the Pot Hole placers, on the Colorado river. The ground has before this been worked on the dry-washing plan.

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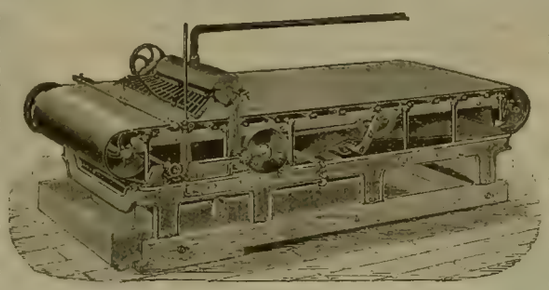
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Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

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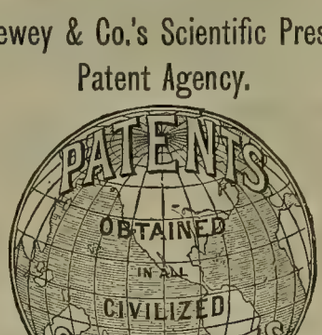
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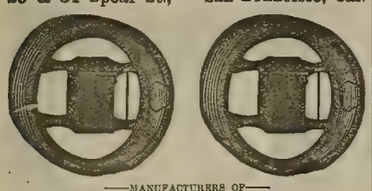
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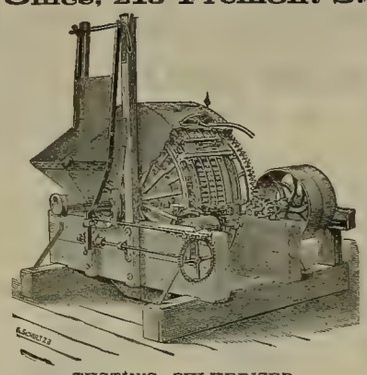
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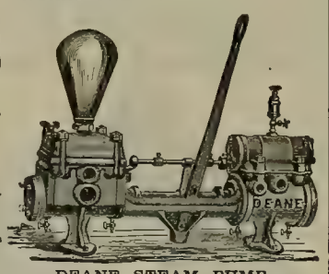
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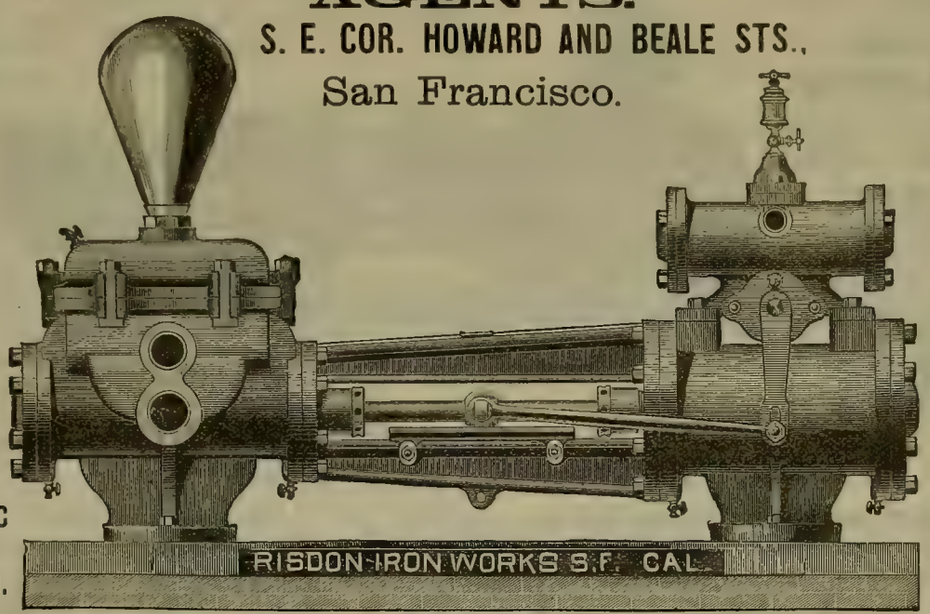
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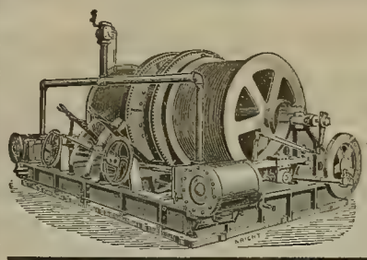
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VOL. LIX Number 16.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, OCTOBER 12, 1889.

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Diamond Mining.

The De Beers consolidated diamond mines, South Africa, made a profit last year of £448,000. The company have paid £5,300,000 for the Kimberley, another adjoining mine, and also own several other claims in the consolidation. They have about 12,000,000 loads of "blue" (diamondiferous earth) in two levels, and altogether have the very finest prospects.

Mr. Gardner F. Williams, well known as an accomplished mining engineer of California, is in charge of these diamond mines as general manager, and is highly esteemed by the company as the right man in the right place. In his last annual report Mr. Williams describes the system of working the mine which he has inaugurated. Plans and sections of the mine are herewith given.

The plan of the 685 foot (or 700) level represents the present system of tunnels. The plan of the 800-foot level represents the system which Mr. Williams has laid out for the future working of the mine. By the latter system a considerable amount of tunneling will be saved and the tramming made less difficult.

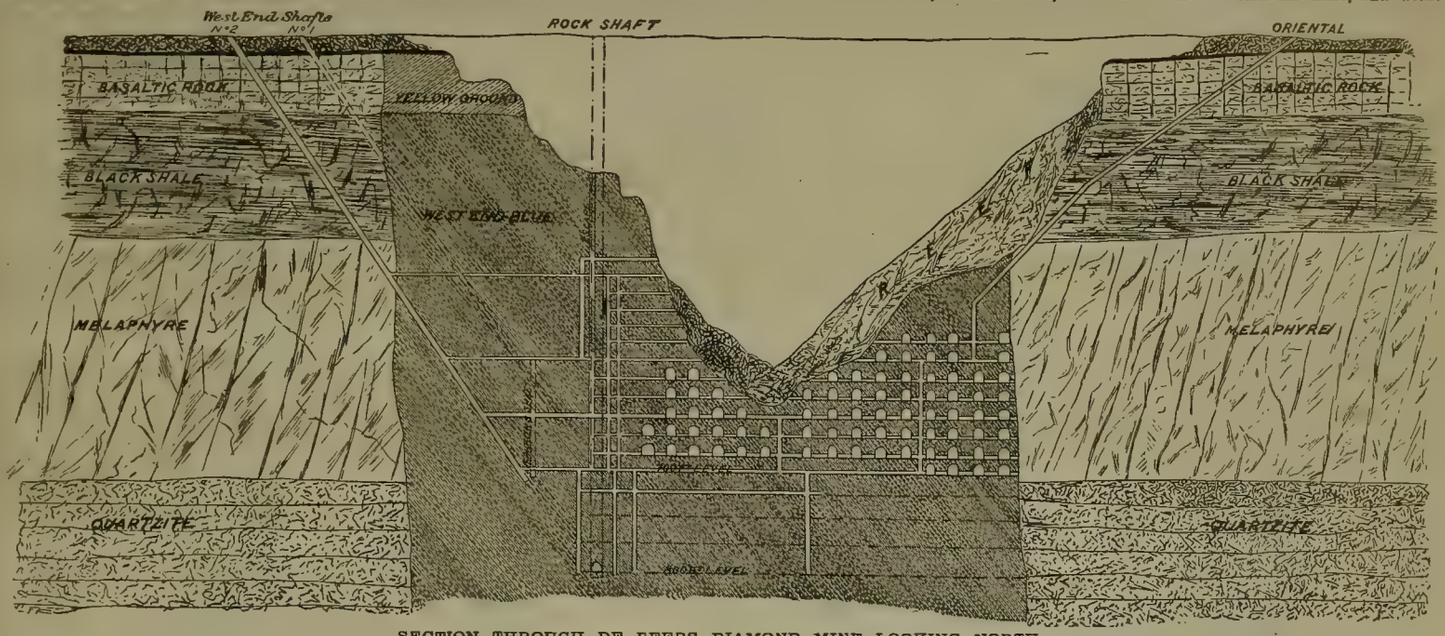
Now that they have opened up levels below that portion of the mine formerly worked by the United and Victoria companies, and which had crushed in, they are able to work more systematically. The system which Mr. Williams has laid out is to work the levels back from the surrounding hard rock, in sections or levels 30 feet apart, forming, as it were, terraces, each upper level being worked back in advance of the one below it.

By this method there can be no danger of a general collapse of the underground works, as all the levels remain solid, with the exception of the tunnels. Only a few galleries at a time will be driven on each level, and the pillars between these will rest upon solid blue below. As they rob out the roof of the galleries and pillars other galleries will be excavated, and thus the work will be carried on until the blue ground on each level has been taken out. As the upper levels are being worked out, new ones will be started below.

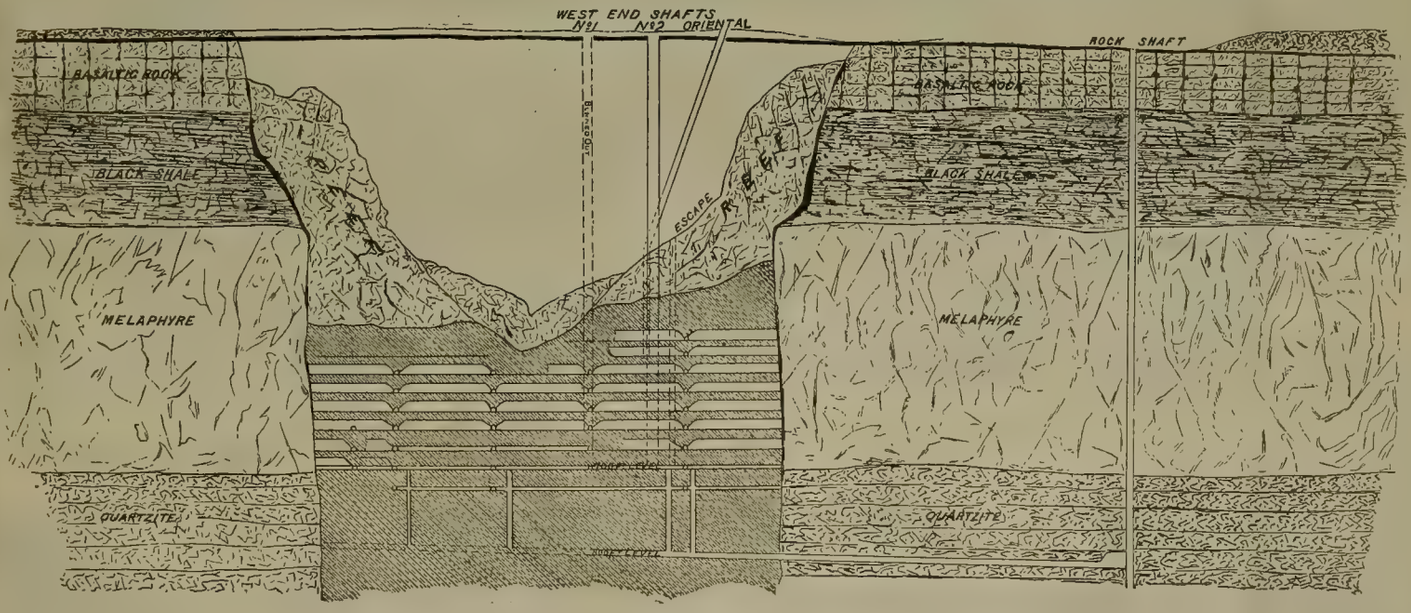
The system of mining now being carried on in the De Beers mine can be continued to any reasonable depth without increasing the cost, except that of hoisting and pumping, which will naturally increase with depth. Many of the ablest mining engineers of Europe and America have visited the mine, and without exception have expressed opinions favorable to the system of work and the permanency of the mine.

The amount of "blue" hauled during the year was 225,658 loads through No. 1 incline, and 719,048 through No. 2 incline. They drove, among other work, 13,954 feet of main tunnels.

(*Continued on page 287.*)



SECTION THROUGH DE BEERS DIAMOND MINE LOOKING NORTH.



SECTION THROUGH DE BEERS DIAMOND MINE LOOKING WEST.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Yuba County.

Working Gravel By Drifting.

EDITORS PRESS:—'Tis but a few years since Yuba county was well and favorably known as a gold-producer, her rich gravel-banks and river-bars turning out over $35,000,000 of the yellow dust. Scarcely had the full measure of her prosperity been attained, when the anti-debris decision came down upon the hydraulic mines of this section and closed the entire enterprise. The miners who had paid Uncle Sam his price for mining lands, and backed their faith in the Government by investing thousands of dollars and years of toil in this speculative business, suddenly found themselves bankrupt, though owning millions. For a time they lived in and on the hope that in some way the matter would be adjusted and the mines be allowed to resume operations; but, as the months went by and the years came on without any measures of relief, they finally abandoned all hope of Government aid and settled down to a belief that gravel mining was doomed.

But man must live, be he a miner or rancher, and in time the "giant" was stored away as a relic of bygone (prosperous) days, and shafts put down to test the average character of the gravel. These showed that the first 60 feet above bedrock ran $2 50 to $30 a car. The cement gravel was crushed in batteries, but the result was not satisfactory, the rusty character of the gold preventing its free amalgamation. In consequence the miners felt that it was useless to battle against fate and endeavored to reconcile themselves to the inevitable. Then Wheaton Bros. and some Marysville people leased some mining ground on a royalty of 20 per cent and tried another process. The cement was crushed in a rock-breaker and then ground, polished and amalgamated in an arastra. By this old-time Mexican method the gravel was made to pay handsomely, though worked by shaft with all the attending expense. By reason of the steel-like character of the diorite bedrock it was found that a bedrock drift could not be run for less than $40 a foot; in consequence the drifts were run about eight feet above the bedrock and the gravel for 60 feet shaped out. About 80 miners are employed at $2.25 a day in supplying the arastras with gravel. When compared with the work of a hydraulic, the contrast is apparent at a glance.

Leaving out the section at Timbuctoo, the ridge at Smartsville is 1½ miles long, with a face of gravel 500 feet high and a thousand wide. On this bank the hydraulic could in one day do more work and produce a greater amount of gold than a thousand men, as the mines are worked at present. The present limited method is meeting with success, and in consequence Smartsville is taking on airs and looking "right smart" over the possibilities of the near future.

Mr. Ayer of Lowell is at this time visiting the section, which leads the miners to believe that they will soon resume operations on an extensive scale on the Excelsior. That this section can produce a large amount of gold for many years to come is evident. That which the hydraulic would have accomplished in a year may take a century to accomplish, and in this way many reap a benefit which with the hydraulic method would have gone to a few.

It is estimated that owing to the rusty and light gold of this deposit, the early miners did not realize over 60 per cent of the gold contents of the gravel. By the present arastra process the loss is almost nothing. Within another year the entire channel will be worked, and where but a few men were employed by the old hydraulic process, hundreds of miners will be needed to sink drift and timber in the mines as at present conducted. In consequence, Smartsville can look forward to a steady advance and a prosperous future.

E. H. SCHAEFFLE.

AN ONYX MINE.—Onyx mining is an industry about to be added to the already long list of the resources of this section. There is a very large ledge—a mountain of it—located about 20 miles northeast of Nipomo in the upper Huasna valley. It is the property of Kesseler Bros. of San Francisco, who are just commencing operations in the way of opening up and developing the mine. A contract for building a wagon-road to the mine has been let, and work will proceed on the same at once. The outlet will be at Arroyo Grande, to which point the stone will be hauled and shipped for San Francisco, to the works of Messrs. Kesseler Bros., for manufacturing into such articles as it is used for. It is said to be a very fine grade, and pieces large enough for mantels and table-tops can be sawed out. The mine is now opened in three different places, two showing white onyx and the other red. We are not advised as to the value of the stone from this particular mine, but the gentlemen handling the property are said to be experienced judges, and they consider it a big thing, owing to the immense quantity and accessibility of the mine. That they are preparing to ship in large lots and going to considerable expense, is sufficient to show that the enterprise is an important one and likely to yield good returns.—*Nipomo* (*San Luis Obispo Co.*) *News.*

The Irrigation Surveys.

Though the Senate Arid Lands Committee has made its flying circuit and is now presumably preparing its review of the situation to be presented at the opening of the next session of Congress, the actual surveys are now going on in Nevada, Utah and Idaho, and will ere long be prosecuted in the more westerly regions of the Pacific Coast. It is possible that some may have thought that the observations and bearings of the Flying Committee would constitute the data upon which these measures for the development of the country would proceed, and some have wondered how such cursory examination could yield any trustworthy conclusions. It is nat ural enough that such apprehensions should arise, and to allay them it is perhaps well to remark that the Visiting Committee only intended to get a few general ideas on the subject upon which they might recommend that the Government devote some of its surplus cash to a systematic investigation of the subject. No doubt they saw enough to warrant them in this and consequently it will not matter particularly if they did not see and hear all that the people wished to present to them. The work of the Flying Committee will serve its purpose, and the full and careful examination by Government experts will follow.

Some idea of the manner in which the work is being done can be obtained from statements made by ex-State Engineer Hall to a reporter of the *Chronicle*. Mr. Hall is supervising engineer of the arid land survey for the Western grand division, which includes the territory west of the Wasatch mountains, divided into five divisions, each in charge of a division engineer. He has just returned from a tour of inspection through the divisions of Nevada, Utah and Idaho, where he has better familiarized himself with the work done and planned and the progress made. In those divisions and in California surveying parties have been in the field for nearly three months. Mr. Hall gives this paragraph concerning the character of the work performed:

"There have been three surveying parties in the field in Nevada—one of five or six men, and part of the time two parties in Utah, and two parties of about 20 men in Idaho. In Utah investigations have been directed toward the study of irrigation as it is now practiced, the gauging of streams and sources of water supply. In Idaho the water supply has been studied on a large scale and preliminary surveys made for its distribution over the valley of the Snake river in the southern and southeastern part of the Territory. This valley is nearly 500 miles long and from 30 to 60 miles wide. All except the extreme upper portion is now an arid waste, but it has a salubrious climate, a fine soil, and irrigation would turn these great desert plains into a teeming country capable of supporting a great population. In the extreme upper end Mormon and other settlers have established small systems of irrigation, but the rest is practically all Government land, which has now been withdrawn from settlement. There are large and undetermined acres which have been covered by lava flows, but there are immense areas of fine soil with a topography favorable to irrigation, comprising probably from 5,000,000 to 7,000,000 acres, now worthless. This could not be redeemed except by the direct action of the Government or by the efforts of a great aggregation of capital. Altogether it is probably the best section of the country for the successful application of the arid lands law. The cost of irrigation works, though very large, would be small compared with the cost in similarly large sections and as compared with the value of the land redeemed."

This particular branch of the work, though large, is of course only part of the whole, but it gives an intimation of what the possibilities of increasing the productive area of the country are. It is a vast work, and, as Mr. Hall says, at the rate of progress made this year, the completion of the surveys would take several years, but of course a force could be put in the field which could complete the work next year. Some definite surveys have been made so far this year, and a preliminary study of the whole field, which will be a basis for intelligent future operations. The showing at the end of the season will be highly encouraging as a whole. Reports in some districts will be disappointing, but in some expectations will be exceeded. The wisdom and practicability of the law will be fully demonstrated.

The rapidity of the progress of this work depends upon the appropriations to be made by the coming Congress. Director Powell of the Geological Survey, who has general charge of the whole matter, will submit estimates of the cost of the work. He will also, we understand, include the examination of soils and waters to determine their fitness for production. This work should always attend the irrigation surveys, and was undoubtedly contemplated in the Act creating the Geological Survey, which provided that its duty should be the classification of the public lands.

This comprehensive and accurate work offers a field for the expenditure of a little of the surplus money now in the Government Treasury, and certainly no wiser use could be made of it. It is simply doing on a large scale what every land-owner does in his own business—that is, using the surplus profits from his good land to reclaim and make productive some waste part which needs improvement to become productive and yield a profit upon the investment in its amelioration. The great West should be a unit on this subject before Congress, for it holds the key of turning our so-called deserts into populous States; and the East should also earnestly approve it, for such improvements will give field for the investment of surplus Eastern capital and for the happy settlement beneath our own flag of the surplus Eastern population. We can conceive of no subject which now better merits generous treatment at the hands of the Government.

Underground in the Granite.

No mine of prominence in the country, says the Phillipsburg *Mail*, has received less mention regarding its underground workings than the mammoth Granite Mountain, which today stands second to none of the great properties in Montana. Through the kindness of Superintendent Weir a *Mail* representative was shown through the wonderful developments in this property during the past week, and to say, after a thorough cruise through its various levels, that the Granite mine is only in its infancy, is not a bold assertion. It is true, and all connected with it most certainly recognize this fact. The ore body is deposited in such a manner that it has proven itself to gain strength with depth. In the 5th level there was an enormous quantity of rich ore taken out, and at a distance of 500 feet in on this level the vein cropped out to the surface. The 6th level showed a still stronger ore body, and cropped out 200 feet farther east than the 5th. The 7th shows a decidedly stronger and richer body than in the levels above mentioned, and they have run east and west on the vein 2300 feet in solid ore. To a casual observer it would appear that there was enough ore in this level alone to supply the mills for years to come, although no ore is being taken from this level at present, but several men are at work in it, putting in chutes and preparing for future operations.

The principal supply for the mills is at present being taken from the 9th and 10th levels. The 9th level is making the best appearance of any yet run in the mine, the ore body being stronger and richer than any previously operated. They are only in a few hundred feet in this level, but from general indications it will prove the richest part of the mine yet explored. Quantities of native silver have already been taken out, and it seems to become more abundant as the work proceeds. Judging from the way the ore body is looking now it will hold out several hundred feet farther than any of the other levels.

The tenth level has been run both east and west many hundred feet, and there yet remains enormous bodies of ore to be mined from it. They have run westward on this vein until they have now almost reached the dividing-line between the Granite and Bi Metallic properties, and that the two companies are working on the same vein remains no longer a doubt. The eleventh and last level in the Granite mine, at a depth of nearly 1000 feet from the surface, has only recently been opened up, and they are now drifting north for the vein under the seventh level west, and it seems that when the vein is reached from this point they will have almost an endless body of ore.

Coming to the surface, the most noticeable improvements have been made within the past few months. The engine-room has been enlarged for the accommodation of the electric dynamo and engine; a new and commodious blacksmith shop has been erected, where they now manufacture their own cars, with the exception of the wheels, which are made at Bowen Bros. & Thompson's Phillipsburg foundry, and they can forge pieces of iron equal in size and otherwise to work of that kind done in St. Louis. A new cage is now being built to take the place of the old one in the shaft, which Mr. Weir does not consider as substantial as he desires it to be. The storeroom is another most attractive place on the grounds. Without seeing it, no one can imagine or scarcely be told what an enormous stock of supplies this company carries to replace any part of the vast machinery that may wear out or be damaged by accident.

Not even the gentlemen who are best acquainted with the Granite mine can conscientiously place an estimate on a term of its future existence, and 20 years would not be considered too long a time for them to work out what can safely be said to be in sight.

FLUMES REMOVED.—The double line of wooden flumes, formerly leading from the California pan-mill to the Omega mill in Sixmile canyon, to convey tailings flowing from the latter, has been removed. The Virginia *Chronicle* says: Each line of these flumes was nearly three miles in length, constructed of two-inch plank, and, with the posts and braces to hold them in place included, contained 500,000 feet of lumber. The tailings that flowed through those flumes into the Omega mill reservoirs contained many millions in bullion, and during the years when the high-grade ore from the first bonanza discovered in the California and Con. Virginia was being crushed at the Sacramento, Mariposa, California and Nevada stamp-mills, there was a continuous stream 20 inches in volume and six miles in length of tailings—fairly blue with the metal they contained—flowing through the two flumes.

Land Office Business for the Year.

It is telegraphed from Washington that the annual report of Acting Commissioner of the General Land Office William M. Stone has been submitted to the Secretary of the Interior. In opening his report Commissioner Stone refers to the accumulation of business in the office which has been left over from former administrations and which was partly due to the increasing work of local land offices. The system in force, he says, was not promotive of a speedy dispatch of business, especially in the case of the Board of Review, created by Commissioner Sparks, which he abolished as a hindrance to good, safe and quick work in the office. Commenting on Mr. Sparks' "unfortunate and unwarranted suspicions that a widespread system of frauds prevailed," and Mr. Sparks' assertion that "the proportion of fraudulent filings to the total number of filings made and relinquished may be estimated in round numbers at 100 per cent," Mr. Stone says: "This wholesale arraignment of claimants on the public domain should not have been made without the most conclusive evidence to sustain it." The report goes on to say that no general misconduct on the part of Western settlers has been found. During the year 1887, 147 agricultural patents were issued, covering 11,791,119 acres of land, an increase over the preceding year of more than 3,000,000 acres. Mineral patents to the number of 913, covering an acreage of 17,096, were issued. There were patented for the benefit of railroads, under the law, 425,046 acres, and under swamp land grants to States, 259,721 acres. State selections under educational grants were approved to the extent of 133,350 acres, and lands to Indians were patented under various Acts to the amount of $158,390.

The total cash receipts of the office from the sales of land and fees were $9,270,225, a decrease of more than $3,000,000 as compared with the previous year. During the year surveys were accepted to the amount of 4,544,372 acres, principally in Dakota, Montana and New Mexico. Commissioner Stone calls attention to certain allowances made to deputy surveyors by the first Comptroller of the Treasury in the years 1886 and 1887, which, in his opinion, was grossly irregular, and a palpable usurpation of the powers and duties specially belonging to the Commissioner of the General Land Office.

The report refers to the unsettled condition of private land claims in New Mexico and Arizona, and the urgent need of Congressional action to settle titles in these Territories.

Referring to the Act of March 3, 1887, which authorizes the Secretary of the Interior to adjust each of the railroad grants, and, if any have been erroneously certified or patented, to commence proceedings to cancel them, the report states that of pending selections 21,660,846 acres have been suspended, awaiting action by Congress.

Attention is called to the fact that more than 80,000,000 acres of land have been claimed under the Swamp Land Act in various States, Florida alone, while having a total area of but 37,031,520 acres, having lists filed for 22,221,469 acres as swamp land.

"There can be no doubt," says the report, "that large quantities of land, amounting to millions of acres, have been patented to States erroneously as swamp lands, when, in fact, they were and are good agricultural lands."

The work of examining ex-parte mineral entries is said to be two and a half years in arrears.

The report recommends that when a homestead or pre-emption claimant receives a patent and mineral is discovered subsequently on his claim, his certificate of entry shall act as a bar to any mining claim upon a discovery made subsequent to entry.

The report recommends the repeal of all laws relating to public timber and the enactment of a general law—plain, concise, and unmistakable in meaning.

Fewer fraudulent entries have been made during the year than for many years past, owing to increased vigilance, but several cases are mentioned in the report where syndicates sought to obtain coal lands by fraudulent means, and in one case, had they succeeded, the commission alone would have amounted to $550,000.

The opening of Oklahoma is referred to as the most important event for several years in the administration of the Land Office.

A MINERAL PALACE.—Following the idea of corn palaces and blue-grass palaces, the city of Pueblo, Colorado, is to have a mineral palace. The framework of the building, after the manner of the other structures named, will be concealed outside and inside with ores of all kinds, mineral specimens, coal, iron, steel and copper. The interior will represent tunnels, drafts, shafts, smelters, etc.

THE Rae metallurgic process of amalgamating ore pulp has been introduced into the Occidental mill. By this and the "Boss" process combined, 90 per cent of the assay value of ore pulp is saved at the California mill.

THE LOST BOOK OF EUCLID FOUND (?)—It is asserted that a Sanskrit translation of the lost book of Euclid has been discovered at Jeypore, India.

California Yachts.

The yachts built for California waters differ somewhat from those in Eastern waters, owing to our climatic conditions. Here we have very rough water and very strong winds during the summer yachting season. Our boats have to be built very "able;" that is, they cannot be shallow "skimming dishes" adapted only for light breezes and smooth waters. Our rigs are small, for we can only carry about two-thirds of the sail area given to Eastern yachts. The light sails and balloon canvas which make the Eastern yachts so picturesque are seldom used here, for we do not need them. In the channel of the bay when the wind comes sweeping in through the Golden Gate, it blows from 25 to 35 miles an hour nearly every afternoon in summer.

To stand such winds and attendant sea we give our California yachts a good depth and good beam. There are few keel yachts, most of them having center-boards, for the waters in the upper and lower bays are shallow. The largest yachts have lead keels, adapting them for ocean cruising. But there are few convenient harbors along the coast, so that most of the yachting is done in the bay.

The illustration on this page is a photo-facsimile of a large center-board schooner-yacht just starting across channel. It is a spirited picture, taken from a good position, and shows the type of craft most in use in these waters.



ON THE BAY OF SAN FRANCISCO.

SEMI-SUBTERRANEAN RIVERS.—We have in Nevada several rivers that sink and then rise again—as the Reese—and some that flow underground long distances after ceasing to flow on the surface. Arizona and New Mexico also have several such streams, but in some countries the rivers have a vegetable covering instead of one of earth or rock. Captain John Page of the Argentine Navy mentions that the Upper Paraguay, as if absolutely lost for many miles, has been known to flow beneath a matted covering of living and dead vegetation several feet in depth. In the year 1858 one of these growths, under the influence of an extraordinary inundation, broke loose and drifted 2000 miles, bringing up at Buenos Ayres, with many animals and reptiles that had taken refuge upon it.—*Virginia Enterprise.*

THE industry of making paper from cottonwood pulp is rapidly becoming one of the leading manufacturing interests of East Portland, the logs being rafted down the Willamette river to the mill.

THE asbestos deposit at Pigeon mountain, San Diego county, is difficult of access, being at the edge of the Colorado desert. The company operating this deposit also own the mine at Elsinore, the two deposits being very dissimilar in their character. That of the former is known as the long-fibered variety, and is used in the manufacture of roofing, pipe and boiler covering, etc., while the Elsinore product is a short-fiber article, possessing peculiar properties which make it valuable in working up into paint, readily combining with the pigments that form the component parts of this article of trade. Asbestos paint, a strictly fire-proof coating, is very extensively used, especially in the West; protracted drouths render all woodwork exceedingly dry and susceptible to fire. The company, of which J. D. Hoff is the manager, have a valuable plant at Pacific beach, where they are turning out large quantities of the paint.

FREDERICK M. JOHNSON of San Francisco, says the Rogue River *Courier*, has secured a franchise to supply Grants Pass, in Josephine county, Southern Oregon, with a fifty electric-light arc plant to light the town and supply the city with water for drinking purposes and power for machinery.

AS S. ALSOP & SONS were boring a 7-inch well on a lot belonging to D Coy in the southwestern suburbs of Salinas, they struck a vein of natural gas at a depth of 81 feet. The gas was ignited and has been burning with a rushing, roaring sound ever since, the flame extending eight or ten feet from the top of the pipe. In boring the well, the first ten feet was through adobe and sand; then 56 feet of blue slush; then 16 feet of dark-colored gritty clay; then 18 inches of gravel in which the gas was struck. The pressure must be quite strong, as the gas is forced through 60 feet of water and mud before it reaches the surface.

THE *Century* has in preparation a series of papers on topics relating to "The Gold-Hunters of California." The articles will be prepared for the most part, as were the war papers, by prominent participants in the events which they describe. A careful search in California and elsewhere has already brought to light many interesting pictures never yet engraved.

FIR TIMBER is looking up. The tests required by the Northern Pacific railroad prove it to be stronger than oak. Users of dimension timber may go farther and fare worse.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

AMADOR.—*Ledger*, Oct. 5: At the Amador gold mine the west drift at the 550-foot level has struck the ledge. A strong flow of water was the immediate result, too much in fact for the small pump in the shaft to handle. They have suspended operations in this direction for a few days, when the water is expected to diminish. About 80 men, all told, are employed about the mine. W. T. Robinson has returned to Amador county to stay. He intends to devote himself to mining on the Mokelumne river. The engine shaft at the Zeile mine broke Sunday morning, and it took until Wednesday to repair it, nearly all the miners being laid off in the meantime.

DRYTOWN.—Amador *Dispatch*, Oct 5: Sinking at the Drytown Consolidated is making good headway, averaging about 10 feet per week. A ledge 18 feet thick is in the bottom of the shaft, and is getting wider as the shaft goes down. Cosmopolitan is running along in its usual quiet manner, making preparations to furnish rock to the mill when completed. The mill is getting along very slow, owing to the fact that there are only four mechanics at work. At the Reeves mine, lumber is being delivered for an additional 10 stamps.

Butte.

THE PERSHBAKER MINE.—Oroville *Mercury*, Oct. 5: On the 15th of last May papers in an action entitled Wm. Singer, Jr., vs. N. D. Rideout, A. Abbott and Albert M. Johnson, were filed in the office of the County Clerk in Oroville. The complaint set forth facts stating that plaintiff held a vendor's lien of $10,000 against the Pershbaker mine, of which defendants are owners. The suit hung fire until Sept. 28th, when it was finally dismissed by the filing of a "Precipe for Dismissal" on that date with the clerk. The opinion is expressed by men who are conversant with facts concerning the mine that this last move shows conclusively that misunderstandings between litigants have been settled, and that matters will soon be adjusted upon a working basis. One or two suits are still pending in our court against the mine claimants, and while they are important in themselves, are not considered sufficient to prevent resuming the gold search. The Pershbaker mine is rich in the precious metal, and if work is resumed again in the old claim, times will liven up on Magalia ridge.

Calaveras.

BRYANT.—Amador *Dispatch*, Oct. 5: Col. W. T. Robinson returned from San Francisco last Saturday night. He says he is now prepared to resume work on the Bryant mine, near Middle Bar, and thinks he will in a short time also resume work on the Cleveland mine. The Bryant mine is located just across the river in Calaveras county, while the Cleveland mine is on this side of the river. The Col. seems to be confident that both these mines will prove to be good paying pieces of property as soon as they can be thoroughly developed.

DRIFTING.—Angels *Record*, Oct. 2: Sam Wood has several men at work upon a claim a short distance from the Old Right Borrer mine at Indian creek. His aim is, if possible, to strike the pay chute on the west side of the old claim. A shaft has been sunk and the miners are drifting in hopes of making the discovery. If they find the original strata, and it keeps up to its standard for richness, we will no doubt be enabled to herald the discovery of an uncommonly rich mine.

Mariposa.

SCHROEDER MINE.—Mariposa *Gazette*, Oct. 5: Capt. Diltz is ardently engaged with the new road which he has planned to extend from his mine to the Merced river, at his mill-site, passing by the Buena Vista and Schroeder mines. The Captain has nearly completed the road as far as the Buena Vista. From that point to the Schroeder mine he proposes to make use largely of the road, such as it is, which Mr. Schroeder now uses. With some alterations and improvement in the grade and direction, avoiding the steep hills, the Captain expects to reach the Schroeder mine.

Mono.

GREEN CREEK DISTRICT.—Bridgeport *Chronicle-Union*, Oct. 2: The locators of mining claims on Green creek held a meeting agreeably with a posted notice, for the purpose of organizing a mining district. The district is bounded as follows: Commencing at a place on Virginia creek, Mono county, California, commonly known as the crossing of said creek, between Dogtown creek and the Old Mono Diggings, and running thence in a northwesterly direction to what is commonly known as the place where Tinkum's sawmill stood, on Robinson creek, below the Twin lakes; thence through the Twin lakes and up the channel of the Twin lakes creek to the summit of the Sierra Nevada mountains; thence in a southeasterly course along the summit of the mountains to a place near the headwaters of Virginia creek, where the Virginia creek trail crosses the said summit; thence in an easterly course along said trail to the middle of the waters of said Virginia creek, and thence down the middle of the channel of said creek to the place of beginning. A large number of locations have been made, and all who have visited the district believe there is a bright future for it at no distant day. Very good ores, assaying into the hundreds, are daily brought to town, or sent to the assayer at Bodie, and the district is attracting attention.

Napa.

THE KENTUCK MINE. — *Calistogian*, Oct. 2: Lumber, supplies, etc., for use at the Kentuck quicksilver mine in Cinnabar district, the coming winter, are being taken there from Calistoga. The company has finally decided upon a course to pursue in reopening the mine. First, excavations were made in the old tunnel, but it was found to be too badly caved and work was stopped. Then a new incline was started at the side of the old one, but work was discontinued there and the old incline was reopened several feet—down to where plenty of cinnabar was in sight, but the incline caved badly and it also has been abandoned. Last week work was commenced on a shaft through which the mine will be opened and worked. It will be continued down to where the ore is now known to be, a distance of 65 feet. A furnace—contrary to the old methods employed at quicksilver claims years ago—will not be constructed at the mine until the owners know more about the amount of cinnabar that can be obtained there. But to assist in defraying the expenses of development, two retorts will be taken to the mine and kept in operation. About one and a quarter tons of ore can be run through the two in 24 hours, and the product will amount to a fair sum monthly, as the ore shows itself to be of very high grade.

Nevada.

MINING AN OLD MILLSITE.—*Transcript*, Oct. 3: Charles Adolph and Will Hart, who recently made $210 apiece in seven days working over the ground where Keith's custom quartz-mill used to stand, have obtained the privilege of working the site occupied by the Deadwood ten-stamp mill in Willow valley up to the time the building was burned down last year. The mill was constructed in 1856, and had been pounding away on quartz a good share of the time it was in existence. There is of course reason to believe that more or less gold was lost from the batteries, and Adolph and his partner will be disappointed if they do not recover a lot of it.

STRUCK THE BLUE LEAD.—At the San Jose mine near the Central House between this city and Washington, the long-sought-for blue gravel lead was struck on Tuesday last. There can be no mistake about it, according to Mr. Spencer, president of the company, who came down Thursday from the mine. The gravel is rich in coarse gold. Tens of thousands of dollars in money and several years of hard labor have been expended in prospecting the claim. The discovery will make a boom in gravel mining up there. It is in the same neighborhood as the Centennial claim, which is being prospected by State of Nevada men.

WILL RUN THE TUNNEL.—It has been decided as a result of the visit that President James, Supt. Richards and Wm. Davis paid this week to the Centennial drift mine between here and Washington, to run a prospecting tunnel into the ridge, beginning at a point near the Nevada City and Washington road, and about a mile southwest of the present hoisting works. Work will begin without delay.

WASHINGTON DISTRICT.—Cor. Nevada *Transcript:* Washington is a lively burg. Many men pass through it up and down, to and from the mines on the river above. The mines are well worth seeing, if but to show in what a forbidding-looking country good gold-bearing quartz may be found. The Diamond D — formerly the Eagle Bird—has many men now working on top, busy cutting out lumber, carrying it over a mile on their shoulders and using it in the repair of their flume, which hangs like an air line, seemingly across the face of the winding cliffs. The sills are being doubled by alternating every old sill with a new one. To do the work, carpenters must hang suspended in slings mid-air. Farther up the Meadow Lake ledges and their intractable ores are being experimented on from time to time. This part of the county now offers great inducements to prospectors. Some veins that were almost barren on the croppings have turned out handsomely on the dip. For example, the Yuba mine betters itself as it goes down.

Placer.

REVIVAL AT OPHIR.—Placer *Herald*, Oct. 5: The mining situation in the Ophir district is improving daily. Residents say the prospect has not been so encouraging for years, and predict lively times in the old camp. The district has been from the early days noted for its rich quartz mines. The chief reason why capitalists have been shy of investing there for the last ten years or more has been the lack of confidence, begotten of former failures. During the last year confidence has been gradually growing through the successful working of the Hathaway mine by the Valentines, the success of Charlie Reed in the St. Lawrence, the continued good pay in the Moore mine belonging to the White boys, and the late rich strike of A. Shurtleff in the Crater. Mr. Shurtleff has taken out $500 rock, but no excitement followed and nobody seemed much surprised simply because it was in Ophir, where the same thing had happened scores of times before. The Crater is an old mine. It has just the same history that neighboring mines have. It has been abandoned time and again, and now Mr. Shurtleff has taken hold of it and has found richer rock than its former owners ever dreamed it possessed. The Bellevue is another mine that has a history similar to that of the Crater. It is one of the oldest mines, having been located in 1855 and known at that time as the Union Co. mine. W. Pellow has owned the mine for quite a number of years and has taken out considerable money at times. During this last winter he bonded it to J. McCaw and N. Curtis, experienced and practical miners. Mr. McCaw began work in May by sinking a shaft. They have since sunk four other shafts 70 feet in depth. The work of cleaning out the old slope has been under way for several weeks. Everything has been made secure to the water level. This slope is 280 feet deep and is filled with water to within 70 feet of the surface. They are preparing to hoist. The boiler is in position, and a pump with a capacity of 6000 gallons an hour is on the ground. The hoisting works will be in working order by next Monday. Charley Reed is quietly working away in the St. Lawrence. This is another old mine. He came into ownership in 1886. Since then he has sunk five shafts besides starting two tunnels, the second being the working tunnel and is 350 feet in length. This tunnel follows a stringer in the footwall for a distance of 160 feet to a point where another stringer came in from the northeast. These two stringers continue, the one above the other, to the end of the tunnel. They are gradually approaching each other and probably will become one a few feet ahead, judging from the indications. These stringers or ledges are from eight inches to a foot in thickness, and at the head of the tunnel are separated by a layer of syenite a foot in thickness. Mr. Reed has now uncovered and ready for taking up an area about 40 feet square of the lower ledge which reaches in a solid sheet down to the floor of the tunnel, and is inclined at an angle of about 33 degrees. He will soon begin to take it up and will follow the ledge to the surface, which is about 175 feet above. He is now working the upper ledge. The quartz is arranged in layers and is known as "ribbon" rock. For the last 160 feet the lower ledge has been very rich, the assorted rock paying $200 per ton and the common rock yielding from $20 to $25 per ton. The ore is hard and contains iron and galena sulphurets. These sulphurets are sent to the Oakland smelting works. He will build a mill at the mouth of the tunnel and thus save the cost of hauling.

RICH GRAVEL.—Placer *Republican*, Oct. 3: The May Flower miners have found both the north and south veins of the Orono channel, which shows that it comes in from the east. The gravel is proving very rich. A trial crushing of 64 tons just made resulted in $7.62 a ton.

Plumas.

WEST ELIZABETH MINE.—Greenville *Bulletin*, Oct. 2: From Mr. Kerr, once a resident of this place, who, with Mr. Miller, was here from Johnsville last Saturday, we learn that the West Elizabeth M. Co. is developing a very important property about six miles from Johnsville, between Poplar and Nelson creeks. The work on this property under the quiet but able superintendency of Mr. W. J. White, has been prosecuted for the past four years. First at an elevation of over 6000 feet, a tunnel 625 feet long was run. Striking sediment and pipe clay in this, a second tunnel was begun, 150 feet lower down. This has been run into the ridge 1250 feet. A few days ago, a raise of 47 feet was completed, tapping a large ancient channel. Mr. Miller says he is yet on the rim, the bed being five feet lower than at the point where the channel was tapped. The gravel yields good pay, and the gold shown us indicates that the mine will yield $20 to the car of gravel. The face of the tunnel is under a lava cap about 400 feet thick. The company owns four claims, which cover between three and four miles of the channel which can be successfully opened at three points. It makes a large proposition, and one that will doubtless yield large profits to the owners, if they go ahead and open up the property as it should be. It is claimed that this development opens up a new field of mining in that locality. It has been asserted that such channels do not exist at an elevation of 6000 feet, but this development proves to the contrary. Doubtless this ancient riverbed will be traced many miles, and numerous good gravel mines developed on its line. The work done thus far has been very successfully directed by Mr. Miller, and it is of a very substantial character. He is the right man in the right place.

Sierra.

WIDE AWAKE. — *Mountain Messenger*, Oct. 5: Wm. and Fred Bosch were in from the Wide Awake mine last Monday and report the new tunnel in 380 feet, and that 200 feet more will end the contract. It is expected that the company will then be in pay gravel.

LOGANVILLE.—H. P. Parker, from Loganville, reports the water all out of the mine down to the 400-foot level, and will begin taking out ore in a few days, no mishap preventing.

GRAVEL.—Sandy Kenn has sunk a shaft back of his house and is taking out gravel. There seems to be a large body of gravel that is expected to pay well for working. It was about 30 feet to bedrock. He is now drifting in new ground and ought to get considerable gold, as the ground under the town paid well in early days.

SIERRA CITY.—The rock taken from the Chipps mine to the Marguerite mill is panning out well. The Buttes Saddle Back Co. is still packing rock to the Kentucky mill. They are giving the mill a good overhauling. The Buttes mine has closed down all below No. 3.

Shasta.

OLD DIGGINGS DISTRICT.—Redding *Free Press*, Oct. 5: R. G. Hart and R. G. Hart Jr. have returned from Sacramento and are again conducting the destinies of the Texas mine, which is developing into a valuable piece of property. There are now three quartz-mills running in the Old Diggings, which is more than ever before. Developments of a startling nature may be expected soon—discoveries that will astonish the natives. Walker Bros.' new mill is about complete, and will soon be in operation. It is one of the finest mills on the Pacific Coast. The rock-breaker is a 9x15 Blake, 150 tons capacity in 24 hours, and is run by a special engine.

SOLD.—Redding *Free Press*, Oct. 5: It is reported that two young men recently sold a mine near Delta for $15,000. Dr. Walk has a location near the one sold from which he expects great things.

OAK RUN.—Wm. Morley sent us some quartz from Oak Run this week that contains free gold. He has no doubt a valuable mine.

SILVER.—We saw ten bricks of silver bullion, valued at $7000, piled up on the sidewalk in front of the Bank of Shasta County Thursday, the product of the silver mine on Iron mountain. Another lot will come in on Monday, when it will all be shipped to S. F.

NEW RIVER.—All the mines in New River, save the Ridgeway, have shut down for the winter. The Ridgeway is owned by a Co. which is able to prosecute work under the disadvantages imposed by winter, if necessary, and is perhaps the only Co. in the district so equipped. Most of the other companies are working leased properties.

OLD DIGGINGS.—Frank Panter, Lawrence Garrecht and Young, owners of the Mammoth mine at Old Diggings, are a happy trio. Tuesday night, after letting off a blast, they picked up chunks of quartz glistening with free gold—very rich. The ledge is five feet wide and 275 feet under ground. This mine is located near the Central, and the discovery will greatly add to the value of both properties.

COAL.—H. H. Briggs of Redding has located a promising coal mine between Clover and Dry Clover creeks, and has bought 160 acres of land, on which the mine is located, from Mrs. Webb of Millville at $4.50 per acre. A. W. Norton of the Napa tannery is interested with him, and Fred H. Deakin and E. Frisbie have a location near by. Briggs has partially developed his ledge, and experts claim that the coal will make 80 per cent gas.

GOLD.—J. W. Armstrong has made a curious yet valuable discovery of mineral-bearing rock near the mouth of Sulphur creek, near Reid's ferry. At this place a precipitous hill juts out which can plainly be seen from Redding. Mr. Armstrong was descending from the hill not many days ago when he slipped, and to save himself from falling he caught hold of a ledge of rock, which giving way so easily excited his suspicion, and looking at the piece remaining in his hand, he discovered that it was well sprinkled with gold. An assay was made which went as high as $80 to the ton. Armstrong, B. Jones and a gentleman named Jennings are interested in the find, and the Ottawa Reduction Works have on hand two wagon-loads which they will test. The rock, if rock it be, is very rotten in character, and does not in any way resemble gold-bearing quartz.

NEW MILL.—Shasta *Democrat*, Oct. 2: The Walker Bros.' new mill on the river opposite Copley will start up this week. It is said to be one of the best milling plants in the county. Harrison Fox and son have struck a rich prospect near French Gulch. The Trinity *Journal* says the new find bids fair to develop into a good property.

NORTH STAR.—Considerable machinery has been shipped from here lately for the North Star mill, which is to be erected by the North Star Mining Co. on East Fork, Trinity county. Frank Young and partner, of the Mammoth mine, Old Diggings, are driving ahead with their lower tunnel which is in 16 feet of ore. In its present stage of development there is an immense body of ore in sight. A half dozen or more mining men, representing foreign capital, have been in and out of Redding the past week or ten days, all of whom seem to take considerable interest in the mines of this county.

Tuolumne.

A RICH MINE.—Tuolumne *Independent*, Oct. 5: If rumor is correct, and we have no reason to doubt it in this case, Messrs. Frank McCann and John Summers have struck a very rich mine. The mine is situated above Summersville, and what was once a 20-inch vein has developed until it now measures from five to seven feet, the rock of which shows free gold and plenty of it.

SUMMERSVILLE ITEMS.—The New Albany mine, formerly owned by Dr. Walker of Sonora, has been sold to a San Francisco company for the rumored sum of $30,000. Mr. W. G. Whorf is superintendent, and Mr. Whitto of Sonora is foreman. Under their supervision a full force of men is pushing the work forward with great diligence, and everything has entered on a flourishing condition. In connection with the mine, the company is making extensive preparations for a new boarding-house, sleeping apartments, etc. Messrs. Long and Gibbs have taken their departure for the Pinenut mine, situated on Turnback creek.

NEW ALBANY.—*Union Democrat*, Oct. 5: The new owners of the New Albany mine have gone into possession and are making arrangements to work it on a large scale—such as the well-established character of the mine deserves. We understand that the purchasers are ex-Gov. Perkins, Capt. McDonald and Millen Griffith of San Francisco. It is in charge of Mr. Whorf as supt. The present condition of the mine is most satisfactory and justifies the firm opinion always held as to its merits by its late owner, Dr. John Walker. The vein on the chute in the north end of the mine is some 15 feet in width and of high-grade ore.

HYDE.—Heavy pumping steam machinery is now being put on this mine by the new owners who lately purchased the property. The main working shaft is to be carried down and the mine prospected by levels. The machinery has capacity for 1000 feet in depth.

KANAKA.—This mine, near Groveland, has been sold to New York parties. It was brought to their attention and reported on by Mr. Louis Blanding. There are several mines in the county now under inspection for purchase, and the indications are that they will all be taken by strong parties and active operations soon started on them.

NEVADA.

Washoe District.

UTAH.—Virginia *Chronicle*, Oct. 5: During the week extracted and milled 320 tons of ore showing an average assay value of $17.20 per ton. Bullion valued at $6172 shipped to Carson Mint. Concentrates on hand valued at $7000.

NORTH OCCIDENTAL. — Continue stoping ore from the 450 level.

SIERRA NEVADA.—On the 520 level from the main east drift, 1185 feet from the shaft station, a south drift is advanced 229 feet. Formation, porphyry with some water.

UNION CON.—On the 1465 level the north lateral drift is advanced 471 feet from the south line, continuing in porphyry and clay.

MEXICAN.—On the 1465 level the north drift from west crosscut No. 1, 200 feet in from the lateral drift, is advanced 444 feet, continuing in porphyry and lines of quartz with some water.

OPHIR.—On the 1300 level the east crosscut from the shaft station, to connect with the top of the raise above the 1465 level east drift, is extended 172 feet, face continuing in porphyry showing streaks and lines of quartz.

CON. CAL. & VA.—The usual quantity and grade of ore is being extracted from the various openings on the 1400, 1435, 1500, 1600, 1650 and 1950 levels. Continue to stope ore of good quality from the point of connection between the northeast drift from the top of upraise No. 2 above the 1600 level. On the 1600 level continue to extract ore from ground bordering the south drift from the Ophir line on the sill floor. On the 1650 level: The stopes on the 7th and 11th floors above this level continue to yield the usual quantity of ore of fair quality. During the week 1085 tons and 250 pounds of ore were shipped to the Morgan mill, 1314 tons to the California. The average assay value of all the ore worked at these mills during the week, according to battery samples, was $26.50. Shipped during the week bullion valued at $59,582.85 to the Carson Mint. Bullion valued at $111,111.57 shipped to San Francisco.

BEST & BELCHER.—On the 550 level, west crosscut No. 1 is extended 37 feet. Formation, porphyry and clay with streaks of quartz. On the 1000 level the northwest drift is extended 305 feet. Formation, porphyry.

GOULD & CURRY.—On the 300 level all work during the past week has been on repairs. On the 400 level west crosscut No. 1 is extended 370 feet. Formation, soft porphyry with streaks of quartz.

EAST SIERRA NEVADA.—The 520 level south drift is out 90 feet and continues in porphyry.

ANDES.—Quartz is still showing in 350 level explorations.

SCORPION.—The 520 level south drift is showing porphyry and quartz.

SAVAGE.—Continue to extract ore of good quality from the 500 level. The south drift from the Gould and Curry to connect with the Savage north drift is advanced 60 feet.

HALE & NORCROSS.—West crosscut No. 1 on the 300 level has entered vein porphyry. No. 3 continues in hard quartz assaying from $7 to $10 per ton. Driving south on the 1200 level.

NORTH GOULD & CURRY AND EAST BEST &

BELCHER.—The northwest drift to connect with the North Gould & Curry workings is out 35 feet, and yesterday entered fine-looking quartz.

POTOSI.—The 850 level south drift has entered a hard porphyritic formation.

IMPERIAL.—An east drift from the winze bottom below the 300 level to connect with the Imperial shaft is out 50 feet. The west crosscut continues in low-grade quartz.

ALPHA.—The 500 level west crosscut shows seams of low-grade quartz. The shaft is down 70 feet below the 500 level.

CONFIDENCE AND CHALLENGE.—The joint Imperial 500 level west drift is out 690 feet from the Yellow Jacket shaft.

YELLOW JACKET.—The 500 level west drift is out 690 feet. Daily ore shipments average 50 tons.

OVERMAN.—The south drift from the winze bottom is out 65 feet, the face in clay and quartz carrying fair-grade ore. The incline raise is up 85 feet and continues to show quartz and porphyry in the top.

CROWN POINT.—The 700 level south drift is out 275 feet, the face in porphyry. Drifting north from the 600 level east drift. Cleaning out the winze below the 900 level north drift. The 1000 level southeast drift is opened 225 feet.

BELCHER.—No. 1 east crosscut from the winze bottom on the 1200 level continues in low-grade quartz. The 200 level west crosscut continues in porphyry and clay. The 1000 level west crosscut is in low-grade quartz.

SEG. BELCHER.—The 1100 level east crosscut is in 290 feet, and is still in low-grade quartz.

SILVER HILL.—The 160 level northeast crosscut has entered quartz and porphyry.

CALEDONIA.—West crosscut No. 2 is in 32 feet, and continues in porphyry.

JUSTICE.—Crushed 224 tons of ore assaying about $26.18 per ton. Stopes looking well.

ALTA.—Crushed 319 tons of ore, assays showing a value of $29 per ton.

NEW YORK CON.—The raise above the 800 level west crosscut continues in ore.

Columbus District.

A POSSIBLE REVIVAL.—Inyo *Independent*, Oct. 5: There is good prospect for a big revival of business at Candelaria. The English Co. which own the water works and a 30-stamp mill, are negotiating for the purchase of the Holmes mining property. There is strong probability that the sale will be made, and if it is the camp will boom again. Candelaria is far from being a dull camp; as it is, about 170 miners are now employed there, and that means a good deal of business.

Osceola District.

THE PLACERS.—Cor. Nevada *Transcript*, Oct. 4: Osceola is in the eastern part of White Pine county, Nevada, and situated on the western slope of a range of mountains which divide Snake river from Spring Valley, fronting on Spring Valley, and at an elevation of 1200 feet above the bed of the valley. The Osceola gravel mine is situated about one mile below the town. It empties into Spring Valley and dumps at an elevation of about 300 feet above the valley level. The owners of the mine have been fortunately foreseeing enough to have entered and obtained a patent for a large extent of this valley as desert land, for dumping purposes. The mine is worked by the hydraulic process under superintendency of J. H. Marriott, a native of Nevada City. It is indeed a valuable piece of property, as the gold is certainly here, and the owners are on the eve of reaping a good harvest. Our monitor is one of Hoskins' 15-inch, with a seven-inch nozzle in use, owing to the scarcity of water. Up to the present time they have had only about 500 inches of running water in the best time of the season, but by the aid of a reservoir they manage to have a stream for the monitor, at this date, for about two hours each day. The ground is very rocky and was evidently an old river channel. The gold is coarse and of fine quality. The company are now employing about 40 men in constructing a ditch which they confidently expect will furnish some 2000 inches of water during the general water season, and sufficient to keep the mine running from nine to ten months in the year. The ditch will be about 16 miles long, four feet on the bottom, six and one-half feet on top, and two and one-half feet deep. There will be about five miles of flume. The ditch and flume will vary in grade from 16 to 30 feet to the mile, as the very rough country over which it passes may necessitate. Some three miles of the ditch are completed. The flume will be of a very substantial character—about the same as the flume of the Milton company's ditch.

Pioche District.

ANOTHER STRIKE.—Pioche *Record*, Oct. 2: On Thursday the Black ledge was struck on the tenth level of the Raymond & Ely mine, at a point about 1000 feet from the shaft. When the Black ledge was entered on the twelfth level, as reported two weeks ago, its strike was noted, and a drift was immediately started on the tenth level, at the crosshead, which it was estimated would cut the ledge after running about 40 feet. Half that distance only was run when the ledge was found. The dimensions of the ledge at this point are not yet determined. A good quality of ore was taken out which can be easily smelted after roasting.

Safford District.

WORK RESUMED. — Eureka *Sentinel*, Oct. 5: Work is being resumed in Safford mining district near Palisade. A carload of machinery for hoisting works for the Onondaga mine in that district was received a few days ago.

Tuscarora District.

NAVAJO.—*Times-Review*, Oct. 5: The crosscut on the 350-foot level extended 12 feet; total length, 121 feet. The upraise, south end of the 350-foot level, extended 8 feet.

NORTH COMMONWEALTH.—Joint crosscut, 225-foot level, extended 16 feet; the face continues without material change. Main south drift, 100-foot level, extended 15 feet; total length, 195 feet.

NORTH BELLE ISLE.—The shaft has been sunk and timbered 14 feet; total depth below the 400-foot level, 135 feet. The bottom is in very hard black porphyry. Water flow about the same.

BELLE ISLE.—North drift, 250-foot level, has been extended 5 feet; total length, 100 feet. Work at that point has been suspended for the present. The main west crosscut has been started up and advanced 5 feet.

DEL MONTE.—West crosscut No. 2, 100-foot level, extended 12 feet in vein; total, 20 feet. Opposite this crosscut, No. 2 east crosscut has been started; the face shows high-grade ore.

GRAND PRIZE.—The 500-foot level and station is being retimbered where necessary, and being put in shape generally. Mine boilers are now undergoing repairs. Development work will be started during the coming week on the 400 and 500 foot levels. Water is below the last-mentioned level, and being held there easily. Work on the concentrator is progressing favorably.

COMMONWEALTH.—An upraise has been made near the face of the north drift, 100-foot level, 225 feet north of shaft, exposing high-grade ore. East crosscut from north drift is in 17 feet, showing fine ore the entire distance. South drift from No. 15 chute has been advanced 10 feet, following good ore.

Union District.

THE ARIZONA MINE.—*Silver State*, Oct. 5: Reports from Unionville are to the effect that a 10-inch streak of black sulphuret of silver has been cut in the Arizona works on the south side of the mountain. Black sulphuret ore predominated in the Arizona in its palmy days, and there is no known reason why the mine should not come to the front again.

Wild Rose District.

CONCENTRATED ORE.—*Silver State* Oct. 7: The Paradise Valley Co.'s team arrived yesterday with 18,000 pounds of concentrated ore. The mill is now running day and night on ore that assays between $50 and $60 per ton from the battery.

Winnemucca District.

STRUCK SULPHURET ORE.—*Silver State*, Oct. 7: A small vein of sulphuret ore, which assays over $20 per ton, has been cut in the tunnel of the Winnemucca Mining Co., and the prospects for striking a larger vein are said to be excellent. Three veins which carry carbonate and chloride ores have been cut in the mine.

ARIZONA.

BLACK HORSE.—Arizona *Journal-Miner*, Oct. 3: Among the bullion-producing mines, or mines from which lots of good shipping ore has been taken, but about which very little has been said, is the Black Horse mine, in Hassayampa district, owned by W. T. Richardson and Charles Wallace. The property is opened up by three shafts, the main one of which is down to a depth of 70 feet. Another one has been sunk 20 feet, and a third 30 feet, all being on the ledge and in good ore. A 10-ton lot of the ore, worked at Cartmell's mill on Groom creek, a few years ago, netted the owners $1052, although the arrangements for saving the precious metal to any high percentage were very imperfect. The last ore taken from the mine was shipped to Pueblo, Col., for treatment and gave a return of $253 per ton. The ore that has been taken from the mine has more than paid for the development work done, and all the stoping that has been done is a block 28 feet in length by 20 feet high. The mine is located in a forest of pine trees, so that wood, as well as water, is in abundance right at the property. There is also in connection with it a good five-room house, shop, etc., in the way of improvements.

GOLD.—Prescott *Courier*, Oct. 2: Ed. I. Johnson and H. Waterman have lots of gold in a ledge, situated between Walnut Grove and Weaver. They took out nuggets worth $75 in a short time and had a sack full of free gold ore, worth in the neighborhood of $500. Silver King shaft, Groom creek district, is about 96 feet deep; ledge, 2½ feet thick; ore increasing in richness. This mine belongs to the Kansas City M. & M. Co. The president, Mr. Smith, will return here to-morrow. Col. Boaz selected this mine for the company. The Waco mine, Walker district, will now be worked by two shifts of miners. It is close to the Dixie mill. John S. Jones said, yesterday, that he would shortly start the Standard mill, Groom Creek. Jacob Henkle, owner of the Rapid Transit mine, Bradshaw district, has a 400-foot tunnel in that fine vein and intends to make it 800 feet before quitting. News of Johnson & Waterman's strike created quite a stir at Walnut Grove and Weaver.

COLORADO.

ASPEN.—Cor. Denver *Republican*, Oct. 3: The snow was enthusiastically welcomed by a great many people who firmly believe that it is a forerunner of increased mining activity. Aspen has certainly earned the reputation that it bears of being a "winter camp." It has taken all of its great forward steps during the winter months, and the winter that is now coming on promises to be more remarkable in this respect than any that have gone before. There are signs of great developments during the next few months, and the greatest confidence exists on all sides. Tourtelotte park has been improving very rapidly during the past few weeks. A well-known mining man stated to your correspondent that it is his belief that the park will produce more ore during the month of November than during any month of its past history. The two leases on the Camp Bird have before been spoken of. There is some disappointment about the grade of the ore found in the north-end lease, but it is looking well and the lessees seem to be satisfied with the outlook. The lessees on the south end are jubilant. A 300-ton lot is being delivered at the sampler, and it is believed that it will run over 70 ounces per ton. The Blazing Star, in the southwestern part of the park, has struck two feet of very good ore. The ore was found at a depth of 337 feet. Assays ran from 44 to 231 ounces, an average sample returning 68 ounces. The Mary and Edith, another Tourtelotte property, has opened pay ore. The contact was reached in this mine at a depth of 220 feet, but the mineral first found was of too low a grade to handle. A drift 35 feet long to the southeast has developed a two-foot streak of mineral running from 70 to 110 ounces, there being four feet of 20-ounce ore in connection with it. This property is principally owned by Denver parties, M. J. McNamara and J. E. Bates being heavily interested. Richmond hill is attracting much attention. The discovery in the Little Annie has before been spoken of. The first lot of ore shipped from it was pretty carefully selected. It returned 75 ounces per ton. This was so good that the lessees tried shipping the whole product of the ore streak, some five feet thick. It was not supposed that this would go over 30 ounces, but the return on the five-ton lot was 51.2 ounces. This demonstrates that the mine is paying beyond all doubt. The ore cannot be economically mined through the present works, and the shipments will be small until the west shaft is driven down to the contact. The J. C. Johnson, in which two new rich ore bodies were recently discovered, has opened still another. This is in the fourth level. A 100-ton lot from the latest find has been sent to the sampler. It is expected to return considerably more than 100 ounces per ton.

BRITISH COLUMBIA.

THE CARIBOO MINES. — Kamloops *Sentinel*, Oct. 2: Dr. T. J. Jones visited all the mines in the section during his recent visit to Cariboo, but gave more particular attention to the Island Mountain and B. C. Co.'s property. The Island Mountain was first visited; in it there are four tunnels. The lower one is now 200 feet in the ledge, and averaging three feet in width, and all well mineralized ore. There is now on the dump, at a low estimate, 600 tons. The next tunnel, Johns tunnel it is called, is now in 211 feet, and averages 5 feet in width. On the dump there is 1000 tons of good ore. The Enterprise tunnel is in 420 feet, the ledge being about six feet in width. This tunnel is within about 800 feet of the Johns. All operations on the Island Mountain are at present suspended, although there are over 2000 tons of good ore on the dump and the oxidized ore to be found there would alone be sufficient to pay all running expenses and leave a profit besides. Besides the ore on the dump, there is enough in sight to last a year. If put in running order, the mill—a ten-stamp one, with four concentrators, a large crusher and all the most modern machinery—would realize a profit of $100 a day. The Graphite is another very promising ledge, also owned by the Island Mountain Co. The Graphite is seven feet wide on the face, and the tunnel is in 64 feet. There is about 180 tons of ore on the dump, and the operations here also are for the time being suspended.

DAKOTA.

CARBONATE.—Deadwood *Pioneer*, Oct. 3: A force of men is employed on the Lardner water-ditch that supplies the Caledonia mill with water. They are repairing the large dam on Upper False Bottom creek, and are going to erect another bed-rock dam at the forks of False Bottom creek and put in a powerful steam pump to elevate the water into the ditch. This will insure a large supply of water even in the driest season. Several men are at work sinking a shaft on the Little Iron lode adjoining the Spanish R property. They are now down between 40 and 50 feet. Work goes steadily forward in the Albe mine, adjacent to the Iron Hill. Drifting from the bottom of the shaft will commence in a few days. This mine has shipped several cars of rich ore at different times and has good prospects. The Seabury-Calkins Consolidated Mining Co. on yesterday finished the shipment of six cars of ore to the Kansas City smelter. This ore averaged about $60 per ton in gold and $5 in silver. There is considerable more high-grade ore ready for shipment. The Spanish R Co. continues shipping ore to Kansas City, averaging about three carloads of ore per week. Work is now going on in the 100 and 170 foot levels, and some very rich soft carbonate ore is being taken out. Great difficulty has been experienced in getting teams sufficient for transportation to Whitewood. C. A. Peckinpaugh, formerly employed in the Deadwood Reduction Works, has charge of the hoisting engine, and Geo. Furner of Deadwood is book-keeper.

IDAHO.

CRUSHING.—Idaho *World*, Oct. 1: Capt. Smart finished a crushing of ore this week from the Mountain Queen mine at Grimes' Pass, at the head of Muddy, and the result was fully equal to expectations. The ore was crushed in Morrell's mill in Lewis' gulch. Four or five thousand dollars have been put in this mine in development. The ledge is 30 feet wide—all ore—some high grade and some low grade, but averaging well. The chances are more than favorable for a sale of this mine, as well as the Ohio, a short distance north of Placerville. Present indications are that the Ohio will equal or surpass the Gold Hill Co.'s mines, which have for over 20 years been among the best paying mining properties in the Territory, and still paying as well as at any time since operations began. There are three veins in the Ohio—one four feet, another ten feet, and one wall not reached, and the other from eighteen inches to two feet. The ore, by a mill test, averages $15 per ton. The pay continues from 500 to 800 feet in length.

EMMA & LAST CHANCE.—Wardner *News*, Oct. 2: The concentrator of the Emma & Last Chance Co., the capacity of which has been increased from 50 to 120 tons of ore per day, was started on Thursday, Sept. 26th. The new machinery is in place and all is complete with the exception of some woodwork on the Evans tables. This will be finished next week, when the entire plant will be in operation. The works now in use consist of four jigs, two sets of rolls and one crusher. The automatic feeder, invented by A. S. Denaugh, works to a charm. The building is most admirably arranged, and for compactness and completeness in every detail it has no superior in the country. When every department is in working order, which will be ere the expiration of next week, the output of concentrates will average from 20 to 25 tons per day.

TIGER.—Three eight-hour shifts are constantly employed in the shaft of the Tiger, which is now down 100 feet. The highest grade ore yet found in this mine is at present being extracted in this working. The vein is from six to eight feet wide. Drifting is progressing in levels Nos. 1, 2 and 3, and stoping proceeds as usual. It is feared that a scarcity of water will compel a temporary suspension of operations at the mill, until an engine can be procured. The company has a boiler in place, but as the concentrator has been run successfully by water-power, no engine was provided. The mine never looked better than at present, and enough ore is in sight to keep the mill running an indefinite period.

LOWER CALIFORNIA.

ALAMO.—Cor. San Diego *Union*, Oct. 3: Over 200 mining properties have been denounced in this district within a radius of five miles, and possession has been given by the Government to the owners of nearly 50, while others are undergoing preparatory development. Four or five small mills are already in operation, and two or three others will soon be on the ground, and all, I believe, aim to run night and day. The principal mines are on the northeast slope of Santo Tomas mountain and in the valley west of the town. Several are located on Alamo peak, and others are being worked to the north of that mountain in Mexican gulch. The whole country is of a granite formation, interrupted by trap dikes. The quartz veins are often well defined, and large quantities of iron ore are associated with the quartz and is especially auriferous. Large specimens of iron ore were taken from the Encantada mine that were rich in free gold. This iron ore is characteristic apparently of the district and forms a considerable portion of the paying ore that is mined. Six of the best mines in the district were sold for $30,000 to the English capitalists who succeeded the International Co. of Mexico, and we are informed that ore of a very high grade was already exposed in them sufficient in quantity to more than cover their cost. Wages vary from $3 to $4 per day, Mexican silver; those who work above ground usually receive $2 per day, while those working in tunnels or shafts receive $4 per day. Board is $1 a day at the restaurants, none of which may be said to be first-class. Few American miners will seek Alamo for work at these prices. Even at the prices, many were out of work, and men were leaving daily, some on foot in search of work, with the nearest prospect of employment 35 miles away. As yet the mines are merely prospects, none of them having been developed to any depth much beyond 50 feet. The character of the formation is unfavorable to the idea of the mines proving of permanent value. Granite is usually looked upon with more or less suspicion, but the abundance of auriferous iron ore is a good indication, and there are some other features peculiar to the district that lead one to watch the future developments with interest.

MONTANA.

RED LION DISTRICT.—Phillipsburg *Mail*, Oct. 5: A camp which promises a good deal for the future is that now known as the Red Lion, located about 1½ miles east of Georgetown. This camp is comparatively new. The Red Lion Mining Co. was organized last March, and has since been operating in a very satisfactory manner; but not much was accomplished until the middle of February, when an ore body came in sight that assured them success, and they at once commenced the construction of a ten-stamp mill, which was completed and put in operation about four weeks ago. This property was first opened up by Henry Schnepel and others in 1869, and the old arastra used in those early days for treating the ores is still on the ground. These parties were not successful in their operations, and after sinking two or three shafts and some $30,000, they abandoned the camp, and it remained unmolested until the past year. The first development done by the present company was on shaft No. 2, which was sunk down 60 feet, where the big ore body is deposited. They then drifted east on the ledge and connected with shaft No. 3 by a raise. This was done principally to get pure air in the shaft, which has already become quite pungent. The drift was then run in an easterly direction on the vein, and is now in 100 feet from shaft No. 3. The ore body averages six feet in width, the entire distance, and nothing but solid ore has yet been taken out of these diggings. The company is soon to build a shaft-house, and when that is completed, it is the intention to continue sinking the shaft. The ore is decomposed quartz, averaging about $12 in gold, and requires but little labor in breaking. At the mill they take off a nice quantity of amalgam from the plates every day. On the west side of the gulch, in a direct line between the Red Lion and the Granite mountain, about one mile from the Red Lion and 2½ miles from the Granite, is the Diamond, another very promising property. The Diamond Co. has a crew of men sinking a shaft that is now down 50 feet, and they are already getting out some very rich gold ore with indications of soon reaching a large body. Old miners and all who have visited this section say the future prospects for this camp are the best to be found anywhere in Montana, and with the same amount of work and expense it is now making the best showing of any property ever opened up in the Territory. They have an abundance of water and timber close by.

NEW MEXICO.

DEVELOPMENT WORK.— Silver City *Enterprise*, Oct. 4: The Mamie Richmond, of Hillsboro, has been closed down, followed by the usual number of miner's liens on the property. The Deep Down mill was sold in St. Louis recently for $540. Of course this was subject to the Davidson & Co. attachment for $6000. A settlement has been effected by Davidson & Co. taking a one-eighth interest in the property. Work will soon be resumed in the mine. The owners of the Flower Queen mine, near Cook's Peak, have shipped ten carloads of ore to various reduction works. These ores have run about 30 ounces in silver, 30 per cent lead and 30 per cent zinc. This character of ore makes it undesirable to lead smelters, and the owners have determined to send a quantity to Swansea and Freyburg for reduction there.

UTAH.

BULLION PRODUCT.—Salt Lake *Tribune*, Oct. 4: The week has been a fair one in mining matters, with about average output of ore and bullion. The receipts in this city for the week ending the 2d were to the value of $122,623.13 in the aggregate, of which $78,337.55 was in ore and $44,285.58 was in bullion. For the previous week the receipts were $50,326.46 in bullion and $60,799.29 in ore, a total of $111,125.75. The product of the Ontario for the week was from ore sales, $14,884.93; bullion, 18,735.17 fine ounces; an approximate total of $33,620.10. The Daly output for the week was in ore sales, $5823.61; bullion, $20,354.83; a total approximately of $26,178.44. The Horn Silver election occurred on the 1st, the old board being re-elected. No local reports come from the mine or its operations. Fine bar receipts in this city during the week were in value $1300; gold bar, $3500; bullion, $24,860.58. The Hanauer smelter produced during the week bullion valued at $14,625. Ore receipts in this city during the week were to the value of $41,343.55 by Wells, Fargo & Co. and $36,994 by McCornick & Co., including $2025 Crescent.

MECHANICAL PROGRESS.

LIMITS OF STEAM EXPANSION.—The following extract from a circular issued by the English builders of a high-speed engine said to run satisfactorily at 700 revolutions per minute and to develop 200 horse power, is interesting, since it attempts to confine the use of double and triple expansion to certain limits: If the boiler pressure always exceeds 70 pounds, it is worth while to use a compound engine; if as high as 150 pounds, a triple-expansion engine. If the engine exhausts into a vacuum, the corresponding pressures will be about one-fourth lower. The extent to which the steam may be expanded with advantage depends upon the boiler pressure. If the expansion is carried to more than a certain number of volumes, it is advantageous to divide it into two stages—*i. e.*, to expand partly in a high-pressure or small cylinder or cylinders and partly in a low-pressure or large cylinder or cylinders. With still greater expansion it is worth while to expand in three stages—*i. e.*, in three successive cylinders of increasing diameter, and so on But although there are great practical and economic advantages in the system of expansion in successive stages, there is no essential difference in principle between expanding, say, eight times, in a series of three cylinders, with a comparatively late cut-off in the first or smallest one, and expanding eight times in the largest of the three only, with the steam admitted to it direct and cut off at one-eighth stroke.

GLYCERINE IN TEMPERING. — Glycerine is found to possess many advantages in tempering steel and cast iron. The specific gravity of the glycerine may be varied between 1.08 and 1.26 at 15 deg. Cent. by adding water, according to the composition of the steel. The quantity of glycerine should be from one to six times greater than the weight of the pieces to be plunged into it, and its temperature may be varied from 15 deg. to 200 deg. Cent., according to the hardness of the metal. The harder the steel to be tempered, the higher should be the temperature of the glycerine. To increase the quenching power of the bath, various salts may be added. Thus, when a harder temper is required, protosulphate of magnesia may be added in quantity from 1 to 34 per cent of the liquid, or from ¼ to 4 per cent of sulphate of potassium. For a softer temper 1 to 10 per cent of chloride of manganese and 1 to 4 per cent of chloride of potassium may be added. The principal advantages to be derived from these methods are: 1. The temperature of the aqueous solution of glycerine may be varied within wide limits, the boiling point of pure glycerine being 290 deg. Cent. 2. Owing to the fact that solutions of glycerine dissolve most salts that are soluble in water, the quenching properties may be varied by readily dissolving in the bath such salts as suit the kind of metal to be tempered and the degree of temper required.

IS STEAM LOSING ITS GRIP?—There are motors—and motors, and the query is sometimes propounded, "Is the use of steam to be superseded by any other motor?" Sometimes it has seemed as if gas and compressed air and magnetism and electricity were, either one or all, going to dethrone the old king and usurp his functions, but he yet holds his scepter and reigns supremely in a hundred thousand engine-rooms. Other aspirants for public favor have been heard and tried, with more or less success, but the steam boiler and engine still hold sway in the machine-shop and factory, where their faithfulness to duty and mighty power have stamped them as trusted servants. It will take a long time to prejudice the trades against the use of steam—but the present generation will have passed away before it will be laid aside. The hand of the engineer and his inventive genius will be exercised to improve the boiler and engine until they reach the perfection of science, when there will be no necessity for their expulsion, for they will then have no superiors. The electric motor will have its sphere of usefulness; it will be popular for a thousand purposes, but it is doubtful whether it will ever become anything more than an auxiliary of the steam engine.

STEEL HOUSES NEXT.—A very favorable account is given in the French papers of the new system of building houses of steel plates, introduced some time ago by M. Danly, manager of the Societe des Forges de Chateleneau, and who has set forth the many advantages in an interesting and plausible manner, attracting considerable attention. M. Danly has satisfactorily ascertained that corrugated sheets of no more than a millimetre in thickness are sufficiently strong for building houses several stories high, and the material used allows of quite a variety of architectural ornamentation. The plates thus employed are of the finest quality, and, as they are galvanized after they have been cut to the sizes and shapes required, no portion is left exposed to the atmosphere. It is asserted that houses constructed in this manner are very sanitary.

A PERMANENT AND DURABLE JOINT can, it is said, be made between rough-cast iron surfaces by the use of mineral asbestos mixed with sufficient white lead to make a very stiff putty. This will resist any amount of heat, and is unaffected by steam or water. It has been employed for mending or closing cracks in cast-iron retorts used in the distillation of oil and gas from cannel coal. The heat being applied to the bottom of retorts, and the temperature of the iron maintained at a bright red heat, after a time the bottom of the retort would give way, the larger portion of the crack being downward toward the fire. The method employed was to prepare the mixture, and place it on the top of a brick, then put the brick on a bar of iron or shovel, and press the cement upward to fill the crack in the iron, holding it for some time until it had penetrated the cavity and somewhat set. Of course, during this operation, the lid was removed from the retort, so that no pressure of gas or oil forced the cement outward until set.

TO ESTIMATE BRICKWORK.—Readers in many branches of trade will be glad to know this method of estimating brickwork, which is obtained from an authority on the subject: Ordinary bricks are about eight inches in length, and with the mortar joint about half that in width, so that each brick on the flat will give a horizontal surface of about 32 square inches, or 4½ bricks will cover a square foot. As ordinarily laid, there are nine courses to every 24 inches, or 4½ to the foot. Four and a half courses, with 4½ bricks to the course, will give 20¼ bricks to the cubic foot. Waste, cutting and closer joints will easily require an allowance of 21 bricks per cubic foot, which will be found a very convenient figure for estimating the number of bricks required for a wall of given hight and thickness, as it thus becomes unnecessary to find the cubic contents of the wall, but merely to multiply its face area, or the product of its length and hight in feet, by seven-fourths of its thickness in inches, which, as the thickness is always some multiple of four inches, is a very simple process.

ZINC IN CONTACT WITH BRICKS.—Recent experience in Germany points to the fact that under some conditions sheet zinc, when in direct contact with brickwork, suffers from rapid corrosion. It appears that in building the Berlin City market halls some sheet zinc work which rested upon brick walls was deeply pitted at a number of places, and particularly where the metal was in direct contact with the bricks. Chemical examination of these showed that they contained as high as 1.14 per cent of soluble salts, capable of producing the destructive effects noted, and stimulated to more energetic action by moisture. The proportion of such salts will vary with different kinds of bricks, and in some there may be nothing to induce such corrosion as that here noted. It would be an advisable, and, in the end, a cheap precaution to avoid immediate contact of sheet zinc and brickwork by inserting a layer of roofing-felt or similar material.

IRON AND STEEL.—While the population of the United States during the past ten years has averaged about 4 per cent of the estimated population of the globe, the consumption of iron and steel in this country has averaged 30 per cent of the world's consumption and now exceeds 40 per cent. The consumption of iron steadily increases, notwithstanding the recent enormous reduction in its use for railway purposes. Both iron and steel are being used more and more widely every day in buildings, bridges and other structural work; and while the American product for 1889 will exceed that of Great Britain, it is not large enough to supply the home demand. One cause of the extraordinary growth of the iron and steel industries is the cheap conversion of iron into Bessemer steel and the ready adoption of steel to structural shapes for ships, bridges and buildings; into nails, wire, axles, springs, tools, shafting, etc.

A MACHINE TO SEW THE MOUTHS OF SACKS.—The Winnipeg *Sun* says that Robert Little, of Cypress River, has constructed a machine to sew the mouths of sacks when filled with flour. The bag is sewed with wire instead of twine, thus reducing the cost, and the work done is in every way as perfect. The bag being placed in position, by a single draw of a lever the wire is taken off spindles along the length of the machine in a groove, cut into lengths about an inch long, each length made into a staple, which is driven into the bag and clinched. The mouth of the bag is doubled up; thus the staple is driven through four ply of cloth. The staples are about an inch apart. The machine is all iron, and occupies a space about two feet each way.

PRESSED STEEL AT THE PARIS EXPOSITION.—The exhibit of pressed steel at the Exhibition is a good one, and shows, probably more than any other display, the tortuous shapes in which good steel can be worked without fracture. Immense boiler plates, tender frames and other engineering details are shown made from one single large piece of steel without perceivable fracture. There are works in this country which are prepared to do all kinds of this class of work.

TEMPERING COPPER, one of the lost arts, has been accidentally discovered, and tests of the quality of the copper thus treated have shown remarkable strength and wearing qualities. It will be especially valuable for the bearings and commutators of dynamo machines, and for journals of locomotives and cars. An establishment in Pennsylvania is now placing the metal upon the market.

SCIENTIFIC PROGRESS.

Surface Tension of Liquids.

Curious effects appear when liquids having different superficial tensions are brought together, and when solids containing volatile properties are thrown upon a liquid, writes W. H. Larrabee in the *Popular Science Monthly* for September. With two liquids that will mix, as water and alcohol or ether, the tension at the point of contact becomes null, and the lighter fluid spreads out over the other. This is followed, according to M. Van der Mensbrugghe, by a retreat of this fluid toward the point where it was dropped, in consequence of an increased tension given to that point by the cooling that follows the evaporation of the dropped liquid. If the liquids will not mingle, as when oil or turpentine is dropped on water, the drop spreads over the surface, forming a thin layer upon it which is marked by beautiful plays of colors.

M. Devaux exemplifies one of these effects by an experiment in which a tin boat, having a notch cut in the stern, is launched upon the water. On letting a drop of alcohol fall at the notch, the boat moves away as if driven by some repulsion. There is, however, no repulsion; but the tension astern has been destroyed or diminished, while that forward continues in full force to draw the boat onward. If a bit of camphor be substituted for the alcohol, its vapor has the same effect upon the tension, and the boat may be made to sail regularly, with considerable speed, for hours. The experiment is made more spectacular by furnishing the boat with a mast carrying a flag.

In another experiment described by M. Devaux, a few granules of camphor are sprinkled upon mercury, and breathed upon till a kind of lye is formed, when a multitude of long-tailed "tadpoles" appear swimming over the surface of the mercury. If, now, we breathe continuously from one side upon the mercury, the "tadpoles" will become more lively, and direct themselves against the breath, coming up to the very edge of the mercury.

The Flight of Insects.

A contributor supplies instances of the high speed attained by insects in their flight, many of them being able to outstrip swift birds. It has been computed that the common house fly in ordinary flight makes 600 strokes per second and advances 25 feet, but that rate of speed, if the insect be alarmed, may be increased six or sevenfold, so that under certain circumstances it can outstrip the fleetest race-horse. It is no uncommon thing to see a bee or wasp endeavoring to get in at the window of a railway train in full speed. and it is calculated that if a small insect can fly faster than a race-horse can run, an insect as large as a horse would be able to travel as fast as a cannon-ball. Leunwenholk relates an exciting chase, which he beheld in a menagerie, about 100 feet long, between a swallow and a dragon fly—among the swiftest of insects. The insect flew with incredible speed and wheeled with such address that the swallow, in spite of its utmost efforts, completely failed to overtake and capture it. A pigeon-fancier of Hamme, in Westphalia, recently made a wager that a dozen bees liberated three miles from their hive would reach it in better time than a dozen pigeons would reach their cote from the same distance. The competitors were given wing at Rhyhern, a village nearly a league from Hamme. The first bee reached home a quarter of a minute in advance of the first pigeon. Three other bees reached the goal before the second pigeon, the main body of both detachments finishing almost simultaneously an instant or two later. The bees, it may be mentioned, had been handicapped in the race, having been rolled in flour before starting for purposes of identification. According to Chabrier, the male of the silkworm moth travels upward of 100 miles in one day, and there are many of our British moths, as entomologists well know, which can cover long distances in an incredibly short space of time.—*St. James Gazette.*

WHY THE LEAVES TURN.—Why the leaves turn is a question that puzzles many people at this season of the year and is one that is well answered by an eminent botanist in *Field and Forest*, who says: The common and old-fashioned idea is that all this red and golden glory we see now is caused by frosts. A true and scientific explanation of the causes of the coloring of the leaves would necessitate a long and intricate discussion. Stated briefly and in proper language, those causes are these: The green matter in the tissue of a leaf is composed of two colors, red and blue. When the sap ceases to flow in the fall, and the natural growth of the tree ceases, oxidation of the tissue takes place. Under certain conditions, the green of the leaf changes to red; under different conditions it takes on a yellow or brown tint. This difference in color is due to the difference in combination in the original constituents of the green tissue and to the varying conditions of climate, exposure and soil. A dry, cold climate produces more brilliant foliage than one that is damp and warm. This is the reason that our American autumns are so much more gorgeous than those of England. There are several things about leaves that even science cannot explain. For instance, why one of two trees growing side by side, of the same age and having the same exposure, should take on a brilliant red in the fall, and the other should turn yellow; or why one branch of a tree should be highly colored and the rest of the tree have only a yellow tint, are questions that are as impossible to answer as why one member of a family should be perfectly healthy and another sickly.

INTERESTING EXPERIMENT.—It is well known that nickel loses its magnetic susceptibility when heated, and that this loss occurs at a very much lower temperature than in the case of iron. This property is shown very neatly by a simple piece of apparatus. A small copper disc is suspended by means of two hooks and a pair of threads from a support, so that it can swing in its own plane, forming, in fact, the bob of a pendulum. A small bar of nickel projects on one side from the edge of the disc, and opposite to this nickel bar is a steel-bar magnet fixed in a horizontal position in such a way that when the nickel is in contact with the magnet the pendulum deviates slightly from the vertical. The copper disc is blackened, in order that when heated it may cool again as rapidly as possible. When the apparatus is left to itself, the nickel is attracted by the magnet and remains in contact with it. When the nickel bar is heated by means of a gas flame, it almost immediately loses its magnetic susceptibility and ceases to be attracted; it therefore swings away from the magnet, in obedience to gravity. By the time that it is swinging back toward the magnet, it has become cool enough to have regained its magnetic susceptibility, and is, therefore, again attracted by the magnet, but it falls away again, almost immediately, owing to its being brought into the flame. If the flame is kept steady, the oscillation can be kept up for some ten minutes.

THE FIXED STARS, as is now well known, are not fixed, but have motions which are constantly varying their relative positions with each other. The familiar appearance of the "Dipper" in the northern heavens is gradually losing its shape, and in a few thousand years will bear no resemblance thereto. Even the North star is a moving body. It is quite well known that it does not occupy the exact position of the pole, but is approaching thereto. It is upward of a full degree from it. It will come within one degree of it about 1944 A. D., and will remain within a degree of the pole 300 years, making its nearest approach about 2102, when the declination will be 89 degrees, 32 minutes, 23 seconds.

ONE REMARKABLE COINCIDENCE of the great storm on the Atlantic Coast, recently, was found in the Upper Geyser Basin of the Yellowstone (Montana) National Park, which experienced several subterranean convulsions, followed by tremendous explosions. The great geysers, the "Giant" and "Giantess," were unusually active during the commotion, and others that were deemed extinct flowed freely. The connection between the Eastern storm and the Western hot-water ebullition will furnish an interesting study for the scientists.

WRITING AS A LOST ART.—Will the coming man write? asks the Atlanta *Constitution*. Not at all. There will be no more need of his learning to write than learning to spin. Writing will have become one of the lost arts, and a wholly unnecessary art, by the time the coming man appears. His writing will be done by the phonograph, which will be placed on his desk as pens and ink are now, and whenever he has a story, a poem, an essay, or a private letter to indite, he will simply talk into the phonograph and send on the plate which has recorded his words.

A REMARKABLE BERRY.—The "miraculous berry" of West Africa, the fruit of Sideroxylon dulciferum, was lately exhibited to the London Linnean Society. The soft, sweet pulp with which it is covered so affects the nerves of taste that sour substances—even tartaric acid, lime juice, and vinegar—have a flavor of absolute sweetness after it has been eaten. Living plants of this and of thaumatococus, whose fruit possesses similar properties, have been received at Kew Gardens.

MAMMOTH REMAINS IN SIBERIA.—The abundance of remains of the mammoth in Siberia is almost incredible. Middendorf reckoned that at least 100 pairs of tusks had been put upon the market yearly during the last two centuries, and from personal observation Nordenskjold is inclined to regard this estimate as too small. It thus appears that in recent modern trade useful tusks of more than 20,000 of these animals of past ages have been collected.

LIGHT AND LIFE.—An English scientist has been making experiments to determine the important part light plays in the development of animal life. A dozen tadpoles were confined in a box from which every ray of light was excluded. The result was that only two of them developed into frogs, and these were short lived. The others increased considerably in size, but never left the tadpole form.

ROCK CRYSTAL.—Pieces of rock crystal heated in a platinum tube and dropped into water fly all to pieces, but if a drop of melted crystal is allowed to fall into water, then, though there is a great commotion, it does not break, but remains clear.

GOOD HEALTH.

Disease of the Heart.

In diseases of the heart which persist for a long time and finally end—as a very large proportion of them do—in slow decline and a lingering death, dropsy always sets in. In the last stages it is a most intractable symptom, and adds greatly to the suffering experienced. In the treatment, physicians have been wont to depend largely upon a diet of milk, which, in cases where it is well borne and can be persisted in, always acts well. But there are many patients who, for various reasons, cannot be kept on a milk diet for any length of time. To some it becomes abhorrent after awhile, and others really cannot digest it properly, as simple food as it is. And besides that, a milk diet is unsuited to no small proportion of patients affected with cardiac diseases. We have reference to those who cannot be kept quiet, but insist upon being up and about, often in the open air, if not engaged in light duties. Prof. Germau See of Paris has long been engaged in study to learn what elements in milk rendered it such an admirable agent to stimulate the kidneys, increase the flow therefrom, and hence prove of such great service in dropsies. As a result of his investigation he is convinced that the one important element is sugar of milk. Acting upon that theory, he selected 25 patients with heart disease, in all of which there was more or less dropsy. To each he gave 100 grammes of the sugar of milk a day, dissolved in two quarts of water. In all these cases a marked effect upon the kidneys was felt within from 24 to 45 hours, and the dropsies diminished rapidly, and almost all such swellings disappeared altogether after a series of treatments, lasting from six to eight days. This discovery is likely to prove one of the most important which has been made in the medical world for years.

A REMINDER FOR FAMILIES RETURNING TO A CLOSED HOUSE.—The *Monthly Sanitary Record* gives the following hints regarding the dangers of vacated houses: A good many people will soon be returning to their homes after their summer's vacation, and we would caution them about the danger of returning to a house which has been closed for some time, especially when the house is connected with the public sewer. In all probability the water seal in the traps of the plumbing fixtures will have become evaporated, and the air from the sewer permitted to fill the house. The germs of typhoid fever or other disease thrown into the public sewer may possibly be carried into the house in this way. It has frequently happened that typhoid fever has broken out in a family recently returned from a vacation of several weeks, and in all probability the disease has been caused in this manner. Families about to return to an unused house should have some one open all the doors and windows and thoroughly air the house for several days before their return, and also with buckets or hose to flush out the entire plumbing system of the house, thus filling all traps and cutting off communication with the sewer. Let no one neglect these simple precautions; they may possibly prevent the sickness or death of some member of your family.

EXECUTING BY ELECTRICITY.—London *Iron* sums up the difficulty which must attend executions by electricity in the following manner: Every particle of the nervous tissue is polarized, and polarization causes each particle of matter to revolve on its axis, which means the stretching of the nerves out of all proportion, and consequently the most intense pain. But the great fault with execution by electricity is that it is almost impossible to ascertain just how strong a current will kill a man instantaneously and yet not be a barbarous mode of killing. If the current be but a few volts stronger than that required to instantly execute a certain person, the consequences would be terrible. It would disfigure the body beyond recognition, and would disintegrate every portion of the corpse. Should the current be just a trifle too weak to execute a person, it would throw him into a trance so death-like that it is probable that the body would be buried alive.

A REMEDY FOR PRICKLY HEAT.—Olive Harper, in a recent article, gives the following remedy for prickly heat, and a hint or two as to what to do when the festive mosquito plants his tiny bill in your flesh: I have just discovered that if any person subject to prickly heat in summer will bathe the places in a weak solution of saleratus water and dry them with a soft cloth, and afterward powder them with a powder made of equal parts of fuller's earth and rice flour, he will have perfect ease. It should be done night and morning in the hot weather, and if a mosquito bites you, don't try any heroic remedy, but simply apply a little cold cream, which somehow overcomes the poison and irritation when nothing else will. I have seen children that were nearly wild with the irritation of many mosquito bites, calmed in a moment by the application of cold cream.

DANGER IN THE RUSSET SHOE.—The Boston *Express* says the russet shoe, which greets the eye everywhere, has been found to be a regular little arsenal of poison. In order to give the leather its peculiar color, chemicals of a very poisonous character are used. When the shoes become wet, the skin, unless thick stockings are worn, absorbs some of this poison. Pimples and blotches in yellow color are formed, and at times become quite painful. Physicians at first were puzzled by the eruptions shown them by patients, but after studying the matter, they imputed the cause of the trouble to this dainty pet of the fashionable people.

THE MOST IMPORTANT FUNCTION OF UNDERGARMENTS.—It is a great mistake to suppose that the material of which a garment is made is the most important consideration in selecting warm underclothing. The way in which the fabric is prepared and manufactured is of more vital importance as regards heat or coldness of the body than the actual material. A light garment with large meshes is more effective against cold than a close, heavy one. Whatever an underveat may be made of, its real value as a protector from cold depends upon its ability to inclose within its meshes a certain quantity of air. This is indeed the most important function of undergarments, viz., to encircle the whole body with an envelope of warm air, and a vestment that does not keep a continual layer of warm air next to the skin is of very little use.

IMPORTANT IN FUMIGATION.—Dr. Squibb of Brooklyn (*Medical News*) in a recent address on sulphur fumigation in the prevention of infectious diseases, directed attention to the important fact that, in the absence of moisture, the penetrating power of sulphurous acid gas is only slight, and for this reason there should be an abundance of aqueous vapor in the apartment in which the sulphur is burnt. Boards of Health neglect to emphasize this fact, which is not known to the laity. The *Medical News* recommends that water be kept boiling in the room in which gas is being generated. Dr. Squibb also called attention to the relative uselessness of chlorine gas as a disinfectant in the absence of aqueous vapor.

NERVOUS HEADACHE.—Dr. Batrom has lately employed common salt in the treatment of nervous headache, and Dr. Nothnagel has recommended the same in the treatment of epilepsy. Dr. Cerne attributes his success in the treatment of the first affection with this remedy to an increase of the hydrochloric acid of the gastric juice. In a case of gastralia and headache, or "brow ague," in which the treatment simply consisted in augmenting the quantity of salt in the food, he noticed that the dyspeptic symptoms and stomach pains disappeared entirely.

DEATH FROM AN INSECT'S STING.—A short time since C. Mignard, a compositor of Hoboken, N. J., was stung on his lip near the nose by an insect. He rubbed the spot with his finger when it itched, and his face swelled terribly. He died on Sanday last and it is thought that the lead from the type which he handled poisoned him.

USEFUL INFORMATION.

BUYING AND KEEPING ICE.—It may be a useful hint to housekeepers that the cheapest way to buy ice is to get 100 pounds at a time. Properly managed, it will last a week, even for a large family, and be sufficient for all requirements. When the price of ice is 35 cents a week for the daily serving of eight pounds (the smallest quantity served), the cost of a piece weighing 100 pounds is 40 cents. It is plain to be seen that for the additional 5 cents you get nearly double the quantity of ice. The man who delivers it will carry it down cellar for you, place it where you wish and crack it in four pieces if requested to do so. It should be wrapped first in a piece of old muslin or linen, and then in a dry blanket. If you have no ice-chest, it can be kept in a large tub, but it must rest on something which will raise it three or more inches from the bottom of the tub, so that it will not lie in the water which will drip from it—inverted flower-pots will do. A piece of carpet, an old blanket or several thicknesses of a large newspaper should be thrown over the top of the tub, to keep out all the air possible. The tub should be emptied, scrubbed and wiped as dry as possible once a week at least. After bringing up a piece of ice for the refrigerator, see that the remainder is well wrapped up. If the piece you have brought up should be too large to go into the ice-chamber, be careful not to waste any in cracking. It is a good plan to measure the length and width required, and then break the piece as near the size as possible, remembering that the larger the piece of ice, the less it melts; also, that if the ice-tank is kept filled, the better the ice will keep. If you have not a good pick, a strong knife-blade and a hammer will crack the ice without splintering it, as so many picks do.—*August Table Talk.*

RAPID ELEVATORS.—The swiftnes with which passengers are carried—if "shot" is not the more appropriate word—from lower to upper floors of buildings in elevators of the latest construction is not a little trying to the nerves of unaccustomed travelers. There is presumed to be, however, no sacrifice of safety to speed. The *Northwestern Architect* remarks: "Speaking of the Eiffel tower, it may not generally be known that two of the elevators used therein are of American make; the others were furnished by M. Edoux of Paris. The French elevators have speed of 200 feet per minute, while the American has just double that, or about 400 feet per minute. This is not a high rate of speed for an American elevator, one having been timed to a speed of 126 feet in 6½ seconds, a rate of 1163 feet per minute, while a working speed of from 500 to 700 feet per minute is not an uncommon rate. Nothing like this has been seen in Europe, however, and, no doubt, many who ride in the Otis elevators at the Paris Exposition will quite lose their breath on the trip. The Exposition will undoubtedly do much to popularize the elevator abroad, and should it create a demand for the American machines, so much the better for our elevator builders."

THE CARE OF TINWARE.—Many women spend a good deal of time in trying to keep tinware bright by scouring it with some kind of powder each week. This is a poor plan, as the less scouring tinware receives the better. It removes the outside coating, and though it be kept looking bright by hard labor, it will never look as well as if it were washed in clean, hot suds. To be sure, when the tin is stained the stain will have to be removed by scouring, but only enough should be done to remove the stain. Kerosene and powdered lime, the lime very finely pulverized, is claimed to clean tinware nicely, and wood ashes is also recommended for the same purpose. A better powder may be made of the soft white cinders that are usually thrown away. After sifting the ashes from the stove, pick from the cinders all the soft, white ones. They must be soft enough to crush into a powder between the thumb and finger, and after crushing up fine they are ready to be used. First wash and wipe the tin clean, then with a flannel rub it over with the powder. It is so fine that it does not scratch or wear off the coating and gives the tin a beautiful polish. Never use lye on tinware; it will ruin it. Keep an old toothbrush for getting into the seams around the handle and rim. Never put vinegar, tomatoes, or any acid substance in tin. When tins are new, first fill with boiling water and let stand for a little while before using. To mend holes in tinware, use putty, putting it on the outside.

THE pine fiber business seems to be fast rising to an important industry. It is now stated that the American Pine Fiber Company, Wilmington, N. C., has effected an organization. The authorized capital is $1,000,000, and the object of the corporation is to manufacture textile fabrics, such as matting, carpeting, burlaps and bagging, from the fiber of the straw of the long-leaf pine. The company has purchased all the patent rights and the plant for making fiber owned by the Acme Manufacturing Company and in operation at Cronly, N. C., and will largely extend the operation of these works. The present annual capacity of these mills for the manufacture of pine fiber bagging is 500,000 yards, but the new machinery that will at once be added will more than double the capacity.

FRENCH POLISH FOR HARDWOOD DOORS.—For French polish for hardwood doors: 1. Shellac, 3 pounds; wood naphtha, 3 pints. 2. Shellac, 2 pounds; powdered gum mastic and gum sandarac, 1 ounce each; copal varnish, ½ pint; spirits of wine, 1 gallon. Mix, and shake cold till dissolved. It will be useful to many of our readers to know how to apply a French polish. This is by means of shellac varnish, using a rubber, after smoothing the surface with finest glass paper. Place the work opposite the light to see the effect of varnishing. Operate the rubber with circular motion, lifting it vertically and finishing it off at margin. Three coats are sufficient. Finish with alcohol and oil.

AUTOMATIC ADDING SAVINGS BANK.—The automatic adding savings bank will surely prove a success, especially with the young people. The bank is so constructed that it keeps an account of its contents, is made to receive one cent, five cents and ten cents, respectively, and opens automatically. Every time the deposits amount to one dollar, if the owner so desires, he may leave the one dollar, close the door again, and it will reopen every time another one dollar is deposited. It adds by merely dropping coin into a slot; one cent, bank registers to one dollar; five cents, to ten dollars; ten cents, to ten dollars; and will readjust itself every time these amounts are reached.

SMOKELESS POWDER has excited so much interest in Germany that the Emperor of Germany has, as a token of his satisfaction, promoted Colonel Kuster, the inventor, to the rank of Major-General, and made him a present of 50,000 marks (£2500). And now comes a report from the English Ordnance Department saying that smokeless powder has proved a humbug, as it will not retain its normal explosive quality under prolonged field service.

THE EIFFEL TOWER is not only an engineering but a financial success. The shareholders have now received back three-fifths of their capital, and it seems as if the entire share capital will be paid off before the termination of the exhibition, thus leaving the remainder of the 20 years for which the concession is obtained to earn interest on money which the shareholders can employ at the same time in other fields of enterprise.

THE TELEPHONE IN FRANCE.—The French Government has notified every telephone company in the country that the Government will take possession of the lines within 12 months. The service will then be furnished the public at cost.

ELECTRICITY.

New Uses of Electricity.

Among the most recent uses to which electricity has been applied, we note the following: A process has been patented in England for bleaching paper pulp by electricity. Esparto grass, hemp, flax, straw, jute, and other vegetable fibrous pulp materials are used in the manufacture of paper, by means of a solution of common salt in water or any other chloride solution decomposed by the electric current generating in it halogens such as chlorine, a cheap oxidizing and decolorizing agent equal to the most energetic solution of bleaching powder. The paper pulp is treated in bleaching tanks, where the electrolyte is raised to its proper degree of bleaching power by the action of oxygen or ozone in its nascent state, in combination with chlorine and hydrogen circulated and maintained at the required chlorometric standard by the influx of freshly electrolyzed solution to replace the corresponding quantity of exhausted electrolyte which flows out of the tank by a pipe, and also of a large peroxidized anode and a spongy lead or carbon cathode, through which an electric current passes.

"Electric Gas."

The announcement which is made that several electricians at Springfield, Massachusetts, are hard at work perfecting a process for manufacturing illuminating and fuel gas by electricity, has created a deep interest in the matter, and the outcome will be eagerly awaited, especially by every one engaged in manufacturing enterprises. The new process, it is said, consists in converting oil into vapor by means of heat created by passing an electric current through some foraminous metal, which offers serious resistance to the current so that it is heated to a very high degree. The oil that is preferred for the purpose is crude petroleum, though other similar volatilizable substances will answer. The greatest advantage claimed for this new gas—already designated as "electric gas"—is, of course, its cheapness. Seventeen cents per thousand feet is the maximum estimated cost, and thirteen cents the minimum. Then the apparatus is neither bulky nor complicated. It is asserted that a generator no larger than a common office desk, and very easy to manipulate, will supply gas for light, heat and power for a very large factory.

Applied to Spectacles.

Another of the innumerable developments of electricity now made is that of electric light in surgery. Spectacles (to be used in surgical operations) are lighted by means of a small electric lamp. The lamp is so arranged as to send a beam of cool light on the part to be examined; meanwhile the rims of the spectacles exclude the outside light from the observer's eyes.

WHERE WAS ELECTRICITY FIRST USED?—In reply to the questions by a correspondent, where was electricity first used, and who first sent a telegraph message? the New York *Sun* makes this reply: Thales, a Greek philosopher, who lived 600 years before Christ, is said to have known the electrical properties of rubbed amber. Otto von Guericke, in 1647, constructed the first electrical machine. Franklin, in 1748, killed a turkey by electricity, and roasted it on an electric jack before a fire kindled by the electric spark. Perhaps this was the earliest actual use of electricity. As long ago as 1747 electric shocks were sent over short distances. Relson, in 1794, by using thirty-six wires, one for each letter or character, sent messages over small distances. Morse simplified the telegraph, using only one wire, instead of from thirty to thirty-six wires. His first public message was, "What hath God wrought?" This was on May 24, 1844. Two days later the Democratic Convention in Baltimore nominated James K. Polk for President, and Silas Wright for Vice-President. Mr. Vail, Morse's assistant, telegraphed the news to Morse at the capitol. Morse told Wright, and the convention was astonished to get a dispatch from him declining the nomination. The convention wouldn't believe it, and sent a committee to Washington to get reliable information. This was doubtless the first news telegram sent.

QUEER ANTICS CAUSED BY ELECTRICITY.—The queer antics caused by electricity, which is coming into common use everywhere, are of daily occurrence. One of the latest happened recently at Evansville, Ind. During a heavy storm, a number of electric light and other overhead wires were blown down and crossed, and the electric fluid started out to make things lively about the streets. Sparks were hissing and sputtering in all directions; the fire department was called out, and unaware of the exact state of things, a number of firemen, civilians, and horses were knocked over by electric shocks. Finally a messenger ran to the electric-light station, which promptly shut down, when over a dozen persons were found lying about unconscious and were restored with difficulty, two of the firemen at last accounts remaining in a precarious condition. It is such little occurrences as these which make the firemen and the general public alike distrustful of the overhead wires, look they ever so innocent.

A JAPANESE UNIVERSITY.—The Imperial University of Tokio has 138 professors and teachers, all but 16 being Japanese. This year's students number 788.

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[NEW THIS ISSUE.]
Mining Machinery—F. A. Huntington.
Real Estate—California Land Association.
Books—Henry Carey Baird & Co., Philadelphia, Pa.
Grader and Ditcher—F. C. Austin Mfg. Co., Chicago, Ill.
Board and Lodging—Winchester House.
Mining Property for Sale—"A, M," Grant's Pass, Or.
See Advertising Columns.

Passing Events.

The Milton hydraulic mine, Nevada county, is about to be worked in the same manner as the North Bloomfield—by running the tailings into old excavations, so more of them will go into the mass.

The reports from the Alamo camp, Lower California, are encouraging as to its permanency. At first considered exclusively a placer camp, it is developing into a first-class quartz district, and the mines are yielding very satisfactorily.

There is quite a little local excitement up about Ellensburgh, in Washington. Within the past week some 200 locations have been made in the new placer-fields north of the city, and a hundred locations in the new coal-fields north of the city. The new coal mines show larger veins than those at Roslyn, where 1000 men are at work.

Suits are about to be commenced against the president of the Sutro Tunnel Co. by the stockholders, involving very large amounts of money. Among other things connected with the suits will be a restraining order forbidding the Comstock mining companies paying the royalties. The matter is referred to at length in another column.

Timber Claims and Mines.

We have several times called attention to the fact that much mineral land was being taken up by agricultural claimants in this and other Pacific Coast States. The difficulty is that no one, unless directly interested, cares to go and swear to the mineral character of the land. The applicant has only to swear that to his knowledge there are no mines or minerals on the land. This is very easy for one to do who knows nothing of mines or minerals, and most of them can do it with a clear conscience. Agricultural claimants seldom have any knowledge of the mineral character of land. The patents therefore issue unless some one owning a mine or claiming mineral ground enters a contest. When these contests are made and the mineral character proven, of course no agricultural patent can issue. Nevertheless a large area of land has been taken up in the manner referred to, contrary to the desire or intention of the Government.

Of late another plan has been adopted by a class of men who are trying to take up mineral ground as timber land. They are entering this as timber land with the idea that, if no contest is made by mineral claimants, they will be able to take it. An instance is given by the Shasta County *Democrat*, which says: "The miners and prospectors of Squaw creek mining district are considerably exercised over what appears to be an attempt of a few schemers to scoop in a large area of mineral land in that district by entering it as timber land. Upon the mountain divide between the head of Squaw creek and that of Clear creek there is considerable pine timber, situated around what is known as Bohemotosh mountain. A company of Oaklanders have surveyors in the field running lines preparatory to locating timber claims thereon. This belt of country is also a mineral zone, which contains rich gold and silver quartz veins, and in which there is a number of promising prospects now being developed. Last week a couple of prospectors placed mineral affidavits on the land, the affidavits setting forth that the land is more valuable for mineral than anything else. In fact, that whole township is a mineral belt, a fact to which a hundred or more miners are willing to make affidavit, and which they ought to do before it is too late. Whatever timber there is ought to go with the mineral that is well known to be there. The Government should by all means preserve the timber for the benefit of the mining interests of that region."

Chalcedonic Pebbles.

We have received from H. Kelley of Adin, Modoc county, some chalcedonic pebbles, closely resembling the nature of an opal. Some of these have been ground and polished, and the surfaces are very beautiful. These are not true opals, but should have a value nevertheless.

Years ago opals of this same kind were found at Mokelumne Hill, Calaveras county, and there was considerable excitement about them. F. L. A. Pioche, a capitalist of this city, became interested, and it was thought at one time that large fortunes would be made from the opals. They had some value as gems, but were not fine enough, though many of them were rather good. Those Mr. Kelley sends us are of the same nature. When the pebbles are ground and polished they are very handsome, but do not have the luster of fire of the true opal. It would seem, however, that the best of these should have some little value as beautiful stones. These specimens are from the fields near Adin, Modoc county.

EUREKA-RICHMOND.—Thomas J. Reid, the surveyor appointed by the Eureka Consolidated Mining Company to investigate the alleged encroachment on their territory by the Richmond people, has filed his report. Ore has been extracted across the dividing line at different points on the sixth level of the Eureka, the excavations ranging from 10 to 50 feet. He estimates the value of the ore extracted at about $40 per ton, but has not yet calculated the quantity.

A VALUABLE ledge of sandstone for building purposes has been found on the ranch of S. D. Paxton, six miles from Ukiah, and it is said to be found in immense quantities.

THERE are only 31 men in all employed in the Bodie Con. and Mono mines at Bodie.

Mines and Miners on the Yukon.

Some uneasiness has been felt about the miners who are to winter on the Yukon river, Alaska, and its tributaries, especially those on the Stewart river and Forty-Mile creek. It was thought they were short of supplies and suffering would ensue. Chas. B. Sperry has just arrived from the various camps along the Yukon, having started from Stewart river, 1800 miles up the Yukon. This river, he believes, is the coming mining center. It runs through a fine bottom, from three to ten miles wide, and anywhere in the gravel color can be found. The only places where it pays to work are the points of bars, where gold is lodged along the edges. The only time the bars can be worked to advantage is during low water. The best average is sixty days' work. The hardier vegetables may be raised on the Stewart river bottom. In the fall Mr. Sperry went to Forty-Mile creek, 120 miles below the Stewart river, and looked it over. From there he went to Seventy-Mile creek, which is 50 miles below. He did not like either place, and returned to Stewart river and wintered there with only nine men. This was two years ago and the winter was a mild one.

The third year he spent on Stewart river until July 1, 1888, when he left on account of the destruction of a wheel which he had built for raising water.

The only mines that are paying at Forty-Mile creek are the potholes in bedrock that are filled with blue mud, carrying coarse gold. This has to be worked under the ice early in the spring or through the winter. Besides these the Bonanza and Franklin gulch mines are paying better and better every year, for the reason that they are getting the moss and timber off the ground and the frost is getting out.

The spring was passed on Stewart river in building wheels. Three large wheels were put up for the purpose of working low-grade dirt off high banks, but owing to the frost in the ground they were all failures. The most extensive prospecting being done in the country is at the head of Stewart river by McDonald & Ellis. The first prospect ever struck above the falls, 240 miles up Stewart river, was late last fall, when they picked gold outside of a gravel flow. Great hopes are entertained that these parties will strike places which it will pay to mine.

There are now about 250 miners on the whole of the Yukon, and even if the Alaska Commercial Company should be unable to get any supplies up the river there will be plenty of time for all the miners to get to the mouth after it is too late for the steamboats to get up. The story of starvation and scurvy among the miners is without foundation. There is a surplus of food supply, as the country affords plenty of moose and caribou meat, which can be bought of the Indians for a song.

The men at Forty-mile creek and on the river are all well, and there was a plentiful supply of provisions for the time being. Harper, one of the agents of the Alaska Fur Company, was on his way up the river to establish a post at the mouth of the Heller river, which is 1000 miles above Stewart river. To get there he had to pass Forty-mile creek, and if the men were in want he could have furnished them with plenty of provisions.

LIENS ON MINING PROPERTY LAWFUL.—The Supreme Court affirmed the decision of the lower court in the case of the California Powder Co. vs. the Blue Tent Consolidated M. Co., limited. The action was brought by the powder company to recover judgment for the balance due for powder and other explosives sold to the mining company and used on defendant's property in Nevada county, and to enforce a lien therefor on the property. Judgment was rendered by the lower court in favor of the plaintiff for the full amount and attorney's fees, and the defendant appealed from the judgment and order denying a new trial, admitting the debt, but claiming that a lien on the property was not lawful.

THE shipments of quicksilver from the mines near Calistoga for September were 709 flasks. One company paid a $10,000 dividend.

BABY LEWIS of Grass Valley carried off the first prize at the Fresno Fair. Its father is a miner in the Idaho mine.

The Sutro Tunnel Company.

On Wednesday afternoon legal notices were served upon the following Comstock mining corporations and companies: Consolidated California and Virginia, Chollar, Potosi, Best and Belcher, Alpha Consolidated, Belcher, Bullion, Challenge Consolidated, Confidence, Consolidated Imperial, Crown Point, Exchequer, Gould and Curry, Hale and Norcross, Kentuck, Mexican, Ophir, Savage, Overman, Sierra Nevada, Segregated Belcher, Union Consolidated, Utah, Occident and Yellow Jacket. These notices were to the effect that the companies must pay all royalties to the treasurer of the Sutro Tunnel Co., and not to the Union Trust Co., or the Comstock Tunnel Co. of New York, or its agents.

The companies were notified that certain stockholders of the Sutro Tunnel Co. intend to bring an action, and, if successful, the companies would be held responsible for all moneys due under the contract. The notice says:

"The undersigned stockholders will bring an action against the said Union Trust Company and Comstock Tunnel Company, Theodore Sutro and other persons who have occupied a trust relation to said Sutro Tunnel Company, and other parties, all of whom have so conspired and combined together as to defraud the undersigned and other stockholders of the Sutro Tunnel Company out of their just rights, by means of a pretended absolute sale of the property, franchises and contracts of said Sutro Tunnel Company, under a decree of foreclosure in favor of said Union Trust Company as successor in interest of McCalmont Bros. & Co., whereas in truth and in fact said mortgage had been settled at a heavy discount, procured in the interest of said Sutro Tunnel Company, and was paid for with money which had been subscribed to the bonds of said Sutro Tunnel Company, and the amount paid by the Union Trust Company for said mortgage consisted of money which had been so raised; and that the object of said action will be to have it declared by a court of equity that the said pretended absolute sale of the property and franchises and contracts of said Sutro Tunnel Company is fraudulent and void as against said corporation and the stockholders thereof, and particularly against stockholders who had not subscribed to said bonds; and that said sale has no other effect in equity than as a mortgage to secure the just indebtedness of the Sutro Tunnel Company, to be ascertained by an equitable accounting thereof."

Academy of Sciences.

At a meeting of the Academy of Sciences on Monday evening a series of photographs was exhibited, showing certain cacti which are found nowhere except in Lower California. One of these will probably be called the caterpillar cereus, because it lies prostrate on the ground for some four or five feet and then lifts a shoot into the air. When one end is dying the other is in lusty life. A photograph of the wild date, or Yucca plant, not the ordinary variety, was shown. Dr. Behr, the well-known botanist, said the scenery in which the varieties photographed were found very much resembled parts of Southern Australia. He inferred that climatic conditions were similar. This, he said, was only another evidence of the influence atmospheric peculiarities have on vegetable production. In Southern Australia there is a grass which is much like the caterpillar cereus of Lower California.

The question came up as to the truth of the story about the bird called the California road-runner and its supposed habit of building a corral of cactus burrs or spines around a sleeping rattlesnake, so that when the snake attempts to escape it is impaled. Dr. Behr did not believe that this legend was true. He also expressed an opinion that if the cactus plant had no spines it would long since have become extinct. All vegetarians, whether human or brute, are fond of eating the cactus. Indeed, in some localities various beasts and birds look to the cactus for a supply of moisture to sustain organic life. In some parts of South America there is a cactus which has no spines, but it is found where vegetation is abundant and the cactus itself is not depended on for a source of moisture. In the North American deserts a cactus without spines would soon be exterminated. Dr. Behr thought that after a more complete investigation it might be found that the spines of the cactus were intended in part as a protection from birds and snakes.

It was stated that in Lower California rats build immense nests of the cactus. How they can do so without being stuck full of the barbed spines is a mystery naturalists have not solved.

Diamond Mining.

(Continued from page 279.)

All the western portions of the mine, including shafts, tunnels, ladderways, etc., are now lighted with electric lights. The necessary machinery for pulsating the deposit from the washing machines has been erected in a large compound on the floors, convenient to all the washing gears. Additions are being made to increase the capacity of the plant, so that all the deposit from the De Beers and Kimberley mines can be treated and assorted in one place.

During the year 944,706 loads of blue ground have been hauled, yielding 914,121 carats of diamonds, which realized £901,818. The average yield per load is 1283 carats.

The average number of native laborers employed (exclusive of white workmen) is 2100. There are also 300 native convicts in the mine.

The president of the company states that they are making a profit of 66 per cent on their working at the present price of diamonds. In his address at the annual meeting he said: As far as the stability of the mines is concerned, there can be no doubt about that, because we have before us ample proof to show that the present generation need not fear for this, and in referring to the industry I mean the market for diamonds, for without a market our products would be useless. I have not the exact figures for 1876, as up to then no official returns were made, but I can give you the figures from 1883. From 1873 to 1880 I think the demand was not more than about a million and a half per annum. In 1876 the diamond production was about one and a half millions. I am uncertain about the period prior to 1876, but from then to 1880 I am perfectly certain of, as I was a very important factor in the diamond trade at that time. When we came to the year 1883, when the first official returns were kept, we find that the production was 2,319,234 carats, the valuation being £2,359,466, or an average of 20s. 4¼d. per carat, so that we find the demand for diamonds in 1883 was in rough figures about two millions.

In the year 1884 the production was 2,264,786 carats, valued at £2 562,623, the average per carat being 23s 2¼d. In 1885 the production was 2,287,261 carats, valued at £2 228,678. In 1886 there was an increase and I mention this simply to show that the more the production increased the price has risen in proportion, and I refer to these figures to show that the demand for diamonds has steadily increased. In 1886 the production was 3,047,639 carats, which realized £3 261,505, or an average of 21s 6d per carat. In 1887 we find the production was 3,646 889 carats, which realized £4,033,582, and the following year the production was 3,565,780 carats, realizing £3,608,217, bringing the total value for the last two years up to £7 641,799, the average being more than 20s per carat, so that the average for the last two years was within £200,000 of four millions. These were the prices diamonds were realizing before the unification; these were the prices diamonds were fetching when there were 200 or 300 different interests, when the mines were in the hands of individuals and small companies that were compelled to put their diamonds on the market and were forced to sell under circumstances not at all advantageous, because from time to time, as many of you remember, these small companies were in debt, and the diamond buyers took advantage of the situation. Just upon 4,000,000 was the production in 1888 and the price was over 20s per carat, and, unless I am mistaken, that was the year that the fight was going on between the Kimberley and De Beers mines. Diamonds were being produced wholesale and thrown upon the market, and yet after all these conflicting interests had been working against each other, the average for diamonds was some 20s per carat. Since the Kimberley mine has become the property of the De Beers consolidated mines, instead of producing the number of carats we have produced a lesser quantity and received the same amount of money for them; that will allow for the increase of blue on our floors. You see our diamonds to-day since we have had absolute control of the De Beers and Kimberley have realized 27s 6d per carat from April to June, and this month our diamonds have realized 30s per carat. I may tell you that it is not the intention of the directors to raise the price of diamonds beyond 30s, as we are making now a profit of about 66 per cent on our working.

Foundry Notes.

A very large lathe has been completed at J. B. Jardine's Atlas Iron Works for turning piles to be fitted with Anderson & Elias' patent teredo-proof iron jacketing The lathe is 58 feet long and will turn a pile 50 feet long and of any ordinary diameter. In order to fit the iron jackets properly, the pile must be smooth, and this lathe was devised for this purpose. The lathe will be placed at the yards of the Anderson & Elias Co. at North Beach. The pile will be hauled from the water direct into position in the lathe. The cutters are self-feeding and move along from end to end of the lathe with rapidity. This is the first attempt to turn such large timbers in a lathe, and it can be applied to spar making without any change. A public trial was made this week, at which the Harbor Commissioners and others were present. The lathe is said to be the largest ever made, and works very satisfactorily.

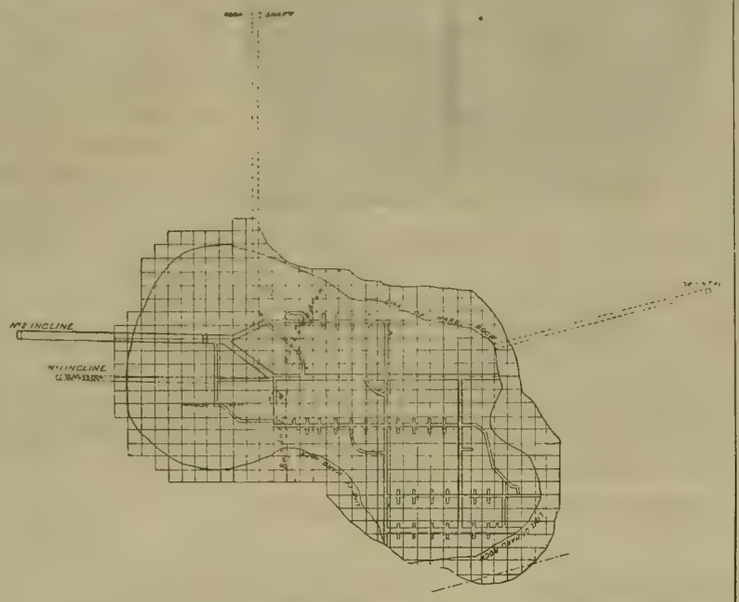
Nearly all the tools and machines have been removed from the old shop of the Atlas Iron Works, on Mission street, to the new works on the Potrero, where Mr. Jardine will have much better facilities for carrying on business. Having now a water-frontage, he can do his marine work and repairing to better advantage.

F. A. Huntington & Co. received the gold medal at the Mechanics' Fair for the best display of mining machinery in operation.

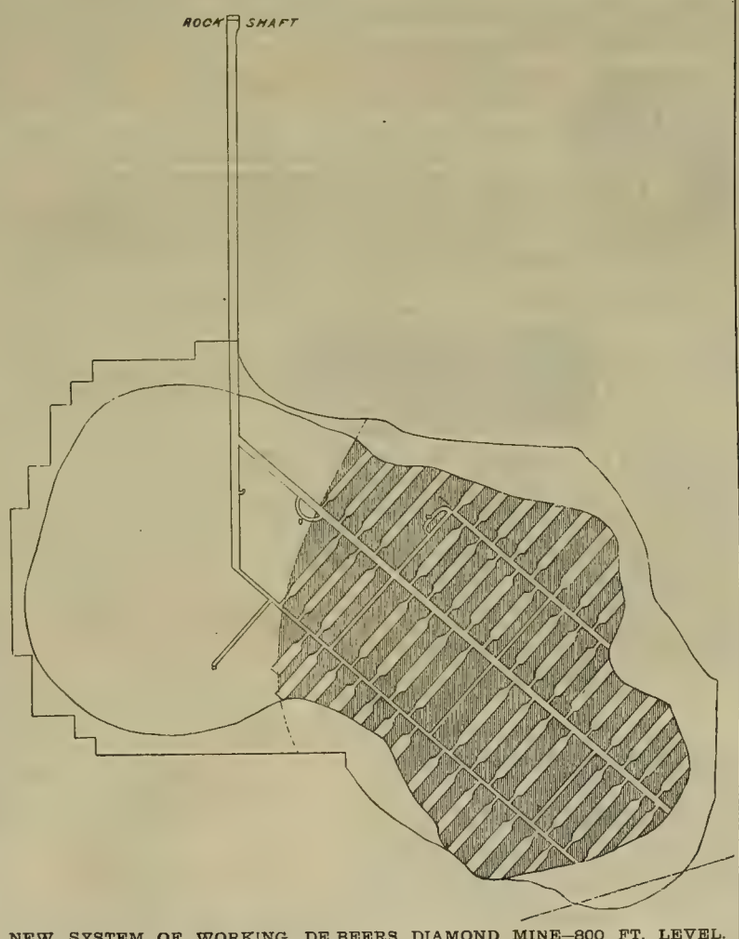
The Risdon Iron Works were awarded a silver medal at the Mechanics' Fair for the best quartz-mill in operation. This was the Bryan Roller quartz mill.

The Joshua Hendy Machine Works obtained a bronze medal at the Mechanics' Fair for the best ore-feeder—the Challenge.

It will be remembered that some months ago a Chinese syndicate purchased a half interest in the mines in the Masac concession in Lower California. Wo Mon Sing, the head of the syndicate, has returned to San Francisco to purchase a large quantity of mining machinery which will be used in crushing the ore from the Pueblo mines in Canada Rica, about two miles from Real del Castillo. A flume five miles long is nearly completed, which will furnish water to the mines. The Chinese have invested already $40,000, and will spend some $250,000 altogether. Our local foundries will reap a benefit in the manufacture of the mining machinery.



PLAN OF DE BEERS MINE—PRESENT SYSTEM OF WORKING—700 FT. LEVEL.



NEW SYSTEM OF WORKING DE BEERS DIAMOND MINE—800 FT. LEVEL.

Astronomical.

The Astronomical Society of the Pacific, which was founded in this city last February, now has 145 members, and is in a flourishing condition. It was the result of the co-operation of professional and amateur astronomers in successfully observing the total solar eclipse of New Year's Day, and the association is continued both as a scientific and social force. The new society is designed to be popular in the best sense of the term. Any person who takes a genuine interest in astronomy is invited to join its membership, whether he has made special studies in this direction or not. It is believed that every such person will get, and will feel that he gets, a full return from the society, through its meetings, or through its publications. Three meetings a year (March, November, January) are held in San Francisco, at the rooms of the society (408 California street); and three meetings (May, July, September) are held at Mount Hamilton—where an opportunity is afforded to the members to see and use the instruments of the Lick Observatory.

The *Publications* are printed in octavo form at irregular intervals; 100 or more pages a year may be expected. The *Publications* contain papers read before the society (either in full or in abstract), plates, etc., the minutes of the meetings; and also *Notices from the Lick Observatory*, which are brief and popular accounts of the current work of that establishment, prepared by members of the Observatory staff. Such notices have previously been printed in various astronomical journals, but in future can be found in full only in the *Publications*. It is quite a help to the new society to have the Lick Observatory work recorded in its proceedings and published by it, and will have the effect, doubtless, of largely increasing its membership. There are no initiation fees, and the dues are only $5 a year. The secretaries are Charles Burckhalter of the Chabot Observatory, Oakland, and J. M. Schaeberle of the Lick Observatory.

The Lick Observatory, by sanction of the Regents of the University, has published the "Reports on the Observation of the Total Eclipse of the Sun of Jan. 1, 1889." Professor Holden has contributed an excellent article, giving the results of the observations and an analysis of the different photographs made by the professionals and amateurs. Some of the best photographs are figured. Those presenting accounts of their individual observations are J. M. Schaeberle, Jas. E. Keeler, E. E. Barnard, C. B. Hill, A. O. Leuschner, Charles Burckhalter, Mary K. Curran, G. W. Dornin, Clark L. Goddard, W. C. Gibbs, C. P. Grimwood, J. H. Johnson, O. V. Lange, W. H. Lowden, C. F. Montealegre, W. L. Oliver, S. C. Passavant, W. M. Pierson, G. W. Reed, G. Tasheira, A. J. Treat and E. L. Wood. The reports are of various lengths and all of more or less scientific value. Published at Sacramento at State Office, by J. D. Young, Superintendent State Printing.

The results of experiments made with samples of gas coal recently sent New York from veins tributary to the Clinch Valley division of the Norfolk & Western railroad, Virginia, established the fact that they will command a share of the business now enjoyed by the Pennsylvania, Westmoreland and Youghiogheny coals in all the Eastern markets. They are equal in quality to the best coals in the districts named, and are thought by experts to be superior to the best coals mined on the Chesapeake & Ohio and Baltimore & Ohio roads.

There are 197 stamps now dropping on Comstock ore in the following mills: California, 70; Morgan, 44; Brunswick, 20; Occidental, 20; Alta, 15; Justice, 10; Hully, 5; Fisher, 4; Pfleifer, 4; Courser, 5. The above crush daily about 500 tons.

Arrangements have been made to have Gabriel, the old Indian at Monterey, who is said to be 150 years old, brought to this city, and next week he will receive callers at the rooms of the State Board of Trade on Market street.

THE California Automatic Can Company, which has bought the right from the Boston Company for the Pacific States, Alaska and British Columbia, may justly be reckoned among the chief industries of the State. It is the only company of the kind in the world manufacturing cans for packing fruits within the legal requirements of the late enactments of France and Germany, and which will soon be adopted in this country, Charles J. King, Secretary of the California Canned Goods Association, being at present engaged with that end in view. The process by which these cans are manufactured is unique and ingenious. The factory is on Brannan street, between Third and Fourth, the company having leased a portion of the factory of A. Lusk & Company, where the doors are always open to those interested in the State's institutions and progress. This remarkable machine began work on the 15th of July, since which time it has turned out about 2,500,000 cans. The process is begun by a set of steam scissors cutting a piece of tin 14x20 into four parts which is passed to a feeder, then fed by a rosin flux of oil, instead of acid, as of old; then by means of clamps on a revolving wheel the can is formed, carried through its various processes by means of steam tramways to the finishing touch, a hydraulic machine which dips it into hot water and subjects it to a test pressure and lastly deposits it in crates a perfect can for fruit-packing made without any inside solder and free from acid.

Assessment Notices.

Lapanta Consolidated Mining Company.

Location of principal place of business, San Francisco, California. Location of Works, Hawthorne Mg Dist., Esmeralda Co., Nevada.

NOTICE is hereby given that, at a meeting of the Board of Directors, held on the 2d day of October, 1889, an Assessment, No. 2, of Two Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin, to the Secretary, at the office of the Company, Room 56, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 8th day of November, 1889, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the 2d day of December, 1889, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

J. STADTFELD, JR., Secretary.

Office, Room 56, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

HORACE D. RANLETT,

Ores, Mining, and Commission,

420 Montgomery St., S. F.

Ships under advances to smelting works in Boston, New York, Baltimore and Liverpool.

Twenty-one years' experience in Shipping Ores and Managing Mines.

Solicits Consignments of Copper Produce and Management of Mining Matters.

All business conducted on Cash Basis.

Purchase and shipment of Mining Supplies A SPECIALTY.

Sales of Developed Copper Mines undertaken.

Business Manager of UNION COPPER MINE, Copperopolis, Cal.; NEWTON COPPER MINE, Amador Co., Cal.

Tioga District Mining Company,

Incorporated June 11, 1889 Capital Stock, $10,000,000

BUY AND SELL

California Gold, Silver, Quicksilver, Copper and Lead Mines

OF ASCERTAINED VALUE.

Office, No. 13 PARROTT'S BUILDING, N. W. Corner of California and Montgomery Streets, SAN FRANCISCO, CAL.

WM. B. WIGHTMAN, Pres. WM. H. V. CRONISE, Sec.

GOLD MINE WANTED.

Owners of a good, well-developed, free-milling gold mine, that can be run with water-power, who are willing to give an interest for the erection of a new stamp mill and machinery, can address, A. B. C, 326 S. Fort St., Los Angeles, Cal. Give full particulars. Owners only treated with.

Smelter For Sale or Exchange.

One 50-ton, wrought iron, water-jacket Smelting Furnace (36"x60" at the tuyeres) of the latest design, with Crusher, Blower, Boiler, Pumps, Engines, Tools, and everything complete for immediate delivery, and only used about six months. Cheap for cash, or will exchange for interest in a Lead-Silver Mine, or erect in any mining camp that will guarantee a certain output. For further particulars address Box 28, Elkhorn, Montana.

FOR SALE.

One 10x13 inch Clayton Belt Air Compressor.
One 8-inch Sergeant Drill.
One 6-ft. Double Screw Drifting Column with Arms.
One 4-ft Single Screw Stoping Bar.
One 3½x13 ft. Air Receiver.

The above are in first-class condition and will be sold cheap. For price apply to the PAYMASTER MINING CO., Yuma, Arizona Territory.

THE RUSSELL PROCESS COMP'Y.

TALCOTT H. RUSSELL, Secretary,

NEW HAVEN, CONN.

P. O. Box 496.

RUBBER FACTORY.



Monarch Belting.

The Ends of this Belt are

UNITED by COTTON RIVETS

Which hold them firmly together.

Each Rivet is Independent

And Follows the Stretch.

THERE ARE NO STITCHES

TO BREAK, and

The Belt has a Smooth Surface.

Hose, Belting, Packing, Etc.

ALL KINDS OF RUBBER GOODS MADE TO ORDER IN A FEW HOURS.

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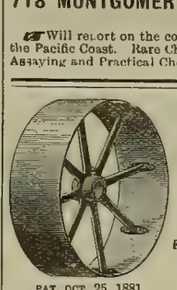
HENRY G. HANKS,

Practical and Industrial Chemist, Assayer and Geologist,

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☞ Will report on the condition and value of any mining property on the Pacific Coast. Rare Chemicals made to order. Instructions given in Assaying and Practical Chemistry.



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First Premium Awarded at Mechanics' Fair, 1884.

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For the States of California, Oregon and Nevada, and the Territories of Idaho, Washington, Montana, Wyoming, Utah and Arizona. Lightest, Strongest, Cheapest and Best Balanced Pulley in the World. Also Manufacturers of

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☞ SEND FOR CIRCULARS AND PRICE LIST. ☜

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"RED FLAX" TRADE MARK RED CORD CORD"

SQUARE FLAX PACKING,

Manufactured from strictly first-class Flax and pure lubricants. Superior to all others for water and steam. Packs with less friction and makes a tighter joint than any other packing made. ☞ Imitations of inferior quality having been put upon the market, we have been compelled to adopt the above trade mark, and all of our packing will now have a RED CORD running through the center its entire length. See that you get it and take no other. Sold by all Hardware dealers. Price 50 cents per pound. W. T. Y. SCHENCK, Sole Manufacturer, 232 and 234 Market Street, San Francisco, Cal.

ENGINE FOR SALE.

A Double Compound Automatic Engine,

SHORT STROKE.

ABOUT 190-HORSE POWER.

For Less Than One-Half Its Value.

—APPLY TO—

CAPITOL MILLS,

114 and 116 Sacramento Street, S. F., Cal.

FRANCIS SMITH & CO.

Manufacturers of

Sheet Iron and Steel Pipe

ALL SIZES.

130 Beale Street, San Francisco, Cal.

Iron cut, punched and formed, for making pipe on ground. All kinds of Tools supplied for making Pipe. Estimates given. Are prepared for coating all sizes of Pipe with a composition of Coal Tar and Asphaltum.

QUICKSILVER.

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FOR SALE CHEAP.

One new double circular Sawmill to carry 60-inch bottom saw, with wrought-iron hangers for top saw. Friction feed-works, patent steel screw double-throw head-blocks, with track iron, saw carriage and frame complete

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Pacific Coast Agents.

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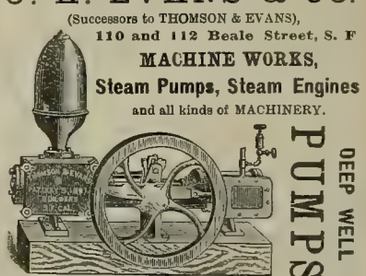
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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCT. 1, 1889.

412,059.—ELEVATOR SAFETY DEVICE—Henry Albert, Crescent City Cal.

412,066.—SAFETY GAS-COCK—J. P. Becker, S. F.

412,172.—SEPARATOR—J. M. Finch, Crockett, Cal.

411,860.—TRIP-HOOK FOR HAY ELEVATORS—C. Hamaker, Bonanza, Or.

411,988.—MUSTACHE GUARD—M. E. Harrington, Oakland, Cal.

412,087.—DERRICK—Jas. B. Harrison, San Jose, Cal.

412,093. HINGE—Carl Jaenig, S. F.

412,094.—PHOTO-PRINTING FRAME—Geo. A. James, S. F.

412,099.—WIND-WHEEL—John D. Keller, S. F.

412,102.—SWATHER—W. H. Lamrock, Coyote, Cal.

412,131.—FRUIT-DRIER—D. L. Smith, S. F.

412,050. VEHICLE AXLE—P. Somerville, S. F.

19,332. DESIGN—J. P. Kerr, San Jacinto, Cal.

The following brief list by telegraph, for Oct. 8th, will appear more complete on receipt of mail advices:

California—Carl Blomquist, Pescadero, coupling keyboard for organs; Walfred Barkman, assignor to C. H. Frost, Los Angeles, clay reducer; Manuel Corranza-Guatemala, and J. M. Tiaveo, San Francisco, electric igniting device for lamps; Henry T. Hayes, Oakland, fire-ladder; Jonathan S. Jaquith, Sierra City, tool handle; George H. Little, Los Angeles, agricultural machine; Joseph Lyman, San Jose, book stapling machine; Pedro Napoles, Napa, distilling apparatus; James Tullock, Angels' Camp, ore concentrator; Frank Wilcomb, San Francisco, assigned to Wilcomb Knitting Machine Co., Jersey City, N. J., knitted undershirt.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable prices, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

WIND WHEEL.—John D. Keller, S. F. No. 412,099. Dated Oct. 1, 1889. This invention relates to the class of wheels specially adapted to be run by wind-power, and the invention consists in the novel constructions and arrangements whereby the blades, wings, or fans of the wheel are made to open to catch the wind above and to close up in coming against the wind below. The object is to provide a wheel of this class, which by reason of its adjustable blades or wings shall present as little surface in coming against the wind below as possible, thereby reducing the resistance to its rotation, and which shall, when in the wind above, spread its blades out to their full capacity for taking all the wind.

VEHICLE AXLE.—Philip Somerville, S. F. No. 412,050. Dated Oct. 1, 1889. This invention relates to that class of axles for vehicles in which independent wheel-carrying spindles are properly journaled in the ends of the axle. The object of this invention is to provide an axle of this class in which the connection of the wheel-carrying spindles and the axle is a simple and effective one, permitting their ready adjustment and oiling.

DERRICK.—James B. Harrison, San Jose. No. 412,087. Dated Oct. 1, 1889. The invention consists in a novel construction and arrangement of parts, the object of which is to enable the load to be raised and simultaneously turned to a varying position of discharge, as may be desired. By reason of the construction a balance is given to the machine, the strain on the hoisting-rope at one end of the beam or boom balancing the strain of the load on the other end, so that the entire device operates and moves easily.

SAFETY GAS-COCK.—Johannes P. Becker, S. F. No. 412,066. Dated Oct. 1, 1889. This is one of that class of safety cocks in which spring-controlled catches mounted upon the rotary valve stem of the cock are adapted to engage with notches in a flange on the base of the valve seat, whereby the valve is locked in closed position. The object is to positively lock the gas-cock in a closed position so as to prevent the escape of gas by the accidental turning or movement of the valve after it has been closed.

PHOTOGRAPHIC PRINTING FRAME.—Geo. A. James, S. F. No. 412,094. Dated Oct. 1, 1889. It has been customary to make the frames for the printing of photographs of wood, having a wooden holding-plate hinged in the center and provided with springs, which keep it pressing against the negative and the sensitized paper after these have been placed in the frame. The hinge is intended to allow a portion of the plate to be turned back and examined from time to time to ascertain the progress of the printing, the half that remains fastened retaining the paper in its proper relation to the negative while this is being done. In the construction of these frames they must be made of considerable thickness, and it is not possible to turn the hinged plate back sufficiently to enable the operator to obtain a good view of the print on account of the thickness of the plate, and for the same reason great care must be taken to expose the same squarely to the light of the sun, in order to prevent the projecting thickness of the edges from casting shadows, which will spoil the print. Mr. James makes his plate-holders of thin but stout metal and has made other improvements which overcome objections to the ordinary form of plate-holder.

ELEVATOR SAFETY DEVICE.—Henry Albert, Crescent City, Del Norte county, Cal. No. 412,059. Dated Oct. 1, 1889. The invention is an improvement in the reversible catches patented by the same inventor April 5, 1887 (No. 360,504), and also in connection with said catches of novel clamps dependent for their operation upon the reversible catches and adapted to bind upon the sides of the shaft or well-timbers, whereby additional security is rendered and much of the weight taken from the catches. The object of the invention is to provide a safety appliance for elevators of a character simple in construction and efficient in operation.

HINGE.—Carl Jaenig, S. F., assignor of one-half to Max Pauly. No. 412,093. Dated Oct. 1, 1889. A strap adapted to be screwed to one of the parts to be hinged has a projecting disk formed upon it; another similar strap with a similar disk is secured to the opposing part. The disks project sufficiently to overlap the opposing straps, and they are united centrally by a pivot pin or bolt. In one of the disks is an elongated slot through which passes a thumb-screw. By loosening this screw the two straps may be moved apart or brought together, turning about the pin as a center, and by tightening the screw the hinge is locked and the straps are held in the position to which they are adjusted. This hinge may be applied to many purposes, but is specially useful for step ladders, since it will hold the two parts of the ladder at any desired position.

SEPARATOR.—John M. Finch, Crockett, Contra Costa county, assignor of part to John R. Cross of San Francisco, Geo. Riley of Vallejo and Frank Miller of Marysville. No. 412,172. Dated Oct. 1, 1889. This invention relates to the class of machines for the separation of materials according to specific gravity, the separation taking place in a revolving body of air. The object of the invention is to provide a simple and effective machine of this class adapted for the separation of any materials, but principally applicable to mill-stock.

SWATHER.—Wm. H. Lamrock, Coyote, Santa Clara county. No. 412,102. Dated Oct. 1, 1889. This relates generally to the class of mowing machines, and particularly to that class of attachments thereto known as swathers, the object of which is to turn the grain over into the swath away from the standing grain. The upper directing-arm is pivoted and supported by springs so as to have a freedom of movement which results, by reason of the traveling and jarring of the machine, in a constant vibratory or shaking movement of said arm. In the ordinary swathers the grain falling on the upper portion or upper arm thereof is inclined to stick and will not let go, because the arm is usually rigid; but with this improved vibratory-arm the grain or hay cannot lodge upon it or stick, as it is constantly agitated, and as the weight of the hay or grain is increased, the arm yields sufficiently to make it slip off, which result is assisted by the jarring movement of the arm. This is the principal object, but it subserves a further purpose as follows: In the improved mowing machines now in use, the sickle may be turned downwardly toward the ground to operate upon lower grass, and where the arm of the swather is rigid, it is obvious that said arm is elevated, which makes it more difficult for it to throw the grain off; but with this improved freely moving arm the weight of the grain presses it down, so that it can slip off as usual. There are certain other improvements in construction covered by this patent.

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H. G. PARSONS—Central California.
WM. H. HILLEARY—Oregon.
W. B. FROST—Montana and Idaho.
JUAN C. JENS—New York City.

MINT DIRECTOR.—The President has appointed Edward O. Leach of the District of Columbia to be Director of the Mint vice James P. Kimball of Massachusetts, resigned. Mr. Leach has been computer of bullion in the Mint bureau for many years, and is well qualified for his new position. The appointment meets with general favor in the Treasury Department, being regarded as in the true line of civil service reform, a promotion for merit, and in general one of the best appointments made by the present administration.

CONCENTRATORS.—J. W. Shaw received the medal at the Mechanics' Fair for the best wet ore concentrator; and James B. Freeman for the best dry concentrator.

Mining Personals.

Charles Jacob, a mine-owner of Mokelumne Hill, is in town on business connected with his mines.

J. H. Marriott has been in charge of the Osceola gravel mine, Nevada, for the past five years.

George W. Grayson and A. Borland, two Oakland mining capitalists, have gone to New Mexico.

Charles Brown died at Sitka, Alaska, on Sept. 12th. He went to that country as a prospector in 1861.

Mr. Blandy is industriously at work collecting specimens for exhibition at the Territorial Fair, Arizona.

Allan McDonald succeeds J. K. Pardee to the superintendency of the Iron Mountain mine, Phillipsburg, Montana.

Two hundred dollars a ton is what A. W. Callen is getting out of his Silver Queen mine, Walnut Grove, Arizona.

Maurice P. Hays of Bridgeport, Mono county, has been elected recorder of the new Green creek mining district in that county.

J. K. Owen, who is a well-known contractor for mining machinery, has returned from South America after an absence of two years.

D. B. Lyman, superintendent of the Con. Virginia and California and other North End mines on the Comstock lode, is in this city.

Mr. A. B. Paul is down from Shasta county on business connected with the mine, where he has his dry process of amalgamation in use.

Dominick Briden has been appointed superintendent of the Andes mine on the Comstock. The former superintendent was Oscar Steele.

John Branon, for a long time an employe at the Sierra Buttes mill, has gone up to take charge of the Young America mill, Sierra county.

M. L. Elliott has returned to Grass Valley from Amador county. He has resigned the superintendency of the Keystone mine of Amador.

Postmaster C. R. Clarke of Nevada City opened the first hydraulic mine in Central America—the Malpaso, State of Tolima, U. S. of Colombia.

J. E. Fillmore has resigned the position of shift-boss at the Omaha, Nevada county, and gone to take the place of foreman at a mine in Monterey county.

The suit instituted by P. J. Keyes against the Keyes Mining Co. to recover $4000 said to be due him for salary, etc., has been dismissed, Mr. Keyes having withdrawn from the suit.

G. S. Check of this city is said to have gained the support of Kansas City capitalists in his scheme of working refractory ores at a cost of only $3 per ton. The process which he claims to have discovered is a secret one.

A. Rocco, for 14 years past superintendent of the Great Western Quicksilver Mining Co., goes to Mexico to manage a quicksilver mine and a group of silver mines owned and controlled by Signor Romero Rubeo, Secretary of State of Mexico.

F. Chappellet has resigned as acting superintendent of the Mayflower mine, Placer county, and a gentleman named Beach of Spokane Falls has been selected for the position. Mr. Chappellet will, however, remain at the mine for some months, but he will devote himself chiefly to the development of the Eureka mine.

William Armstrong, says the Virginia *Enterprise*, formerly superintendent of the Brunswick mill on the Carson river, but now superintendent of the Jesus Maria mine in the State of Chihuahua, Old Mexico, wrote to Hon. F. P. Langan to send him a number of Comstock miners—that he couldn't get along without them. He promised them six months' work at $4 a day, payable in U. S. gold coin; they must pay their fare out, but after working six months they will be entitled to draw on the company for the same. In accordance with the foregoing terms Randall Campbell, Sam Smith, Thomas Poynton and Michael McCullom, all first-class men and miners, have signed to go.

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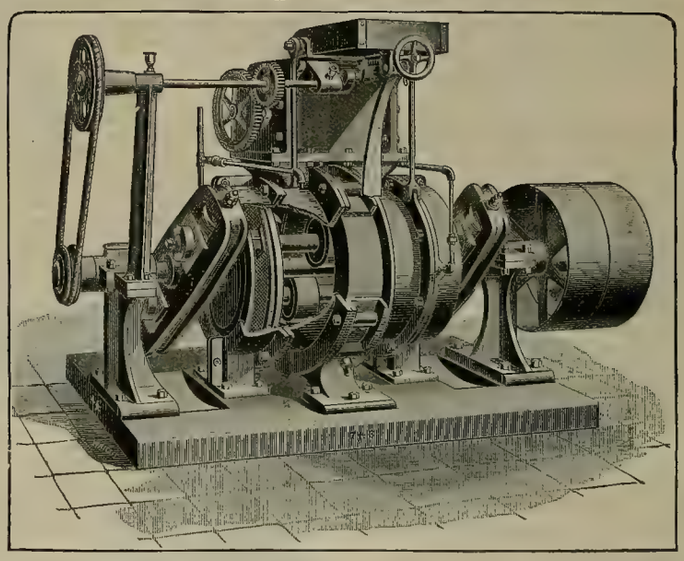



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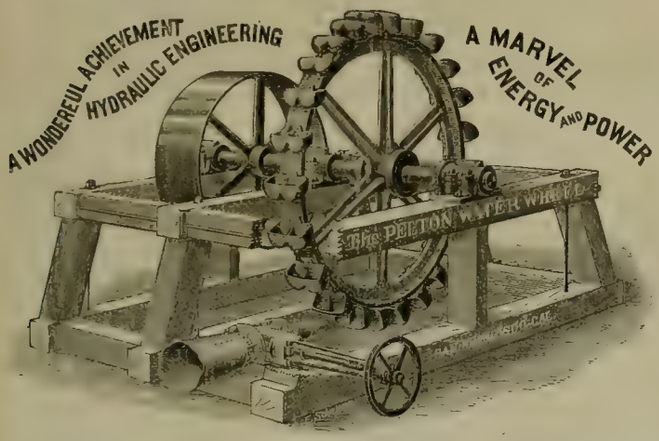
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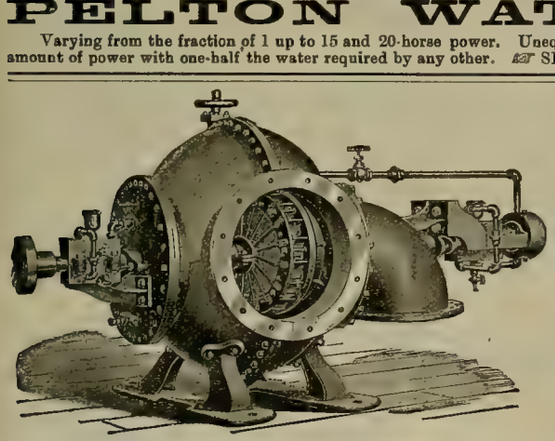
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Varying from the fraction of 1 up to 15 and 20-horse power. Unequaled for all light-running machinery. Warranted to develop a given amount of power with one-half the water required by any other. ☞ SEND FOR MOTOR CIRCULAR. ADDRESS AS ABOVE. ☜



JAMES LEFFEL'S
Mining Turbine Water Wheel.

These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

JAMES LEFFEL & CO.,

Springfield, Ohio, or 110 Liberty St., New York.

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HENRY J. ROGERS & CO.

Successors to CHAS. CALLAHAN

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SECOND-HAND BOILERS AND OLD MACHINERY

Of every description.

The Highest Price paid for all kinds of Metals.

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GOLD AND SILVER REFINERY And Assay Office.

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Standard Shot-Gun Cartridges,

Under Chamberlin Patent.

JOHN TAYLOR & CO.,

IMPORTERS AND DEALERS IN

ASSAYERS' MATERIALS, MINE AND MILL SUPPLIES,

ALSO CHEMICALS, AND PHYSICAL, SCHOOL AND CHEMICAL APPARATUS.

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We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price. Our New Illustrated Catalogue, with prices, will be sent on application.

☞ Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England. Also for E. G. Dennison's Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices.

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Nevada Metallurgical Works.

NO. 23 STEVENSON STREET,

Near First and Market Streets, S. F.

C. A. Luckhardt, Manager. Established 1869

Ores worked by any Process.

Ores Sampled.

Assaying in all its Branches.

Analyses of Ores, Minerals, Waters, etc.

Working Tests (practical) Made.

Plans and Specifications furnished for th most suitable Process for Working Ores.

Special attention paid to Examinations of Mines; Plans and Reports furnished.

C. A. LUCKHARDT & CO.,

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Mining Engineers and Metallurgists.

J. KUSTEL. H. KUSTEL.

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PERFORATED SHEET METAL

For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass, Zinc and other metals punched for all uses.

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Orders promptly attended to.

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JOHN W. QUICK, Proprietor.

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Oct. 10, 1889.

Trade the past week was fairly active in all lines. Iron-workers and manufacturers in general report more activity in their branches of trade. The local money market is easy, with Eastern banks carrying a handsome surplus. This is reflected in the annual statement of the Bank of California and Nevada bank, which gave the cash on hand at over $3,200,000. The first named had over $1,900,000, and the latter over $1,300,000. The two banks also report good remunerative business for the past year. Remittances from the interior are steadily increasing. The demand for exchange on New York is still fairly active.

MEXICAN DOLLARS—The demand the past week has been good from the Chinese, but only fair from banks. The price now quotable is 75¾@76c.

SILVER—The market is very strong at 94c bid, with holders asking more money, owing to the steamer for China leaving on next Thursday, and also to to the strong advancing market abroad for silver. The growing favor with which bi-metallism is received in this country and abroad is undoubtedly having a beneficial effect on the market. Leading English mono-metallic papers are advocating the Bank of England retaining part of its reserve in silver. From the favor in which this is received, we judge it is only a question of a short time when the bank adopts the suggestion, which will be quite a victory for silver.

QUICKSILVER—Receipts the past week aggregate 261 flasks. The market is barely steady. The demand is still light.

LIME—Receipts the past week aggregate 4285 bbls., and exports by sea 825 bbls. to Honolulu. The market is still active, but in prices it is reported that there is some cutting.

BORAX—Receipts the past week aggregate 220 centals. The market is steady at unchanged quotations.

TIN—Imports the past week aggregate 45,474 boxes, and exports by sea 4320 lbs. of plate to Victoria, and 11,000 lbs. to Liverpool. Our market is reported dull, as large consumers are not disposed to buy much even at the present low parity of spot prices. For shipment no orders are obtainable, owing to buyers not having confidence in the stability of the market abroad. Our last cable advices gave a stronger market.

COPPER—The market is virtually unchanged. It is very difficult to obtain reliable information regarding the situation abroad, but that obtainable points to an early and satisfactory agreement between all disputing interests, yet even with a final settlement it is not the intention to advance prices.

IRON—Imports the past week aggregate 100 tons of pig from Irondale and 1537 tons from England. The market is quite active, with supplies going into consumption quite rapidly. The outlook promises higher prices, based on further advances abroad.

The following are the latest comparative quotations f. o. b. at Glasgow:

F. o. b. Glasgow.	Sept. 25, '89.	Oct. 4, '89.
No. 1 Coltness	65s 6d	67s 6d
" Langloan	64s 6d	66s 6d
" Summerlee	64s 6d	66s
" Gartsherrie	62s 6d	65s
At Ardrossa.		
No. 1 Eglinton	50s 6d	53s
" Glengarnock	60s 6d	60s 6d
" Dalmellington	50s 6d	53s

COKE—Imports the past week aggregate 2327 tons from England and 125 tons from Tacoma. For prompt shipment, English coke is higher. The local market is reported strong under an active consumption and supplies well held. The shipment from Tacoma is the first for a long time. As the capacity for the output has been increased by the company at Tacoma, regular shipments are now among the possibilities.

COAL—Imports the past week aggregate as follows: Seattle, 2340; Departure Bay, 2400; Liverpool, 3055; Coos Bay, 1500; Australia, 12,641. Total, 21,936 tons. For shipment, Australian is quoted still higher, owing to a further advance in freights, now quotable at about 18s to this port. In the local market stocks are light, which goes to show that the heavy imports have gone into consumption as fast as received. It is stated that large consumers in the interior who had been holding off, expecting lower prices, have either stocked up or are stocking up. The same remarks apply to a very large number of consumers in this city. Retail dealers are beginning to carry more in stock, owing to families and other small consumers buying their winter supplies.

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$20 00	$17 00
41 to 50 ft	21 00	18 00
51 to 60 ft	23 00	20 00
61 to 70 ft	27 00	21 00
1x3, fencing	22 00	19 00
1x4, "	21 00	18 00
1x3, 1x4 and 1x6, odd lengths	19 00	16 00
Second quality	17 00	15 00
Selected	24 00	22 00
Clear, except for flooring	31 00	28 00
Clear for flooring	2 00	.....
Clear V. G. No. 1 flooring	6 00	.....
Firewood	14 00	10 00
Dressed Pine, flooring, No. 1, 1x6	32 00	29 00
No. 1, 1x4	34 00	30 00
No. 1, 1¼x4, 1¼x6, and odd sizes	37 00	33 00
All sizes, No. 2	27 00	24 00
Stepping, No. 1	44 00	35 00
Stepping, No. 2	34 00	25 00
Ship timber and plank, rough	27 00	18 00
Selected, planed 1 side, av'ge 40 ft	29 00	24 00
" " 2 " " "	31 00	26 00
" " 3 " " "	33 00	28 00
" " 4 " " "	35 00	30 00
Deck plank, rough, average 35 ft	35 00	32 00
Dressed, average 35 feet	40 00	35 50
Pickets, rough, B. M	20 00	16 00
1x1½, 4 ft long, ₩ M	6 50	5 00

Eastern Metal Markets.

By Telegraph.

NEW YORK, Oct. 10, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New ork.	Copper.	Lead.	Tin.
Thursday	42 11-16	93	$10 55	$3 87½	$20 95
Friday	42 11-16	93	10 80	3 92½	20 50
Saturday	42 11-16	93	10 80	3 92½	20 50
Monday	42 11-16	92⅞	10 75	3 95	20 65
Tuesday	42 11-16	93	10 75	3 95	20 70
Wednesday	42⅞	93	10 75	3 92½	21 00

NEW YORK, Oct. 9.—Borax is firm at unchanged quotations. Quicksilver is quiet, but steady at 68@69c. Lead is steady. Consumers are well stocked. Copper after showing considerable activity at last week's prices, is again quiet with an easier tone.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, October 10, 1889.

ANTIMONY	19 @	20
BORAX—Refined, in carload lots	7¼@	7⅝
Powdered " " "	7¼@	
Concentrated " " "	—@	6¾
All grades jobbing at an advance.		
COPPER—		
Bolt	21 @	22
Sheathing	22 @	24
Ingot, jobbing	15 @	16
do, wholesale	13 @	14
Fire Box Sheets	22 @	24
LEAD—Pig	4½@	—
Bar	5 @	—
Sheet	7 @	—
Pipe	6 @	—
Shot, discount 10% on 500 bags Drop, ₩ bag	1 45 @	—
Buck, ₩ bag	1 65 @	—
Chilled, do	1 85 @	—
STEEL—English, lb	16 @	20
Canton tool	9 @	9½
Black Diamond tool	8 @	9½
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4½@	—
TINPLATE—B. V., steel grade, 14x20, P. S	4 85 @	—
B. V., steel grade, 14x20, spot	4 85 @	4 90
Charcoal, 14x20	6 25 @	6 75
do roofing, 14x20	5 12½@	5 25
Pig tin, spot, ₩ lb	21 @	21½
COKE—Eng., ton, spot, in blk & aks, resptvly	17 00 @	20 00
Do, do, to load	13 50 @	14 50
QUICKSILVER—*By the flask*	— @	47 50
Flasks, new	@	—
Flasks, old	37 5 @	

	Spot.	To Load.
IRON—Glengarnock ton	30 00 @—	29 @ —
Eglinton, ton	29 00 @—	29 @ —
American Soft, No. 1, ton	— @31 00	31½@ —
Oregon Pig, ton	— @26 00	— @ —
Clay Lane White	— @26 00	25 @ —
Shotts, No. 1	30 00 @30 00	— @ —
Bar Iron (base price) ₩ lb	2½@ 3	— @ —
Chrome iron ore, ₩ ton	— @10 00	— @ —
Langloan	30 00 @—	30 @ —
Thorncliffe	30 00 @—	30 @ —
Gartsherrie	30 00 @—	30 @ —

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	7 75 @ 8 00	Cardiff	9 50@10 00
Liverpool St'm	8 00 @ 8 00	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	9 00 @ 9 00	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Gilman	7 00
Scotch Splint	9 00	Seattle	7 00
Greta	9 00	Coos Bay	5 50
Westminster Brymbo	9 00	Cannel	11 00
Nanaimo	9 00	Egg, hard	18 00
Sydney	8 00	Cumberland, in sacks	19 00
Jackson	6 00	do. bulk	18 00

The Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

	Cash.	Debt.
Alta	$33,373	$.....
Alpha	20,014	.....
Andes	19,011	.....
Bodie Con	22,226	.....
Benton Con	92,394	.....
Belcher	.....	31,000
Belle Isle	.....	1,057
Best & Belcher	10,298	.....
Bulwer	16,940	.....
Bullion	6 056	.....
Challenge Con	8,019	.....
Caledonia	8,961	.....
Chollar	.....	1,904
Con. Cal. & Virginia	* 75,640	.....
Confidence	3,011	.....
Con. Imperial	.....	2,191
Con. New York	3,278	.....
Commonwealth	.....	35,203
Crown Point	3,278	.....
Del Monte	.....	24,598
Diana	.....	16,203
East Sierra Nevada	3,925	.....
Exchequer	8,269	.....
Gould & Curry	10,038	.....
Grand Prize	3,626	.....
Hale & Norcross	.....	58,878
Holmes	2,529	.....
Independence	.....	5,316
Julia	611	.....
Justice	.....	.....
Kentuck	3,971	.....
Lady Washington	.....	1,261
Locomotive	21,016	.....
North Belle Isle	1,931	.....
North Commonwealth	.....	12,307
Mexican	.....	6,413
Mono	14,375	.....
Navajo	19,355	.....
Nevada Queen	.....	13,389
Occidental	†	13,166
Ophir	24,056	3,009
Overman	19,246	.....
Peer	38	.....
Peerless	2,636	.....
Potosi	.....	27,439
Savage	.....	20,401
Scorpion	8,594	.....
Seg. Belcher & Mides	.....	20,130
Silver Hill	4,032	.....
Sierra Nevada	3,313	.....
Silver King	19,796	.....
Standard	2,805	.....
St. Louis	1,337	.....
Syndicate	8,024	.....
Union Con	6,829	.....
Utah	7,708	.....
Weldon	5,835	.....

* With shipments to arrive.
†Bullion on hand value not known.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Best & Belcher M Co	Nevada	44	25	Sept 11	Oct 16	Nov 6	L Osborn	309 Montgomery St
Central California Oil Co	California	1	50	Sept 6	Nov 1	Nov 18	F L Gorlinski	314 California St
Cadmus M Co	Nevada	—	20	Sept 19	Oct 31	Nov 25	J Craig	204 California St
Chicago M & M Co	California	2	15	Sept 13	Oct 16	Nov 4	W Grant	520 Montgomery St
Crown Point M Co	Nevada	52	50	Sept 18	Oct 21	Nov 11	J Newlands	329 Pine St
Del Norte Gravel M Co	California	2	7	Aug 24	Oct 3	Oct 26	J B Cronan	230 Montgomery St
Grand Prize M Co	Nevada	22	30	Sept 24	Oct 28	Nov 19	R R Grayson	327 Pine St
Golden Prize Con M Co	Nevada	3	25	Sept 21	Oct 26	Nov 16	C D Bennett	330 Pine St
Keyes M Co	Nevada	4	30	Aug 27	Oct 1	Oct 21	J H Sayre	328 Montgomery St
Livermore Coal M Co	California	1	59	Sept 18	Oct 19	Nov 6	G C Higgins	120 Sutter St
Lapanta Con M Co	Nevada	2	02	Oct 2	Nov 5	Dec 2	J Stadtfeldt	309 Montgomery St
Mineral King M & M Co	Arizona	3	10	Aug 22	Sept 24	Oct 21	F H Leonard	419 California St
North Belle Isle M Co	Nevada	16	20	Sept 18	Oct 22	Nov 13	J W Pew	310 Pine St
North Bonanza M Co	Nevada	9	10	Sept 17	Oct 26	Nov 14	F Holling	410 Montgomery St
Potosi M Co	Nevada	33	50	Sept 18	Oct 22	Nov 12	C E Elliott	309 Montgomery St
Platt & Gilson G M Co	California	3	4 00	Sept 11	Oct 15	Nov 4	C Herrmann	326 Kearney St
Scott Bar M & M Co	California	3	10	Sept 10	Oct 12	Oct 31	H Pink	309 Montgomery St
Silver Hill M Co	Nevada	25	20	Sept 27	Oct 31	Nov 21	D C Bates	309 Montgomery St
Sierra Nevada	Nevada	96	50	Oct 5	Nov 3	Dec 7	E L Parker	309 Montgomery St
Seg Belcher & Mides Co	Nevada	4	25	Oct 7	Nov 4	Dec 8	E A Holmes	309 Montgomery St
Southern Cal Coal & Clay Co	Cal.	2	10	30	Aug 16	Sept 16	Oct 16	W G Mugan	10 California St
True Con M Co	California	7	21	Aug 31	Oct 12	Nov 16	J C Bates	434 California St
Union Con M Co	Nevada	39	25	Oct 8	Nov 9	Dec 13	J M Buffington	303 California St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Eureka Con M Co	Nevada	H P Bush	306 Pine St	Annual	Oct 21
Mayflower Gravel M Co	California	J Morizio	328 Montgomery St	Annual	Oct 31
Silver West Con M Co	Nevada	F R Bunker	628 Montgomery St	Annual	Oct 15
Con Cal & Virginia M Co	Nevada	A W Havens	309 Montgomery St	Annual	Oct 14
Happy Val Blue Gravel & H M Co		D M Kent	330 Pine St	Annual	Oct 24
Exchequer M Co	Nevada	C E Elliot	309 Montgomery St	Annual	Oct 21
Del Monte M Co	Nevada	G D Metcalf	147 California St	Annual	Oct 14

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Champion M Co		T Wetzel	522 Montgomery St	10	Oct 15
Caledonia M Co	Nevada	A S Cheminant	328 Montgomery St	08	Aug 5
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	Sept 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	03	Aug 25
Idaho M Co	California		Grass Valley	7.50	Sept 5
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Sept 10

Mining Share Market.

The mining share market the past week continued of the same mixed and unsatisfactory character that has prevailed for the past two months. The fluctuations have been small, but it was the every little while "going-all-to-pieces" nature of the market that has demoralized outside dealers and thrown considerable quantities of stock into the hands of the pool. By reference to the weekly ranges of prices given in another column, it will be seen that the Comstocks have not fluctuated on an average of ten per cent since the 11th day of last month, yet outsiders at each shading in prices, after a small upward turn, were badly demoralized, believing that the long-talked-of break was at hand. The market acts very much as if it is oversold. It has not been helped by the levying of several assessments with more to follow soon. In outside stocks Eureka had quite an upward move under reports of higher assays and bullion shipments. Experienced operators are fearful of this stock and are confident of lower prices before long. The Tuscaroras had a small advance, but at the close appear to be on the down grade again. The Quijotoas were barely steady. The Bodies sold slightly higher, probably owing to Capt. John Kelley's presence in the city, but at the close are weaker. It is claimed that a successful deal cannot be run in these stocks until the spring months unless an ore development is made.

The news from the Comstock mines continues of the most favorable character, particularly from the Gold Hill and Middle groups. The Gold Hill mines will soon be ready for crosscutting on the various levels running down from the 500-foot to the 1300-foot levels. Official letters received yesterday indicate that the drifts have been so far advanced as to admit of several new crosscuts being started any day. In Yellow Jacket work is underway to tap the rich ore deposit from which they were driven by fire several years ago. Just before the fire the company on ore-showing declared a dividend, but on the fire breaking out, it was rescinded. The ore, if we mistake not, averages over $60 a ton. In Crown Point they have started a west crosscut from where the 400 south stope connected with the 300-foot level. This crosscut, at last advices, was in ore. Last year the stock was sent to about $10 a share on the "finding" at that time. With better connection, the ground can be better prospected and the ore taken out. With the return of Roger Pendergrast to the Comstocks it is stated that more active and interesting work will be started in the Chollar, Potosi, Bullion and Alpha. The west crosscut No. 2, on the 800-foot level of Crown Point, is out about 70 feet. This crosscut is run to cut the downward continuation of the ore found above. The new work in Confidence and Challenge has not been commenced yet. On the 1550-foot level in Con. Virginia they have run into very rich ore, yet the stock went down on the development. In Ophir another crosscut has been started. From the other North End mines very little news is obtainable—probably it is kept back for stock speculation. In Justice it is thought that a new ore development will be run into on or about the 25th of this month. From Best and Belcher and Gould and Curry nothing important is at hand. From the outside mines continued good news comes to hand from the Quijotoas, Silver King, Mt. Diablo and Tuscaroras. The Bodies report more active work on the upper levels in Bodie and Mono. On the former the old east drift on the 900-foot level is being cleaned out preparatory to resumption of explorative work on that level.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, department 10, San Francisco:

IDLEWILD G. M. Co., Oct. 7. Capital stock, $1,000,000. Directors—E. S. Chester, W. E. Straub, W. S. Chapman, H. H. Brown and E. W. Chapman.

PACIFIC FIRE ALARM Co., Oct. 8. Object, to conduct a general business in fire-alarm apparatus and supplies. Capital stock, $500,000. Directors—John I. Sabin, P. T. Morgan, J. C. Cebrian, W. G. Oliver and F. W. Eaton.

CALIFORNIA MORTGAGE LOAN Co., Oct. 9. Capital stock, $100,000. Directors—Rolla V. Watt, Robert D. McElroy, Alexander Mackay, Elijah S. Pierce, William W. Bishop, James A. Watt and Henry W. Snow.

THE pay-roll of Stanford's ranch at Vina, Butte county, amounts to $17,500 a month.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept. 18.		WEEK ENDING Sept. 25.		WEEK ENDING Oct. 4.		WEEK ENDING Oct. 11.	
Alpha	1.30	1.50	1.30	1.35	1.30	1.35	1.20	1.30
Alta	1.90	2.00	1.90	2.40	2.15	2.35	2.20	2.25
Andes	.70	.75	.70	....	.70	.75	....	....
Belcher	2.85	3.10	2.50	2.70	2.70	2.90	2.60	2.70
Best & Belcher	3.35	3.65	3.15	3.45	3.30	3.50	3.20	3.40
Bullion	.60	.65	.60	.65	.60	.65	.55	.55
Belle Isle	.15	.15	.10	....	....	....	....	....
Bodie Con	.75	.85	.60	.85	.70	.80	.70	.85
Benton	....	....	....	....	....	....	....	....
Bulwer	.30	.30	.30	....	.30	.30	.30	.30
Commonwealth	3.20	3.25	....	....	3.10	....	3.05	3.30
Con. Va. & Cal	6⅝	7⅜	6¼	6⅝	6⅝	6⅞	6⅝	6⅝
Challenge	2.80	3.50	2.70	2.95	2.70	2.90	2.75	2.80
Chollar	1.85	2.30	1.90	2.00	1.85	1.90	1.65	1.75
Confidence	....	....	6.25	....	6½	7	6½	6⅝
Con. Imperial	.45	.50	.40	.45	.40	.45	.40	.45
Caledonia	....	....	.25	.25	.25	....	.20	....
Crown Point	2.74	3.30	2.50	2.80	2.50	2.85	2.25	2.55
Crocker	.45	.60	.45	.54	.50	.60	.50	.55
Dudley	....	....	....	....	....	....	....	....
Eureka Con	2.25	2.25	2.40	3.50	3.00	3.25	3.20	5.50
Exchequer	.60	.70	.60	....	.50	.60	.50	.55
Grand Prize	.75	.80	.60	....	.50	....	.50	.55
Gould & Curry	1.95	2.30	1.90	2.05	1.95	2.05	1.90	2.05
Hale & Norcross	3.00	3.45	3.15	3.20	3.00	3.30	2.75	3.05
Julia	....	....	.25	....	....	....	....	....
Justice	1.70	1.85	1.55	1.90	1.65	1.70	1.55	1.70
Kentuck	1.10	1.25	1.10	1.30	1.25	1.30	1.15	....
Lady Wash	.40	.45	.40	....	....	....	.40	....
Locomotive	....	....	....	....	.05	....	....	....
Mono	.75	.80	.75	.80	.70	.80	.75	.80
Mexican	3.70	4.45	3.60	3.85	3.75	4.20	3.60	4.10
Navajo	.35	.40	.30	....	.30	.35	.35	.40
North Belle Isle	.80	.90	.75	.85	.70	.75	.80	.80
Nev. Queen	.80	.85	.80	....	.60	.65	.85	.85
Occidental	1.70	1.75	1.40	1.50	1.45	1.50	1.40	1.45
Ophir	4.45	5⅛	4.40	4.75	4.30	4.95	4.50	4.80
Overman	1.15	1.30	1.10	1.30	1.10	1.30	1.05	1.15
Potosi	1.40	1.70	1.25	1.40	1.30	1.45	1.25	1.35
Peerless	.35	.35	....	....	.30	.40	.30	.35
Peer	.10	.15	....	....	.10	.10	.10	.20
Savage	2.20	2.60	2.15	2.25	2.00	2.30	1.75	2.05
S. B. & M	1.80	1.95	1.55	1.75	1.65	1.85	1.35	1.60
Sierra Nevada	2.60	3.05	2.60	2.75	2.60	2.85	2.20	2.60
Silver Hill	.45	.45	40	....	.30	.35	.25	....
Silver King	....	....	....	....	....	....	....	....
Scorpion	.20	.30	.30	....	.20	.30	.20	....
St. Louis	.35	.35	....	....	....	....	....	....
Union Con	2.90	3.45	2.95	3.20	3.00	3.30	2.95	3.10
Utah	1.00	1.20	.95	1.05	.95	1.05	.90	.95
Weldon	.20	....	....	....	....	....	....	....
Yellow Jacket	3.20	3.45	3.00	3.20	3.10	3.40	3.05	3.25
....	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY, Oct. 10, 9:30 A. M.:

200	Grand Prize	200	70c
125	Gould & Curry	100	1.90
100	Alta	100	Hale & Nor
100	Alpha	50	Justice
100	Belcher	50	Mexican
100	Bodie	100	N. Commonwealth
250	Bullion	20	Ophir
100	Caledonia, buyer	100	Peerless
100	Commonwealth	100	Potosi
800	Crown Point	100	Savage
00	Con. Imperial	150	S. B. & M
180	Con Va & Cal	300	Sierra Nevada
30	Del Monte	100	Utah
200	Eureka Con	200	Union
350	Exchequer	200	W Comstock

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Cons. California and Virginia, Oct. 5, $59,582; 6, $111,111; Occidental Con., 5, $7000; Eureka Con., 8, $25,000; Hanauer, 2, $2250; Justice, 5, $4614; Utah, 5, $6072; Hanauer, 4, $3100; Crescent, 4, $4000; Hanauer, 5, $2550.

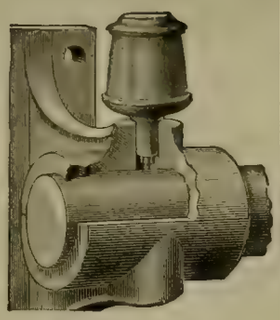
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As Dewey & Co. have been in the patent solicitating business on this Coast now for so many years, the firm's name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific Coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this Coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That this is understood and appreciated, is evidenced by the number of patents issued through their SCIENTIFIC PRESS Patent Agency (S. F.) from week to week and year to year.

BLOCK 13 in East Oakland, Alameda county, has been bought by F. M. Smith and others, who will establish borax works there at an early day. The buildings will occupy almost the entire space, and the capacity of the works will be about 100 tons a week.

ALBANY
Lubricating Compound and Cups.

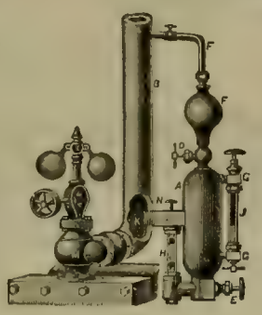




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1889.
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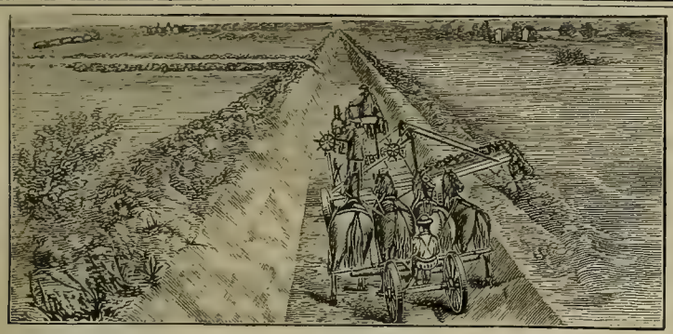


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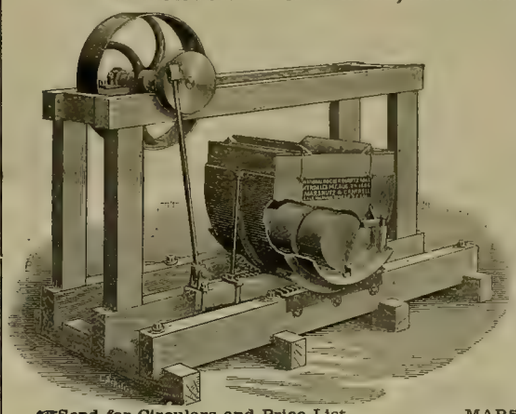


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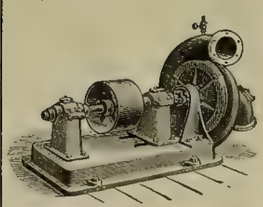


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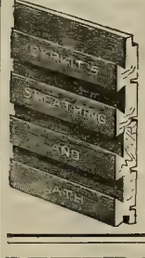
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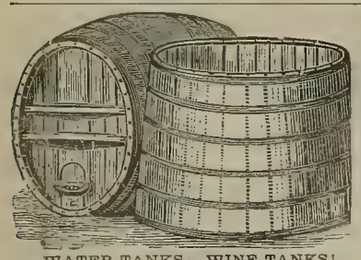
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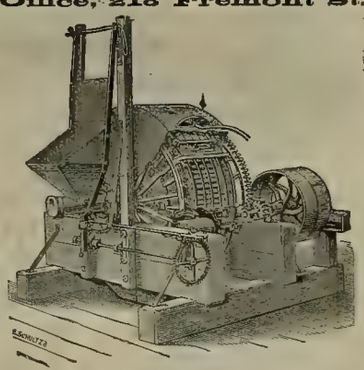
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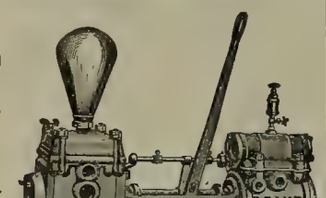
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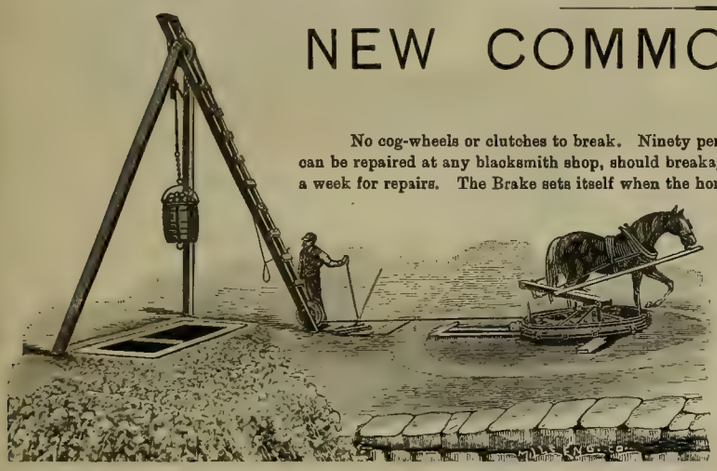
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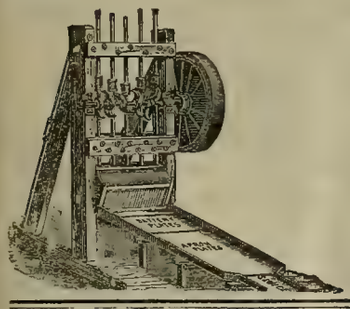
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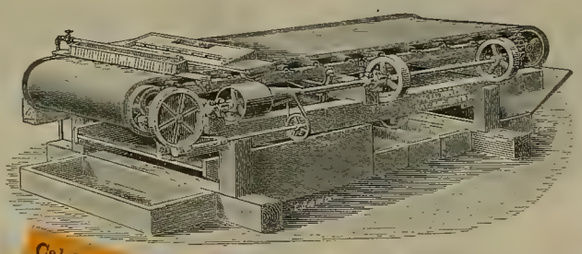
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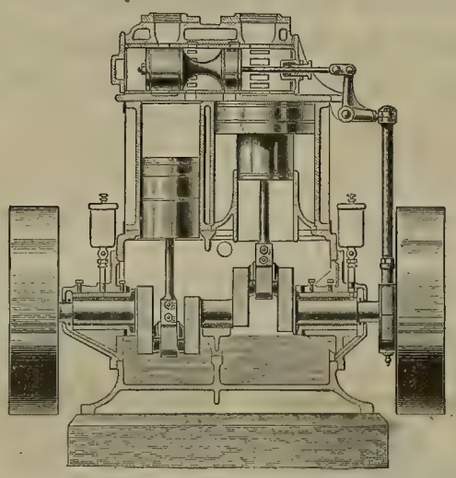
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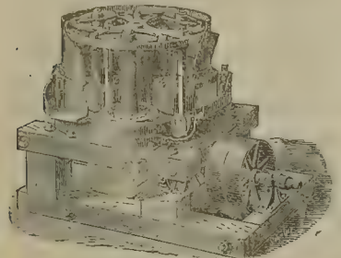
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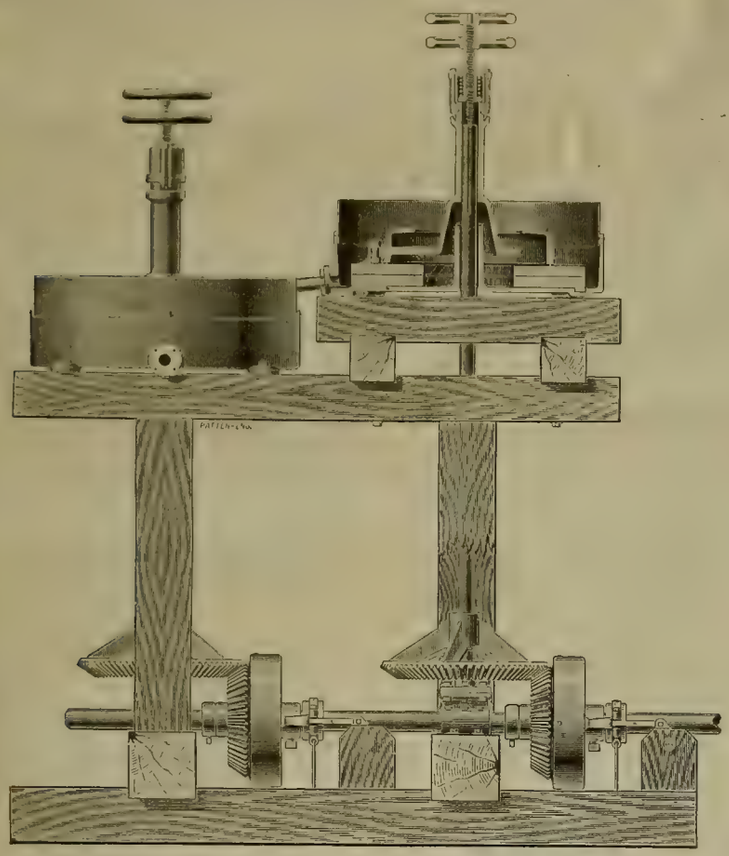
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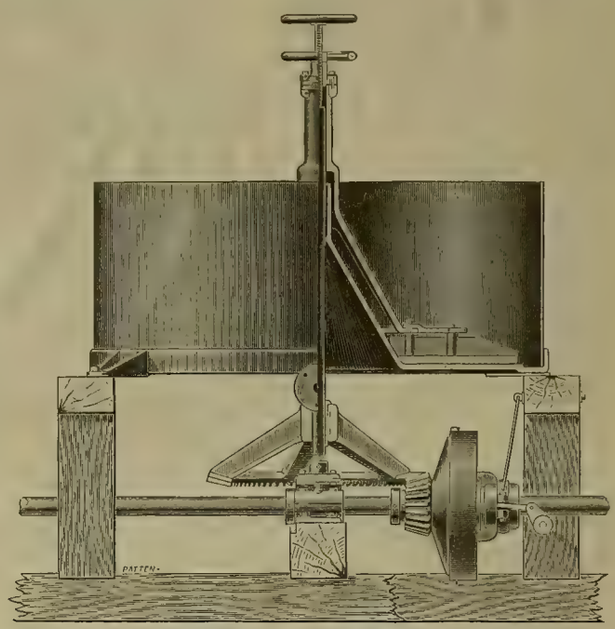
MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LIX Number 16. DEWEY & CO., PUBLISHERS. SAN FRANCISCO, SATURDAY, OCTOBER 19, 1889. Three Dollars per Annum. Single Copies, 10 Cts.



SPECIAL GRINDING PANS FOR CONTINUOUS PROCESS.



STANDARD SETTLER.

Standard Pans and Settlers.

Mr. M. P. Boss, whose continuous process for working ores has been so successful, is also the inventor of special pans and settlers to be used in continuous-process mills, as shown in the engravings herewith. The special grinding pans grind all the pulp after coming from the battery, thus relieving the amalgamating pans of this duty. These pans are made four feet in diameter, and have solid ring shoes and dies slotted for a short distance from their inner edges to better admit the pulp between them. The pulp is introduced at the center of the pan; and, as a joint is made with a rubber gasket between the shoe ring and muller-plate, it is all obliged to pass between the shoe and die before being discharged. The cut shows one pan placed below the other, receiving and regrinding the pulp as it comes from the first, and is the arrangement made for two grinding pans receiving the pulp from ten stamps.

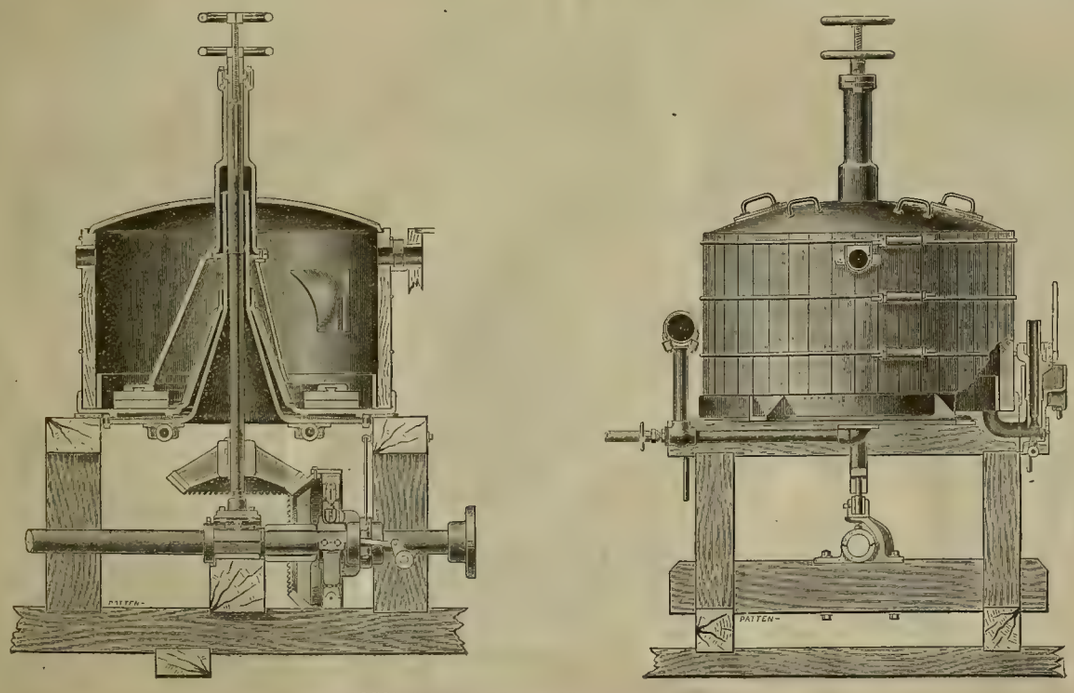
The Standard amalgamating pan is also shown in the cuts. It is made heavier in proportion than other pans and provided with a wearing ring inside of staves, and also with a sleeve for protecting cone.

The steam bottom extends up into and around the cone, and at its top carries the bearing for the pan spindle. By this arrangement an increased heating surface is obtained. A rust-joint is made between the cone on the steam bottom and the main pan cone, while the steam bottom proper is bolted to the pan bottom in the usual manner. Exhaust steam is used for heating. The steam is admitted on one side of the bottom and exhausted on the other, a valve being provided for regulating and shutting off. The pan spindle step is carried on a bracket on the main driving shaft box, and permits the removal of the shaft without disturbing the spindle. The friction ring through which the pan is driven is bolted to gear, so that it can at any time be replaced independently of other parts.

One of the cuts of the pan shows in section the quicksilver bowl with pan siphon in position for draining the pan of quicksilver and amalgam when in need of repairs. These pans are four feet two inches inside diameter and weigh 8500 pounds.

The Standard settler shown in the cuts is also designed for use in continuous mills. The muller arms and driver are cast in one piece, to which the muller-plate is bolted. The friction

(Continued on page 304.)



BOSS' STANDARD AMALGAMATING PANS.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

The Mines of Placer County.

EDITORS PRESS:—This section has been written up for the PRESS lately, and in consequence it is not necessary to go into an extended description. The success attending the working of the Hathaway has infused new life into the district. Now that it is proven beyond a doubt that the ores of the section are not only rich, but that the contents can be saved, it will be but a question of time, and a short time at that, until Ophir will see greater activity in her quartz-mining interest than at any previous time. The Hathaway had been worked for the gold contents of the ore. The antimonial silver ore was not recognized, but thought to be galena. Mr. D. P. Price and his able millman, Mr. H. C. Haupt, took hold of the property for the owners, Messrs. Valentine Bros., and soon had the ores under control. The Frue, Woodberry and Victor concentrators were set aside and the Garnier put in place. This concentrator is a canvas-belt machine, with a motion similar to hand-panning. The machines have the merit of being low-priced as well as successful. At first some difficulty was experienced with the concentrators, but Mr. Haupt has overcome that, and to-day the mine and mill are a decided success, the silver value of the rock equaling that of the gold. As depth is attained, the rock is more heavily mineralized. Some of the richest of the ore is sacked and shipped to Argo, Colorado, for treatment. Next in value to the high grade of the ore is the fact that the pay is continuous throughout the entire length of the workings on the vein and growing richer. The shaft is down 250 feet, with drifts run 1005 feet, showing a vein of an average width of three feet in granite walls. Unlike many mines, this property has opened up and in reserve sufficient ore to keep the 20-stamp mill running steadily for a year. Developments are kept ahead all the time, and in consequence the ore reserves are constantly being added to. It is hardly necessary to add that Messrs. Price and Haupt (formerly of the "Nevill's," Angels) are the right men in the right place.

Roseville.

At Trap Ravine, Blair & Morgan sunk through the hardpan and discovered the old channel underneath. This pays, as far as prospected, 5c. to the pan. A ditch four miles in length has brought in water, and the property looks promising. The area is about one-fourth of a mile wide by one-half mile long.

Penryn.

The 10-stamp mill of the Phœnix is running steadily. Surrounded on all sides by orchards, the Phœnix is apt to be passed as idle, but such is not the case. The shaft is now down 320 feet on a ledge averaging 2½ feet, though 20 feet in width in places. Drifts have been run 300 feet, proving the average value of the rock to be $7 a ton in free gold.

The Julian is closed and its surface covered with golden fruits of every description. It is a question whether the old Julian mine in its best days was ever as profitable as the Julian fruit ranch is to-day.

Kendall Cement Mines.

These are located six miles northwest of Newcastle on Badger ravine. The ores, or cement, is crushed in the mills of the president's invention—the Kendall. Just how rich the cement is, I was not able to ascertain. The survey of the operations would lead one to suppose that it was not only "a good thing," but "a big one."

At Colfax, the Rising Sun mine is closed on account of litigation. The mine has produced over $2,000,000.

Forest Hill.

All along the ridge mining is quiet, with the exception of a few big mines. The Grey Eagle mill is closed, while a drain tunnel 2700 feet long is being driven to cut the vein 417 feet deep.

The Mayflower

Is the mine of the section. The old surface gravel was worked off with a hydraulic, realizing a vast amount of gold. When the mine was closed down by the debris decision, a shaft was put down 500 feet and the blue gravel found under the basalt. To work this a tunnel 5200 feet long was driven. This cut the channel on an average eight feet below its bed. From this gangway upraises are made to the gravel. An average of eight feet of the gravel next the bedrock is worked. The drifts have been run north 888 feet and south 975 feet, the channel running nearly north and south. In this blue gravel the value is $2 to $20 a car. In working the blue-gravel cement a cross channel of quartz gravel was struck running east and west. This is free from cement and the three feet worked very profitably. This quartz gravel lead is quite an addition to the wealth of the section. Its presence was not known until it was drifted into. As it is entirely blind, it does not show on the surface. Everything about the Mayflower shows good management. The 20-stamp mill crushes the cement freed from the boulders. Immediately below the batteries are grinding-tables or polishers which polish the gold and catch all amalgam escaping from the batteries. The gold is coarse and shaped like a flax or pumpkin-seed. A large air-compressor furnishes power for the drills and air for the ventilation of the mine. One hundred and thirty-five men are employed at this mine. The product of the mine since December, 1888, has been $267,000.

Dardanelles.

This valuable property is closed for the present. From the upper channel $3,500,000 was taken out. A shaft costing $250,000 was then put down and the blue-gravel lead of the Mayflower struck. All this property wants is a bedrock tunnel.

The Mountain.

On this mine the tunnel was run too high, and the mine was closed down until another tunnel can be driven. This is the condition of the other locations on the lead, all wanting bedrock tunnels. Once they are opened up, Forest Hill will be a more prosperous camp than in her palmy hydraulic days. The gravel is now known to be there and to be rich. Time will see it worked and that extensively. I did not go beyond Forest Hill, so could not give anything but hearsay knowledge of it, which is not desirable.

E. H. SCHAEFFLE.

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Mercurial Minerals and Their Associates.

[Written for the MINING AND SCIENTIFIC PRESS]

Minerals containing mercury are but few; nor do they occur in many localities.

Certain unusual conditions must exist before a metal having the great specific gravity of mercury can be transferred from subterranean depositories to the earth's surface and placed within reach of man.

The following list embraces practically all the species and combinations known. For convenience they have been arranged alphabetically a numbered.

1. Amalgam.

This rare mineral is a mechanical alloy or amalgam of mercury and silver. Its color and streak are silver white. It is brittle, like very hard artificial silver amalgam, and like it, cuts with a grating sound. It is wholly soluble in nitric acid, and if heated in a closed glass tube mercury sublimes in the cold part, and may by simple inspection be recognized as such. If rubbed on a clean surface of metallic copper it imparts to it a metallic coating of silver whiteness.

Hardness, 3 3–5; specific gravity, 10.5; contains from 64 to 73 per cent of mercury.

This mineral has been found sparingly in Chili, Spain, Sweden, Hungary, and in unusually fine crystals in the Palatinate where veins of silver and mercury intersect.

The name amalgam is derived from a Greek word meaning a poultice, or soft substance, which it was thought to resemble. Arquerite, another form of the same mineral, was first found at Arqueros, near Coquimbo, in Chili, whence the name. It has recently been found in the bed of Vitelle creek, British Columbia, with native copper, both in the form of flattened rolled nuggets from the smallest particles to pieces an inch or two in length.

Artificial crystals of amalgam form not infrequently during the amalgamation of silver ores. The following analysis of a sample is given in the MINING AND SCIENTIFIC PRESS, Vol. 45, Folio 360:

Mercury	75.04
Silver	24.18
Gold	.77
Total	99.99

2. Barcenite.

Is a mineral of doubtful composition and probably a mechanical mixture, containing besides mercury, antimony, sulphur lime, oxygen and water, mercury about 21 per cent.

Hardness, 5-5; specific gravity, 5 343; color nearly black, streak ash-gray, luster, dull, earthy and opaque. It was found at Huitzaco, State of Guerrero, Mexico, was exhibited at the Centennial Exposition at Philadelphia in 1876, and described in the American Journal of Science and Arts, Vol. 16, 1878, Fol. 306.

The name was derived from Sr. M. Barcena, a Mexican mineralogist. It somewhat resembles Livingstonite, found at the same locality.

3. Bordosite.

This mineral seems to be a double chloride of silver and mercury as follows:

Chloride of silver	31.23
Chloride of mercury	45.53
Oxide of mercury	22.70
Total	99.46

It is considered by Bertrand, who described it in 1874, to be a mechanical mixture. He named the oxide, which he considered foreign, *Hydrargyrite*, and the chlorides, *Bordosite*, which combine as follows:

Chloride of silver	40.69
Chloride of mercury	59.31
Total	100.00

Dana considers both species very uncertain. The mineral, which is of rare occurrence, was named from the locality, Los Bordos in Chili.

4. Calomel,

Called also *horn-quicksilver*, is rather a rare mineral. It is a chloride of mercury, containing when pure 84.9 per cent of mercury; occurs in crusts, granular concretions, and crystals; sectile; hardness, 1.5; specific gravity, 6.48; color, yellow and gray to brown. It is wholly volatile at a red heat, insoluble in water but decomposed by acids. It is found only in mines of quicksilver associated with cinnabar and other minerals. In the Palatinate it is met with in fine crystals. It occurs also in the mines of Almaden and Idria, and in Bohemia; not known in California, but probably exists, and would be found if sought for.

"Calomelus," from which (according to Perrira) the name calomel is derived, is from two Greek words, *good* and *black*, and was used in the first part of the 17th century by Sir Theodore Torquette De Mayenne, because he had a favorite negro servant who prepared it artificially with skill, or because it was *good* for *black* bile. According to Dana the meaning was "beautiful," and "honey," "*Mercurus Dulcis.*"

5. Cinnabar.

By far the most abundant mercurial mineral known is cinnabar, which exists in two forms, the red and the black. The latter, which has the same composition but differs in appearance from cinnabar, has been named Metacinnabarite, and it bears the same relation to the former that ethiop's mineral does to vermilion.

The name cinnabaris is of very early origin. Among the ancient Romans it had several meanings, and the terms Dragon's blood, cinnabar and minium were interchangeable. The word minium is now applied to native red oxide of lead.

Pliny, B. XXXIII, Chap. 38, mentions this confusion of terms, and writes of ships painted with rubrica (red ocher) in the days of the Trojan war. "The Greeks call this red substance Miltos, and to Minium give the name Cinnabaris. Hence the error caused by the two meanings of the same word, this being properly the name given to the thick matter which issues from the dragon when crushed by the weight of the dying elephant mixed with the blood of either animal."

In B. VIII, Chap. 12, he describes the fight between the elephant and the dragon. This dragon's blood (Sanguis draconis) was a gum which still retains the name, then as now brought from the East Indies. It is used at the present time in coloring varnishes, but not in medicine. Pliny calls cinnabar, minium, B. XXXIII, C. 37.

The ancient name for cinnabar, Minium, by evolution became the modern word mine. The Italian term mineria was intermediate.

When prepared artificially by chemical union of the elements, not as described by Theophrastus, it is called vermilion, which is fully described elsewhere. The word is quite a recent one, being taken from the French "vermeil," from "vermiculum," a term applied in the Middle Ages to Kermes, the Arabic name for an insect from which a red dye is obtained. The literal translation of Kermes is "little worm;" hence the name "vermiculum" and "vermilion."

The following names, ancient, modern and alchemistic, have been given to Cinnabar:

Alzemafor, Ammion, Ammo Gabriel, Anthrax, Aremaros, Azemaros, Bergzinober, Cinnabar, Cinnabaris, Coral Ore, Cynabar, Graecorum, Minium, Minium nativum, Mercur blende, Schweifelquecksilber, Vermilion.

It has been shown that cinnabar was first known in history at Ephesus in Asia Minor. It was afterward discovered in Spain, at what is now Almaden. After the latter locality was known, the mines at the former were still worked, but the Romans monopolized the trade and consumed the entire product. Vitruvius wrote as follows: "The shops established in Ephesus for the manufacture of cinnabar have been removed to Rome, that mineral having been found in Spain, from which country it is carried in the rock of the city, from which the workmen prepare the color."

The above quotation refers to the locality known in the days of Theophrastus. In Pliny's time it was brought principally from Almaden in Spain. He has informed us in his works that cinnabar was found in Carmania in Ethiopia, but none from these localities was brought to Rome; nearly all came from Spain, and most of this from Sisapo (Almaden). The importation being part of the revenue, the mines were locked and the keys kept by the Governor of the Province, and could only be opened by order of the Roman Emperor, to be closed again when the prescribed quantity was taken out.

"There is nothing guarded with a more constant circumspection, for it is not allowable to reduce or refine the ore on the spot, it being brought to Rome in a crude state under seal, to the amount of about 2000 pounds per annum. At Rome the process of washing it is performed, and in the sale of it the price is regulated by statute, it not being allowed to exceed 70 sesterces per pound" (about $2.80).

"The ancients used to paint with (dragon's blood) these pictures of one color," etc. "They painted also with minium of Ephesus (cinnabar), but the pictures being harsh and hard to keep, rubrica (red ocher) was substituted."

What was written by Theophrastus concerning cinnabar has already been quoted.

Herodotus, a still more ancient writer, mentions the use of vermilion at least twice, but whether the word vermilion in the English translation was really cinnabar, is a question of considerable doubt. In the book Melpomene, Chap. 191, may be found the following: "They (the Maxyes) let the hair grow on the right side of the head, and shave the left, and bedaub the body with vermilion." In the same book, Chap. 194: "All these paint themselves with vermilion and eat monkeys which abound in their mountains."

In more modern times, vermilion was imported into Europe and China. Cramer, "Art of Assaying Metals, 1764," writes: "There is in London plenty of the purest cinnabar, imported from China by the East India Company."

Mineralogical Description of Cinnabar.

Color and streak, scarlet red. Specific gravity, 8.99; hardness, 2.5; wholly volatile at a high degree of heat; gives B. B. in a closed glass tube, a sublimate of nearly black color and an odor of sulphur. When heated in the same manner but with the addition of dry carbonate of soda, metallic mercury sublimes and condenses in globules in the cold portion of the tube; when pure, cinnabar contains 86.2 per cent of metallic mercury. It is nearly always crystallized; a mass which appears amorphous, when examined microscopically, is seen to be an aggregation of crystals.

There is a specimen in the State Museum, No. 1728, from the Almaden mine, Santa Clara county, in crystals.

Magnificent groups of crystals of cinnabar and metacinnabarite were quite common in the Redington mine in Lake county; they were shoveled into the furnaces like the most ignoble ores.

In Mariposa county, near Coulterville, cinnabar was found in the wall-rocks of a gold mine; it was in small but distinct transparent crystals.

At the Paris Exposition of 1878, splendid crystals perfectly terminated were shown, from the Almaden mine of Spain; also a mass of nearly pure cinnabar weighing several hundred pounds. At the Pacific Coast Mineral Exposition of 1883, on the occasion of the Triennial Conclave of the Knights Templar of the United States, held in San Francisco, Mr. J. B. Randol exhibited a mass of cinnabar from the New Almaden quicksilver mine, which weighed 290 pounds.

Properties of Cinnabar.

Cinnabar is far from being a permanent mineral; on the contrary, it is continually undergoing change. When placed in a mineral cabinet and protected with the greatest care, signs of decomposition soon become manifest; a peculiar odor is the first indication; the sulphur begins to oxidize to sulphuric acid, which stains the woodwork of the cabinet and changes the color of blue paper to red if any chances to be near; hydrosulphuric acid is generated, which blackens silver and other metals; the new minerals deliquesce, which accelerates the decomposition, and the finest crystallized specimens too frequently disintegrate.

In the quicksilver mines of California similar changes are continually taking place, which may be best observed at Sulphur Creek, Colusa county, and at the Sulphur Bank, in Lake county.

The ancients were well aware of the poisonous qualities of cinnabar, for Pliny informs us that "persons employed in the rooms where cinnabar is prepared, protect the face with masks of loose bladder-skin to avoid inhaling the dust, which is highly poisonous," and cites an instance of a physician who administered mineral vermilion (minium) instead of Indian cinnabar (dragon's blood), owing to the confusion of terms mentioned elsewhere.

The artificial preparation (vermilion) is a brilliant scarlet substance, heavy and finely pulverized, much used as a pigment; when pure, it is wholly volatilized at a red heat. As metallic mercury is generally reduced from cinnabar, so is vermilion prepared from metallic mercury, the process being reversed.

Varieties of Cinnabar.

The varieties of cinnabar and other mercurial minerals were not known or studied until quite recent times. Cramer, after describing quicksilver, thus discourses of cinnabar: "There is but one single ore of mercury known, called cinnabar, of which you will find very good specimens in every druggist or apothecaries' shop under the name of native cinnabar. It is of the finest scarlet color, and when broke appears striated with small parallel furrows. Besides, it is very heavy and soft and consists of mere sulphur and mercury; in such manner, however, that the quantity of the mercury is commonly about six times greater than that of the sulphur, and that the beauty of the color of the cinnabar depends on the abundance of it, as the regeneration and chemical *analysis* of cinnabar shows. Hence the reason is likewise evident why this ore is so very volatile in comparison with other ores.

"Mercury and its ore cinnabar is more seldom found than any metal, so that, according to the calculations of Dr. Hoffman, there is fifty times more gold got every year out of the mines than mercury or its ore. This indeed is very true, but it seems to be no less certain mercury and its ore offer more frequently than we think, but are not known to us. This will appear probable to any that consider that metallurgists try the minerals unknown to them in a strong open fire, only making with them scorifications, copellations and various melting preparations, and neglect, or perhaps are ignorant of those operations that are made in close vessels, because they hardly ever think of mercury except when quicksilver itself or the scarlet color of its ore offers it to the eyes. Besides, the color, weight and figure of cinnabar (which is nevertheless most easily distinguished from other minerals when pure) are altered to such a degree by other minerals mixt with them that

can never be detected by the mere outward view and without making an experiment."

"Coroll: You will indeed find in the works of chemists several experiments mentioned by which they say that mercury has been fetched out of minerals; but all these experiments are here of little service to us. For (1) these minerals are not exactly described, so that they could not be distinguished if they should offer us; and if they have been called by a name, the same is also common to many other things or the signification of it known to none but the author himself. (2) The particulars necessary in the relating of experiments have been almost entirely omitted, * * * and no other mineral, especially sulphur, can be in the case, for the latter may be mixt with mercury by a bare trituration or even by heat, and with it makes a black powder called the *Ethiop's Mineral*, which being agitated by a strong fire in a high, narrow, close glass or earthen vessel, is sublimed, produces that kind of cinnabar which is called *Factitious Cinnabar* because it is like that native ore of mercury which goes by this name."

D'Argenville; l'Oryctologie, 1755, writes of natural and artificial cinnabar. The former is described as being heavy, globular, striated internally, red externally and crystallized.

Cronstedt (System of Mineralogy 1760) thus describes the varieties of cinnabar:

"*Cinnabaris nativa* of a red color and Sp. Gr. 7 5.

"Loose or friable cinnabar, *Cinnabaris Friabilis*, which looks like red ochre.

"Indurated *Minera Mercurii Indurata*, solid cinnabar, is of a deep red color which occurs 1, steel grained; 2, radiated; 3, composed of small cubes or scaly; 4, crystallized."

The following is the result of a microscopical study of a number of specimens of cinnabar selected somewhat at random, from the cabinet of the writer:

A—A mass of botryoidal pyrites from Lake county, on which may be seen a thin incrustation of cinnabar. With the exception of a few minute quartz crystals, the minerals are amorphous.

B—Cinnabar in chalcedonic quartz, Manhattan mine, Lake county. This is a piece of chalcedony evidently deposited by water in concentric coats or shells. It is rose-colored, from cinnabar dimly seen through the translucent quartz. Although an interesting specimen, it is not a beautiful one.

C—A specimen of high-grade ore from the Bradford mine, Lake county (technically called "liver ore"). Color, indistinct red, almost liver-colored, covered with shining points. Streak scarlet. Hardness of the mass, 4, but the crushed mineral scratches glass. Specific gravity, 3 25. Without optical aid, seems a mixture of several minerals, and the specimen so examined was provisionally labeled "Cinnabar and Metacinnabarite." But on placing it under the microscope it was found that no metacinnabarite or similar mineral was present, and that the liver color was illusory. But a still more interesting association of minerals was revealed. The dark-colored mineral was recognized as chalcedonic quartz, and its solfataric origin could scarce be doubted, for it had evidently been deposited by the action of hot water. The bright points were scarlet cinnabar, imbedded in the gray, almost blue, chalcedony. With these were occasional crystals of pyrite and stibnite, neither, however, in any considerable quantity. Some of the chalcedony was colored rosy-red by the cinnabar, not imbedded nor directly in view, but so placed that the reflected light was warmly tinged.

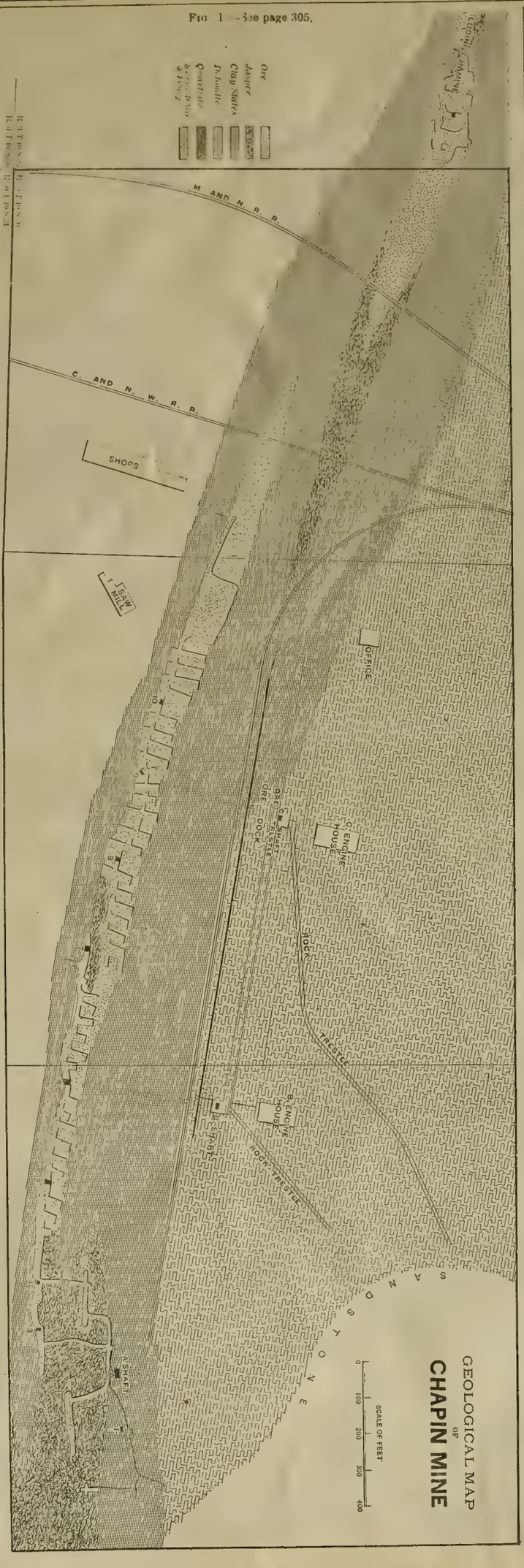
Other forms resembled raspberries, and, magnified, seemed the same in size and color. Crystals were the exception, most of the minerals being in the amorphous state; the chalcedony assumed several forms, hyaline, cavernous, concretionary, mammillary, botryoidal and granular. The Phœnix mine, in Napa county, produces specimens which are, in reality, what these appeared under the microscope.

D—This is a mass of chalcedony. As a hand specimen it somewhat resembles a pile of raspberries; so seen it is not especially interesting, but under the microscope it becomes an aggregation of semi-crystallized quartz, coated with powdery amorphous cinnabar. There are some interesting features in connection with the deposition of the cinnabar, but hardly worthy special description.

E—A specimen showing blotches of red on a grayish field. The microscope showed it to be a mass of exquisite crystals of cinnabar and beautiful doubly terminated but minute crystals of quartz. One fissure was crossed from side to side by fibers and films of a mineral resembling cobwebs. As a whole, this formation resembled a cartilage, but was crystalline. Nothing could exceed the beauty and perfection of the quartz crystals.

F—The Oat Hill mines in Napa county produce a peculiar association of minerals differing in some particulars from any others in the State. A hand specimen seems a piece of pink, almost gray, sandstone which may be crumbled between the fingers to a rather fine powder. When ground in a mortar, a brilliant powder results. When crushed by the fingers it becomes under the microscope a collection of crystals of pure, semi-transparent cinnabar associated with a clear white amorphous powder which appears to be silica; it has an almost vitreous luster. Most of the cinnabar crystals are free, but some are imbedded in the white mineral while others are attached to it. Most of the crystals are broken; beautiful faces and angles

Fig. 1.—See page 305.



may be seen and admired. The smallest fragments measured with the micrometer were found to be .002 inch, and the largest, .0215; average, .005.

G—Specimen from the Redington mine, Lake county. This was a mass of pyrites and quartz splendidly crystallized, on which had been deposited a thin coating of amorphous cinnabar.

H—Specimen from Steamboat Springs, near Virginia City, Nevada. This is solfataric matter stained faintly scarlet by amorphous cinnabar. When magnified 100 diameters, it is still amorphous and uninteresting. Some parts are nearly white, showing only a blush of color, but distinctly stained by cinnabar. In general appearance it resembles the Utah mineral. R.

I—A specimen from the Redington mine, Lake county. The general appearance of this specimen is glimmering red points in a grayish gangue. Under the microscope it is seen to be chalcedonic, cavernous, milky quartz, with metacinnabarite and clusters of the most perfect and beautiful crystals of cinnabar; some needle-shaped, others curved, all more or less perfectly terminated. A broken crystal revealed the cause of the varying shades of color that the cinnabar assumed, at first quite puzzling. This tell-tale crystal was thinly plated on one side with nearly transparent quartz, on the other with milky chalcedony. None of the quartz was crystallized, but assumed interesting botryoidal and stalactitic forms. Some of the cinnabar crystals had been broken and faultily recemented.

J—Specimen from the Redington mine. This was an aggregation of rather large individual crystals of cinnabar superimposed on a mass of cockscomb pyrites. The color of the crystals was intense crimson with steely tarnish caused by a thin coating of other minerals; they were not transparent, but translucent. Where accidentally broken, the fragments were scarlet.

K—This was a specimen of breccia cemented by cinnabar, also from the Redington mine. The cinnabar seemed to have been sublimed through a loose mass of angular broken fragments of chalcedonic and solfataric rocks; crystals were rare, a few of pyrite and gypsum, and drusy crystals of quartz were seen under the microscope. A similar rock has been found in Douglas Co., Oregon.

L—This was a specimen of pyrolusite from Sulphur Creek, Colusa county, on which was a thin scale-like deposit of cinnabar. The manganese mineral had the general appearance of black lava and was in part indistinctly fibrous, the fibers being in wavy lines. Other surfaces were mammillary and coated ice-like, with chalcedony or hyaline quartz. The cinnabar coating was intensely scarlet and perfectly amorphous, even when highly magnified.

M—This was lately received from Mr. J. H. Smith of Little Stony, Colusa county. There were several specimens, the extreme beauty of which could not be known without the aid of the microscope. One was a fragment of fine-grained sedimentary rock, upon which had recently been deposited a thin stratum of crystallized minerals, the most distinctly seen of which was gold. When casually examined as a hand specimen without optical aid, the gold seems to be in mossy patches without special character; the other minerals, not all of which were visible, seemed hardly worth critical examination. But on being placed under the microscope the drusy gold became a mass of crystals, the beauty of which could not fail to excite admiration. Not content with this exquisite work, Nature has dotted the gold with minute but perfectly terminated crystals of other minerals. This extraordinary association shows that solfataric agencies are still actively at work at the locality.

The following species could be clearly identified: Bitumen (idrialite or aragotite). Cinnabar. Calcite (nail head spar). Electrum. Gold. Metacinnabarite. Pyrite. Quartz. Stibnite. The bitumen was in cavities and fissures and was amorphous; the cinnabar was seen as an incrustation and was crypto-crystalline and dull in color; the electrum was in minute amorphous particles attached to the gold which was crystallized in arborescent and dendritic forms but lusterless; the pyrite was in two forms, the cockscomb variety and in cubes; the metacinnabarite was amorphous; the quartz, amorphous hyaline and chalcedonic; all varieties were stained with imbedded cinnabar; the stibnite was in minute needles, brilliant and with highly metallic luster.

The gold was exquisitely crystallized, not with brilliant planes like crystallized gold found elsewhere in the State, but a mossy, dendritic, plumose, arborescent matte. Globular and radiated crystals of cinnabar and an occasional perfect double terminated crystal of transparent quartz could be seen nestling in the golden fern leaves. At Sulphur Creek, near the locality of these very interesting specimens, there is a gas-jet which has been burning for years. On the sides of the fissure from which the gas escapes, sulphur and cinnabar have formed. Mr. George Senn informed the writer that out of curiosity he once scraped these accumulations away, and that returning in two months they had been renewed. With similar experience it is no wonder the alchemists were led to believe that Nature was continually employed in creating metals and tried to imitate her.

N—Two varieties of cinnabar from the New Almaden mine, Santa Clara county—one dark and the other a light-colored variety.

(*To be Continued.*)

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Calaveras.

Iron Mine.—The Angels *Record* says: While on a trip through the county recently, we visited the iron mine of Mr. Alexander Thompson, about four miles north of Murphys. The developments are sufficient to show a heavy and permanent body of ore. It has been found that this ore is of a good quality or grade, and is readily converted into pig iron. Herein we are compelled to regret the fact of there being no railroad traversing that section, as quantities of iron ore could be shipped, not only from that mine, but others along the route. Calaveras county has many iron mines, which if a railroad were here, could and would be profitably operated, thus contributing to the benefit of this county, and generally to the State's prosperity. And not only would the iron industry be established, but large quantities of gypsum would be shipped, a vast body of the latter named, being in close proximity to the above mine.

Mokelumne Items.—The Calaveras *Chronicle* says: While but few mining operations are at present going on, the outlook is good for something stirring in the course of two or three months. Just at this season is always the dullest time every year, and more especially this, on account of the unusually long dry season through which we have passed. Several enterprises in the immediate vicinity are now passing through the preliminaries and they promise something substantial in their consummation. We have already made mention of several of those which have reached an advanced stage of completion, which means, of course, that they are "a go." In these cases the meteorological conditions, it must be allowed, will set the time for the commencement of active operations. At Sandy Bar, on the Mokelumne river about two miles from this place, there is promise of activity in the near future, from the fact that there are several valuable quartz locations centering there. The Sandy Bar Mining Company, with Col. W. T. Robinson as superintendent, is making preparations for the erection of a quartz-mill at that point. Thirteen men are now employed doing preparatory work. The Pellaton gravel mine is promising well. The shaft down to the gravel is over 100 feet in depth. The gravel bed, so far as explored, averages about four feet in thickness, and rich with coarse gold, pieces of three and four dollars in value being found to the pan, while frequently small pieces of gold can be picked from the face of the drift which is being run on the channel from the bottom of the shaft. The drift has yet been run but a very short distance and no cross-cutting yet done, therefore the extent of such gravel is not known, but there is sufficient knowledge of the ground upon which to base the belief that there is good pay there for some time to come.

Union Copper Mine.—Stockton *Independent*, Oct. 13: Colonel H. D. Ranlett of Oakland, manager of the Union copper mines for the Eastern owners, passed through the city yesterday on his way homeward, after an inspection of the work being carried forward at Copperopolis. The mine-owners are expending a vast amount of money to increase the facilities for properly working the mine, and will soon have roasting and leaching works in operation and expect to smelt 130 tons of ore daily. Colonel Ranlett had charge of the mine 19 years ago, when it became necessary to shut down because of the low price of copper and the expensive system of working which made it necessary to ship the ore to Europe. When the price of copper advanced about two years ago the mine-owners consented to carry out the Colonel's plans and open the mine with a view to making improvements to work the ore at a profit when the bottom should fall out of the market. While reopening the old mine the manager shipped the ore as it was handled 20 years ago when Meader was a local copper king, and carried forward his plans to improve the property. About 60 men are now employed in and about the mine, and the manager expects to be able in a short time to work from 150 to 200 men. The work of putting in new machinery is being rushed and the leaching works are about completed. Colonel Ranlett hopes to handle 400 tons of ore daily when all of his plans shall have been carried out. Copper is now very low, at 9¾ cents, but it is claimed that the Copperopolis mine can be made to pay with copper selling as low as 8 cents. Many of the mines of the West cannot be worked profitably with copper at the current price, but the manager says the Copperopolis mine can be worked cheaper than any other, and will now be kept open.

Inyo.

Keeler Notes.—The Independence *Index* says: Forty-five men constitute the pay-roll of the Inyo Development Co. at the Keeler Soda Works. The majority of this number is at present taking up the soda crop. Between 1400 and 1500 tons is the estimated quantity of crude soda to be lifted this year, being far in excess of last year's crop, and a much superior article.

Union.—Ore is being regularly shipped from this mine, a weekly average of 60 tons going out by rail. About 50 men are employed in and about the mine at Cerro Gordo, and things are slowly assuming shape. Owing to the steep road from Keeler to Cerro Gordo, transportation of the heavy mining timbers is slow work. We all have great faith in Cerro Gordo.

Nevada.

San Jose Mine.—The Grass Valley *Tidings* says: The developments at the San Jose mine show that the recent strike there will be permanent. The gravel is of very fine quality, and, from present appearances, is extensive.

The Hartery Mine.—The Grass Valley *Union* says: The pumping works of the Hartery mine were started up on October 8th, and the machinery worked smoothly. It will not take many days to pump the water out of the mine, when the work of cleaning out and reopening the lower drifts will be commenced.

The Manzanita Mine.—The Nevada City *Transcript* of Oct. 8th says: The rainstorm of Monday had a disastrous effect at the Manzanita drift mine just north of town. A large section broke off the face of the 500-foot bank. It will take nearly, if not quite, two weeks to remove enough of the dirt that has already fallen, so work can be resumed in the mine without danger. If the bank breaks again meantime, as it may do, the delay will be lengthened.

Gold Point Mine.—Supt. Bennallack of the Gold Point mine, Nevada City, states that a Pelton wheel for hoisting purposes is to be put in and a 20-stamp mill erected.

Paying Mine. — White Pine *News*, Oct. 12: A five-ton lot of low-grade ore shipped by Thomas Rockhill and W. R. Thomas to the Selby Smelting Works in San Francisco for trial, gave the following result: Silver, per ton, $23; gold, $3; lead, 42½ per cent. The freight by team and rail was $109 and the lead alone netted $135, being in excess of both freight and working expenses of the lot. Ore of this grade shipped to Salt Lake would have brought the shippers out in debt. The price allowed for the lead was 3⅞ cents per pound. Messrs. Rockhill and Thomas at the same time shipped a lot of high-grade ore to the same works which gave very satisfactory results.

Omaha Mine.—Grass Valley *Union*, Oct. 15: The shaft of the Omaha mine is now being sunk for the No. 10 level, and the ledge in the shaft is showing well in free gold, which gives good encouragement for the opening of the new level. The mine is looking well throughout, and is yielding handsomely. There are now over 100 men on the pay-roll, and no tribute work is being done in the mine.

Gravel at the Loami.—Grass Valley *Tidings*, Oct. 15: The pipe clay in the new perpendicular shaft on the Loami Company's claim, one-fourth of a mile west of the old incline, was cut last night. Only a few pieces of gravel were obtained, however, a strong volume of water pouring in and forcing immediate cessation of operations. The miners are positive that they have struck the channel, and an old drift miner declares that the formation is identical with that in the San Jose Co.'s mine, Washington district, where rich gravel was struck two weeks ago. The shaft on the Loami is down 70 feet. It is probable that a pump will be temporarily rigged up to enable the prospecting of the find—if "find" it proves.

Mono.

Bodie District.—The following official letters were placed on file Oct. 16: Bodie M. Co.—During the past week the east crosscut from shaft 1000-foot level was advanced 50 feet. Upraise from south drift, same level, was down 20 feet. Are stoping out ore above the 900-foot level. Mono M. Co.—The south drift 1000 level was advanced 33 feet. West crosscut No. 2 from same was down 39 feet. Bulwer M. Co.—The last crosscut from north drift 100-foot level was extended 10 feet. Are cleaning out and repairing main lateral drift 200-foot level. Put in switch in main lateral drift 200-foot level and laid track in crosscut No. 3 to raise No. 5 and started on same and extended it 11 feet.

Placer.

The Eclipse Mill.—The Placer *Republican* says: Supt. Patterson has all the machinery for the Eclipse mine at Ophir now on the ground and the workmen are busy framing the timbers for the new ten-stamp quartz-mill. There are two Pelton wheels, one for the mill and one for the hoisting works of the old shaft. It is expected that the latter will be in operation in about a week. The new east shaft is down about 100 feet, and a whim is to be at work on this shaft.

Shasta.

Mining Notes.—The Redding *Democrat* says: Tom Cummings came down from the Gladstone mine yesterday. He says the mill is running full time and the mine looking better than it ever did. George Bassett has resumed development work on the Crœsus mine on Squaw creek. He is running a new tunnel which is expected to tap a rich chute of ore. We hear a report that three prospectors very recently discovered an immense body of rich gold quartz near the head of East Fork of Trinity. The find is about seven miles a little south of west of Southern's. There was quite an excitement in Old Diggings last week over the strike in the lower tunnel in the Old Mammoth. A rich body of ore was uncovered, much of which will mill way up in the thousands a ton.

The Old Diggings.—The Redding *Free Press* says: The extraordinarily rich strike in the lower level of the Mammoth mine last week has excited a great deal of interest in the Old Diggings and among mining men in general. Every one who has seen it remarks: "It is the finest I have ever seen." Messrs. Panter and Young ground out about $60 in a hand mortar in less than two hours last week. Work done in the tunnel since the discovery was made indicates that it is not a "pocket," but the beginning of a very rich pay chute. This proves one thing—that the mines in the Old Diggings do go down. Hart & Fleming, Walker Bros., the Mammoth and the Central have always found rich rock as fast as they went down, and this is certainly encouraging to go still farther. Walker Bros.' new mill started up this week, and it is a credit to Shasta county. A new feature introduced by Supt. Rippets is "sizing the pulp," and it works like a charm. As the Walker Bros. are wealthy and influential mining men of large experience, and are spending lots of money in the Old Diggings for the development of their properties, it is naturally assumed that they know what they are about. Mr. Rippets says their mine looks better than ever. That old mining men like R. G. Hart and F. P. Saterlee, who were engaged in mining in the Old Diggings years ago, have returned to make their fortunes, is a suspicious sign. Mr. Saterlee is still running the Central mill with ore from the Mammoth dump, showing that there is money in it. Mr. S. is a practical millman and understands his business.

Slate Mine.—Redding *Free Press*, Oct. 12: At the Bank of Shasta County, and at Judge Bell's office in the courthouse, can be seen samples of the slate from F. M. Whitlow's slate mine at Delta. Judge Bell owns a third interest in the mine, which he considers valuable property. The ledge is 60 feet wide, and there is a mountain of it close to the railroad track. The only slate mine in operation in the State is the Chili bar mine, located on the south fork of the American river, five miles from Placerville. From this mine there is shipped a carload a week, for which the company receives $7 per square foot. A great deal of the slate is used by the railroad company for roofing purposes, it making the most desirable roofing. The Chili bar mine is located some distance from the railroad, and the cost of transportation to the cars must be quite an item, one that can be avoided by the happy location of the Whitlow mine.

Siskiyou.

Yreka Items.—Yreka *Journal*, Oct. 16: The Hegler boys and Bruce Aldrich started up their quartz-mill on Humbug last week, the late rains having furnished sufficient water for their batteries to keep the steam engine and mill in operation day and night. Boyle & Co. are now moving their 25-horse power engine from forks of Humbug to their quartz mine on north fork of the Humbug, and next week Mr. B. intends going to the Bay City to secure a new quartz-mill of large capacity. Charlie Abbot is still working occasionally on his ledge at Greenhorn, to ascertain if his find is not something more than a mere pocket. Wademan & Heckathorn have also been prospecting on Greenhorn to discover the full extent of their ledge, in seeking to find whether it is a permanent lode and extensive. They have now shut down operations until spring opens, when they can work to better advantage. The Quartz Hill Co. at Scott River are making great preparations for extensive work during the coming season, and have ordered considerable lumber from sawmills, for improvements in the mine, and will also fix up the mill in good running order. The miners on Little Humbug are fully prepared for extensive operations the coming winter. If favored with rain and snow to furnish water, they expect to realize a good yield of the glittering ore, this little stream being one of the richest in Siskiyou.

Trinity.

Taylor's Flat Notes.—A correspondent in the *Northern Advocate* writes as follows: Everything lively in the quartz mines. There are three 10-stamp mills going up on East Fork, and the right kind of men can get plenty of work. One of the most promising camps is expected on Canyon creek, where they are finding some fine ledges. Two men, Geo. Bailey and Grant Fowers, have three fine ledges on one location, one three feet, one six feet and one four feet, and the rock assays from $40 to $60 a ton, and if it will mill a quarter of that it is one of the best mines in the State. The tunnel company has some fine ground in the bed of the river, but they cannot expect to work much longer, as the early rains will drive them out till next summer; but they are also owners of the Taylor Flat property, and intend to put a force of men to work fixing up the flume, rebuilding the mill, and fitting up the claim. All the drift and river claims are doing well on the river, and the way they ship gold dust shows they are working good ground.

NEVADA.

Washoe District.

Belcher M. Co.—Official letter Oct. 15th reports as follows: No. 1 east crosscut on the 1200-foot level is out 71 feet, and having reached the hanging-wall, has been stopped. No. 2 east crosscut is out 64 feet. The face is in soft porphyry. Have started No. 3 east crosscut, 50 feet south of No. 1. The west crosscut on the 1000-foot level is out 88, and has reached the footwall. Have started No. 1 east crosscut on 1000-foot level, 50 feet north of the south line. It is out 17 feet in porphyry and streaks of quartz. The 850-foot level, south drift, is out 148 feet. The face is in porphyry and streaks of quartz. The 200-foot west crosscut is out 376 feet. The face is in low-grade quartz containing a little moisture.

Con. Imperial Mining Co.—Official letter filed Oct. 15th, reports that the west crosscut from the 300-foot level north drift is being repaired, and the east drift from the winze on the same level is still being driven ahead toward the Imperial new shaft for ventilation.

Challenge M. Co.—Official letter Oct. 15th, same as the one received from Confidence.

Hale & Norcross.—Official letter Oct. 15th, reports as follows: On the 300-foot level the west crosscut was advanced 25 feet, making its total 140 feet. Face is in vein porphyry. No. 3 west crosscut was advanced 35 feet, making its total length 110 feet. Face has reached the west clay wall. This drift exposes 85 feet of low-grade quartz. On the 100-foot level they are still retimbering the main west drift. On the 500-foot level east drift was advanced 20 feet. Face is in porphyry and low-grade quartz. On the 700-foot level west crosscut No. 2 was advanced 30 feet, its total length 132 feet. Face of this drift is still in low-grade ore. On the 1200-foot level the ore encountered in south drift is holding out very well. They are retimbering the 1300-foot station, and have men employed at necessary repairs at the different levels.

Savage M. Co.—Official letter Oct. 15th, reports as follows: On the 300-foot level west drift from the station was advanced 27 feet, making its total length 342 feet. Face is in clay and porphyry. On the 400-foot level have started a south drift from top of upraise; have also resumed extracting ore from north drift on this level. On the 500-foot level north drift from upraise continues in ore of good quality.

Crown Point M. Co.—Official letter filed Oct. 15th, reports as follows: The 300-foot level No. 1 west crosscut is out 20 feet. The face is in low-grade quartz. The No. 2 west crosscut (25 feet south of No. 1) is out 17 feet. The last 4 feet have been in fair-grade ore. Have started a crosscut from the 9th floor 400 south stope. The 600-foot level north drift is in 60 feet. Have stopped it and started a raise from the main east drift to connect with the 600-foot level stope for ventilation. The 700-foot level south drift is out 472 feet from the shaft or 300 feet south of No. 1 east crosscut. We are preparing to raise to the 600-foot level on the quartz 50 feet back from the face. Have stopped the 800-foot level No. 2 crosscut (which is out 83 feet), and are cutting out a wing station on the west side of the south drift between the two crosscuts. Have cleaned out the 900-foot level south drift 430 feet.

Confidence M. Co.—Official letter filed Oct. 14th, reports as follows: The Confidence, Challenge and Imperial north drift on the 500-foot level is now in 1027 feet from the Yellow Jacket shaft. Face still shows quartz and porphyry. The east crosscut from this drift is now out 192 feet. The face is in a mixture of clay and quartz.

Overman M. Co.—Official letter filed Oct. 12th, reports as follows: East drift at winze has been extended 19 feet. Formation, porphyry, clay and quartz. Upraise from 250-foot level has been advanced 37 feet on a seam of quartz. South drift on 520-foot level is in 27 feet past west crosscut, on a seam of fair-grade ore. At a point 43 feet south of west crosscut No. 4 are cutting out and timbering preparatory to sinking a winze. The material, quartz, of a fair grade. Upraise from Lambert tunnel has been extended 23 feet. No. 2 has been extended 18 feet. No change in formation. Caledonia west crosscut No. 2 has been extended 18 feet. Material, porphyry and clay.

From the Virginia City *Chronicle* the following is obtained: The strongest evidence that the ore resources of the Con. Cal. & Va. mine are showing no signs of exhaustion is the fact that extensive repairs to the California battery and pan-mills are in progress and have been throughout the past summer. The foundations under all of the batteries have been entirely renewed, the foundation under each battery being renewed separately, thus admitting of the constant dropping of 70 out of the full complement of 80 stamps. Both the battery and pan-mill are now in first-class order. Appended will be found a summary of operations in the principal mines on the Comstock lode, obtained from the official reports of superintendents during the week ended October 12th.

East Sierra Nevada.—The 520 level south drift is out 120 feet and continues in porphyry.

Utah.—On the 600 level the north lateral drift from the main west drift is advanced 725 feet; formation porphyry and quartz. The southeast drift is advanced 30 feet from the shaft station.

Occidental Con.—During the week extracted and milled 300 tons of ore showing an average assay value of $17 per ton. Bullion valued at $5621.30 shipped to Carson Mint. Concentrates on hand valued at $11,200.

North Occidental.—Continue stoping ore from the 450 level and from the winze below the 400.

Best & Belcher.—On the 550 level, east crosscut No. 1 is extended 57 feet; formation porphyry and clay. On the 1000 level the northwest drift is extended 320 feet; formation porphyry.

Gould & Curry.—On the 200 level, at a point 420 feet from the shaft, in west crosscut No. 1, a southwest drift is advanced 25 feet; formation porphyry with streaks of quartz. On the 400 level west crosscut No. 1 is extended 389 feet; formation porphyry.

Scorpion.—The 520 level south drift has entered porphyry.

Sierra Nevada.—On the 520 level from the main east drift, 1185 feet from the shaft station, a south drift is advanced 263 feet; formation porphyry with some water.

Union Con.—On the 1465 level the north lateral drift is advanced 496 feet from the south line, continuing in porphyry and clay.

Mexican.—On the 1465 level the north drift from west crosscut No. 1, 200 feet in from the lateral drift, is advanced 471 feet, continuing in porphyry and streaks of quartz with some water.

Ophir.—On the 1300 level the east crosscut from the shaft station, to connect with the top of the raise above the 1465 level east drift, is extended 200 feet, face continuing in porphyry showing some quartz.

Con. California & Virginia.—The usual quantity and grade of ore is being extracted from the various openings on the 1435, 1500 and 1600 levels. On the 1650 level—The stopes on the seventh and eleventh floors above this level continue to yield the usual quantity of ore of fair quality. Also continue stoping ore from upraise No. 2, carried up above the north drift from the bottom of the winze 60 feet below the end of the south drift. At the end of the northwest drift from the southwest drift from the main west drift from the C. & C. shaft an upraise is carried up 88 feet, and connected on the east side with the seventh and eleventh floor stopes opened on the west side of upraise No. 1. During the week 1065 tons and 1440 pounds of ore were shipped to the Morgan mill, 1645 tons to the California. The average assay value of all the ore worked at these mills during the week, according to battery samples, was $28.25.

Andes.—Quartz is still showing in 350-level explorations.

Savage.—Continue to extract ore of good quality from the 500 level. The 400 level south drift from the Gould & Curry has connected with the Savage north drift.

Chollar.—The 754 and 850 level north drifts are in hard porphyry. The 650 level west drift is in clay and porphyry.

North Gould & Curry and East Best & Belcher.—Usual progress reported in advancing the northwest drift to connect with the North Gould & Curry workings.

Potosi.—The 850 level south drift continues in hard porphyry.

Ward Combination Shaft.—The 1050-level shaft station is completed and a west drift started.

Alpha.—The 500 level west crosscut continues in low-grade quartz. The shaft is down 80 feet below the 500 level.

Exchequer.—The 382 level east crosscut continues in porphyry.

Yellow Jacket.—The 500 level west drift is out 710 feet. Daily ore shipments average 50 tons.

Seg. Belcher.—The 1100 level east crosscut is in 320 feet, and is in soft porphyry streaked with quartz.

Silver Hill.—The 160 level northeast crosscut continues in quartz and porphyry. No change in formation in the 260 level northwest drift.

Baltimore.—Encounter occasional bunches of ore in 338 and 225 level explorations.

Caledonia.—West crosscut No. 2 is in 52 feet, and has entered vein porphyry.

Justice.—Crushed 220 tons of ore of the usual assay value.

Alta.—Crushed 300 tons of ore, assays showing a value of about $30 per ton.

New York Con.—Ore still showing in the raise above the 800 level west crosscut. Have a large area stripped ready for extraction.

Candelaria District.

Probable Purchase.—Mining prospects are looking up at Candelaria. The English company, which owns the waterworks and a 30-stamp mill, is negotiating for the purchase of the Holmes mining property. There is strong probability that the sale will be made, and if it is the camp will soon boom again. Candelaria is far from being a dull camp. As it is, about 170 miners are employed there, and that means a good deal of business.

Mt. Diablo Mine.—The official letter from the Mount Diablo Mine, Candelaria district, for the week ending Oct. 10 is as follows: There is hardly any ore showing in the stope between the fifth and

sixth levels. The north crosscut from the east drift in this intermediate is in 11 feet, and shows a few inches of $50 ore. The main stope between the fourth and fifth levels is giving a little ore of fair grade. The west stope between the third and fourth levels shows a few inches of $40 ore. The east stope on the third level shows a bunch of $70 ore, about three feet wide. The winze between the second and third levels west is down 42 feet, and shows a little ore in the bottom. The winze between the first and second levels, east of the shaft, is down 11 ft., and has connected with the east drift on the second level; there are bunches of $50 ore showing nearly all the way down this winze. The east stope above the second level shows a foot of $40 ore. We have started a south crosscut in the west intermediate between the first and second levels, and are now in 22 feet. The intermediate above the first level east is giving considerable $50 ore. The mill has been running steadily during the week.

Jumbo District.

TO START UP. — The Virginia City *Chronicle* says: The new stamp-mill at the Wild Goose mine in Jumbo district will soon be started crushing ore. The water for amalgamating purposes will be obtained from the water company's flume.

Golconda District.

GOLCONDA MINES.—The success of the Adelaide company in developing that copper mine at Golconda has stimulated the management of other equally promising locations in that district to resume operations. The Great Republic and New Star have a force of six men employed, and the prospects are promising that these mines will soon be producing copper and silver bullion.

Pioche District.

REDUCTION WORKS.—The Pioche *Record* says: The force of men employed at the reduction works is now large, and progress, though steady, is slow. The great drawback now experienced is the grading which is necessary for roads, etc., immediately in the rear of the works. The smelter addition is practically finished, and work on the stack is now being pressed. The brickwork is into the second floor. At the present rate of progress, the smelter will be in operation by Oct. 25th. Coal and ore are being put in in quantities, and a successful experimental run is expected. A new building to be used as an assay office is in course of erection between the works and the present assay office on the summit. The starting of the furnace is an event eagerly looked for, as it is generally recognized that on the result much of our future prosperity depends.

Tuscarora District.

BELLE ISLE.—*Times-Review*, Oct. 12: The west crosscut on the 250-foot level is extended 12 feet.

NORTH BELLE ISLE.—The shaft has been sunk and timbered 13 feet; total depth below the 400-foot level, 148 feet. The rock continues very hard and the water-flow is about the same.

NORTH COMMONWEALTH.—The joint crosscut on the 225-foot level is extended 16 feet. A drift has been started south from this crosscut 215 feet from the shaft. The face shows some good ore. South drift on the 100-foot level is extended seven feet.

NAVAJO.—The crosscut from the south drift on the 350-foot level is extended 10 feet. The upraise at the south end of the same level is extended eight feet. The mill will start in a few days on ore from the mine and custom ore.

DEL MONTE. — A crosscut has been started east at the end of the north drift on the 225-foot level and extended 10 feet. The joint crosscut on the same level is extended 16 feet. East crosscut No. 2, on the 100-foot level, is extended 15 feet. The face continues to show high-grade ore.

GRAND PRIZE.—On the 400-foot level a winze has been started in the east drift from the north crosscut in the ore showing in the bottom of the drift. The ore continues good in size and quality. A stope has been started in the south drift for the extraction of concentrating ore, and is looking well. The 500-foot levels are being cleared out and put in shape generally. Work on the concentrator is being pushed and is rapidly nearing completion.

COMMONWEALTH. — The hoisting engines have been repaired during the week and put in first-class order. The engines being stopped has retarded the work. Started hoisting Tuesday. The upraise from the north drift has been extended up 14 feet, passing through very high-grade ore. The top of the raise is still in vein formation. The east crosscut from the north drift has been advanced four feet, all in ore. The north drift from No. 5 east crosscut has been extended 10 feet. The south drift from No. 15 chute is advanced 16 feet; total, 43 feet. Fifty feet of the north drift on the 100-foot level has been retimbered.

ARIZONA.

OLD DOMINION CO.—The Globe *Silver Belt* says: The Old Dominion Copper Co. has purchased a new water-jacket furnace, to replace one that recently gave out. The new furnace will reach Globe very soon. Operations at mine and smelter proceed with accustomed regularity.

PHŒNIX MINE.—A New York telegram of Oct. 10th says: The stockholders of the Phœnix mine of Arizona met yesterday and listened to the report of the Reorganization Committee which was appointed in December last. They empowered the trustees to make such additions to the plant as they might deem necessary, and instructed to begin the work at once. Over 300,000 shares of the mine were represented at the meeting.

QUIJOTOA MINES.—Official letters report as follows: Weldon—The progress has been fair during the week in shaft No. 4. The vein in the bottom shows no change, with the exception of considerable more copper stain, without any change in grade. Crocker—Ore of fair-milling grade continues to be extracted from the various stopes on the different levels, some of which show strong, and others continue to be considerably mixed with country and talc, which requires sorting. During the week, the repairs on tramway being completed, commenced moving ore to the mill, which will start up as soon as some repairs to the machinery are completed. Peer—Twenty-one feet has been made in the north drift from west side tunnel during the week, making 96. No change of importance since last report. Face in vein matter of low grade. Peerless—Eleven hundred level west lateral drift from No. 1 crosscut south, total length, 30 feet, advanced 22 feet. No. 1 crosscut north, total length, 28½ feet, advanced 3½ feet. Twelve hundred level west drift, total length, 78 feet, advanced 18 feet. East drift, total length, 250 feet, advanced 5 feet. No. 1 crosscut north, total length, 7 feet. A portion of the week men have been taken from the mine to do other work. Formation of a favorable nature is being encountered in bottom of shaft and crosscut No. 1 north on the 1200 level.

ROGERS DISTRICT.—Florence *Enterprise*, Oct. 12: Mr. Charles Ceslinger arrived this week from the Rogers district, about 15 miles northwest of Silver King, in the Superstition mountains. He is employed, with several other miners, in developing a group of six mines belonging to Judge J. D. Reymert. The work is being done under the supervision of Mr. Atchison, who recently arrived in camp with his family from California. The developments now being made are designed to exploit the ore body with a view to the ultimate erection of a mill. The former owners of these properties shipped considerable rich ore which netted handsome returns, notwithstanding the distance from the railroad shipping station. The two shafts upon one of the group have caved in and become dangerous from the heavy rains of the past season, and work is being done only in the tunnel, which is now 300 feet long. The ore is free-milling chloride and carbonates, in granite formation, and the lowest assay yet had from the pay streak, which runs from six inches to three feet, is 100 ounces in silver. From this value it runs way up into dizzy figures. Mr. Ceslinger is of the opinion that a very important mining camp will spring up at this group of properties and that it will prove one of the best and richest in the Territory.

GOLD CANYON MINES.—Silver City *Enterprise*, Oct. 11: Mr. Harris, surveyor from Kingston, with a corps of assistants, is at Clifton, Arizona, surveying the Gold Canyon group of mines, locating mill-site, water-flume, etc. W. C. Tonkin has gone to Chicago on business connected with the development of this property. A test run recently made by the Gold Mountain mining company, in a five-stamp mill, of 34 tons, gave them 24½ ounces bullion, 850 fine, or about $18 per ton on the plates. This property is on the same big veins and adjoining the Gold Canyon company's properties.

PRESCOTT MINING NOTES.—*Courier*, Oct. 14: The different ledges around Dosoris are contributing considerable high-grade ore. The rain will enable managers of Crowned King, Oro Bella and Ryland mills to keep them going. It will also set several placer mines to producing. Supt. W. A. Farish thinks he can work 300 tons of Vulture tailings every 24 hours. Yuma Copper Co., whose properties are on the edge of the desert, have artesian boring machinery on the ground. Prospector McNary thinks he has discovered plenty of cinnabar ore in Copper basin, 12 miles south of Prescott. Sterling Co. of Tombstone has made a shipment of 3000 ounces of silver.

BRITISH COLUMBIA.

NELSON NOTES.—Kamloops, B. C., *Sentinel*, Oct. 12: The Hall mines have sustained their reputation by a return of over $300 per ton for a shipment of 40 tons of ore. A tunnel lately run in at a low level on their property struck the ledge according to calculations. Well-defined walls were found and a streak four feet in width of ore of very high grade. They are now picking ore for another shipment. The Eagle Gold Co. are making preparations for treating gold ore on a large scale. According to assay, their ore is very rich. Part of their machinery has arrived and they have on hand about 70,000 feet of sawn lumber for roofs, ore-bins, sluices, etc., the walls of their principal buildings being of logs.

COLORADO.

IDAHO SPRINGS MINING NOTES.—The Colorado *Mining Gazette* says: Over six feet of ore has been uncovered in the lower workings of the Oneida mine. A contract to sink the shaft an additional 100 feet has been let by the operators of the Anglo-American. Some very fine gold-bearing quartz is being taken out of the shaft of the Falcon mine, on Ute creek. The ore shipments from the Lamartine for the month of September exceeded those of any previous month. The new plant of machinery for the mine is being hauled by Ed Moscript under contract. The Ben Harrison in its recent rich strike is another illustration of the necessity for systematic development in the prolific Ute creek country. A recent run of ore from Black Prince, Brown gulch, netted 220 and 122 ounces silver according to class. Morganthau has 130-ounce ore in the Diamond tunnel. The Everett management will erect a concentrator. The Coin lode in Brown gulch is looking well. The Mint is working quite a force of men. Ore nets from 200 to 300 ounces silver. Stevens working steadily and holding her own. Runs high in lead, low in silver. Total gross output of Mendota mine to date, $410,000. Other aggregate total outputs of Mendota group, $200,000.

DAKOTA.

NEWCASTLE COAL.—Deadwood *Pioneer*, Oct. 9: The Deadwood Central is experimenting with Newcastle coal. Day before yesterday two and one-quarter tons were received, and enough more to make an even 20 tons will arrive as rapidly as teams can be secured to haul it. The company proposes to practically test the heating powers in its locomotives. For this purpose 20 tons are deemed sufficient. As the *Pioneer* has before stated, the coal is the best ever mined in the west. It will doubtless prove satisfactory to the railroad company, and will probably be adopted as fuel.

TO TREAT REFRACTORY ORE.—Deadwood *Pioneer*, Oct. 9: Since the subject of pyritic smelting has been agitated, and the assurance is given that a large plant to treat refractory ores by the process will soon be built in Deadwood, numerous inquiries have been heard as to where the necessary pyrites for fluxing will be obtained. An answer presents in the statement that the Homestake and Caledonia mines alone furnish upward of 150 tons per day, which would be sufficient for the purpose of keeping one plant of large capacity in unceasing operation. The supply, however, is not confined to the mines named. City creek locations can furnish a quantity sufficient to flux 1000 tons per day for years to come. If success of the enterprise depended only upon the quantity and quality of ore obtainable, the question would have been solved long ago. Needed capital has been all that is lacking, and this it is generally believed will be forthcoming in a very brief while.

IDAHO.

MINERAL CITY NOTES.—A correspondent of the Baker City, Oregon, *Democrat* writes as follows: The mines of the camp are large, containing extensive ore bodies; the ore is base. The precious metal is principally silver, from a trace to $3 or $4 in gold. The chief bases are manganese, sulphur and iron with antimony, arsenic with some lead carbonate, the latter very scarce. The formation or country rock principally porphyry with some trace of lime and slate. There is one mill in operation, the Egan. The method of treatment is dry crushing, chloridizing, roasting, leaching and precipitating with some modifications now called the Russell process. There is every reason to believe that the process will treat the ore successfully. Prof. Lang's smelter will, we understand, start up on the first. It will also be a success, but may possibly be a little more costly than other methods of treatment. Our belief is that the proper and most profitable method of treating the ores of this camp will be calcining and matting.

OWYHEE DIAMOND-FIELDS. — Boise City *Statesman*, Oct. 12: Secretary Curtis has among the archives of his office certain documents relating to the discovery of diamonds in Owyhee county, which fully establish the fact that a considerable number of diamonds, some of them of great value, were found in the Owyhee diamond-fields in the summer of 1865. Among these documents is a correspondence between Caleb Lyon of Lyonsdale, then Governor of Idaho, and a Mr. Russell of New York City, a well-known dealer in diamonds and other precious stones. Secretary Curtis passed a week with Gov. Lyon in examining the field and was present when Gov. Lyon made the selection which was sent to the New York dealers. This correspondence, with extracts from the message of Gov. Lyon to the third session of the Idaho Legislature, showing the importance of the discovery, will be published in a future number of the *Statesman*. Gov. Lyon had traveled extensively in Europe, Asia and Africa, and he told Secretary Curtis that the Owyhee diamond-fields gave indications of containing richer deposits of diamonds, opals, rubies and other gems than any other source of precious stones that he had examined.

MILL FOR THE TIPTOP MINE. — Wood River *Times*, Oct. 9: Ole Rorem got back yesterday from Salt Lake City, where he had been for the purpose of securing capital with which to put in a mill for the Tiptop mine. He succeeded. The mill, which is of the Huntington pattern, will be set up in the Wiswell mill building, on the Donovan group of mines, the Idaho Gold Mining Co. having leased the building to the Tiptop people on condition that they make a few test runs of Donovan ore during the winter. Next spring, if the tests have proved satisfactory or demonstrated that the proposition is a paying one, both companies will either unite in building a mill that will have a daily capacity of 150 tons, or put in enough Huntington mills to crush that quantity. The mill now to be purchased by the Tiptop people will have a daily capacity of 15 to 20 tons. It is of a make which is rapidly superseding stamps, because it does better work and at less expense. The Tiptop is not at its first test. Several tests of its ore have been made, and one of these at the Sullivan mill on Deer creek. Nineteen tons crushed there this summer yielded over $14 per ton in free gold, and the concentrates yielded at the rate of $337 per ton. As to the ore, there is an enormous quantity in sight. To begin with, there are over 1200 tons on the dump, by actual measurement and reckoning 20 cubic feet a ton. On the 100-foot level the ore vein shows from four to five feet in width and over 300 in length, and a winze already proves the continuance of the ore for a depth of 20 feet below, anyway. This winze is about to be sunk 100 feet, and a drift will be run from the bottom, which, when connected by a drift 300 feet long with another winze sunk at what is supposed to be near the further extremity of the ore body, will show up a block of ore sufficient to keep a mill of 60-ton daily capacity crushing steadily day and night for a year. And if the test alone referred to is a reliable indication, this block of ore would have a value of over $300,000.

NEW DISTRICT.—Caldwell *Tribune*, Oct. 2: T. H. Callaway confirms the various rumors afloat this summer concerning the strikes made near the head of Ten Mile and various other creeks in Western Elmore county. He prospected several of the most important leads himself and says they are immensely rich, and that one lead for which $2500 was refused for a one-third interest before any development work was done, runs from $60 to $300 per ton in gold. This lead is from 10 to 20 feet wide and is the largest yet struck. It has been located for two miles. A number of others of equal richness have been found. Placers that return 25 cents to the pan have also been discovered, but these, unfortunately, lie too high to be worked advantageously. Mr. Callaway also states that he has made a location on South Boise that prospects way up; that this region bears the best indications of mineral of any he has ever seen and has no doubt that it will be the scene of great mining activity in a few years. The new mining district has for years afforded summer range for Boise Valley stock and a large number of our cattle men have doubtless ridden over the rich quartz veins thousands of times. Mr. Callaway says that what development work has been done tends to strengthen the belief that there are some good properties in the new district.

LOWER CALIFORNIA.

ALAMO DISTRICT.—The *Post* of this city says: W. J. Sheridan, the well-known mining expert, has just returned from another visit to the new Alamo district in Lower California. He is inclined to take a more favorable view of the camp than he did before. It has assumed, he says, a more permanent appearance. All work is now confined to quartz mining, and ore is being extracted from several of the claims. The principal locations are the Princessa, Ulysses and Telemacho, which are owned and worked by the International Co. The latter claim has the largest and best defined vein exposed at present. The shaft is down about 50 feet, showing the ledge to have a width of 7 feet at that depth. The ore is very rich in sulphurets, causing the owners to put in concentrators, which are now in course of erection, near their Huntington mill. Two other claims, the El Paso and Texas, are owned by a Texas company. Their formation is very promising, the ore showing free gold. This company is erecting a first-class 10-stamp mill. There are four small mills in operation at present, with an aggregate crushing capacity of from 30 to 40 tons per day. As several prospects have given out at a short depth, it will be necessary to sink at least 50 feet below the present deepest workings before any reliable opinion can be ventured as to the permanency of the ledges. Owing to the stringent mining laws of the country, which compel owners of claims to employ six men daily for six months in the year, the poor prospector has little chance to take up claims. The revenue laws also militate against the prosperity of the camp and cause considerable annoyance to merchants and shippers. All books and accounts must be kept in Spanish and every article of merchandise must be stamped with local stamps. There is also what may be termed an inter-municipal revenue law, which works a great inconvenience to travelers. Governor Torres extends every courtesy to all who come in with the intention of developing the resources of the country. Were this camp on the other side of the line, there would be over 1000 people there to-day. If the ledges go down, it is generally believed that there will be a lively boom in this district by next spring.

MONTANA.

THE MOUNTAIN QUEEN.—The Butte *Inter-Mountain* says: The Mountain Queen is shipping considerable ore into this city, going about $1100 in gold and silver per ton.

THE CUMBERLAND MINE.—A correspondent of the Butte *Miner* says: The Cumberland is breaking the record in turning out bullion. The smelter is 40 tons capacity and it has turned out as high as 21 tons of bullion in a day. It is running about $50,000 a month now and will clear at least $15,000 per month. We now talk of building a 60-ton smelter in the spring and will build it at the mine. We think that with a smelter on the ground and a few other advantages that we will have next year we can make about one-half of the output clear—it is now about one-third clear. We now think we will begin working the mine next spring and continue it right along. It takes about 30 teams, 10 horses to the team, to haul the bullion to Livingston as fast as we can make it. That is 300 horses, and there are fully 50 more hauling ore, wood and coal, so you can see it is starting quite a business.

A BIG PLACER DEAL. — The *Inter-Mountain* says: John F. Cowan and wife have sold to the Silver Bow Hydraulic Mining Co. all their right, title and interest in the following placer claims and water rights: The Washington, Adams, Madison, Monroe, Jackson, Van Buren, Harrison, Tyler (lots 384 and 503 of the latter being excepted), the O'Neill, South Placer and East claims, the Weibold water ditch and Pioneer ditch, together with their water rights; the consideration of said purchase being 300,000 shares of the capital stock of said company.

NEW MINING CO.—The High Tariff Mining Co. has been formed in the Oro Fino district. The capital stock is $1,000,000 in 500,000 shares at $2 each. The principal office of the company will be at Champion. The company's property is the High Tariff mine, adjoining the Champion mine on the northwest. At 40 feet the assays show 60 ounces silver, and the pay streak is 3½ feet wide.

NEW MEXICO.

HILLSBORO ITEMS.—The Kingston *Weekly Shaft* says: The Thompson & Galles mill at Hillsboro is now dropping 20 stamps on ore from its own mines, and is cleaning up about $15,000 per month. The company is putting in place an additional 50-horse power steel boiler. As soon as the connections are made the 20 stamps will be started up, as also the copper slimer. The Daily & Chandler mill at Hillsboro started up Tuesday on ore from the Animas Peak Mining Co.'s, and it is thought that an eight-months' supply of ore has been secured.

A BIG STRIKE.—Silver City *Enterprise*, Oct. 11: F. Bellm, of Central district, has made a gold strike which lays all others in the shade. He has fourteen feet of a dry talcy ore which runs into the hundreds in gold. A large portion of the lead will run several thousand dollars to the ton. There is no question as to quantity. Mr. Bellm and his partner worked this mine many years ago, and although they made money rapidly, they did not get along well together. The "partner" brought several hundred dollars in gold into this city and squandered it in a single night, so disgusting Mr. Bellm that he refused to have anything more to do with him. Finally he left the country and the workings on the mine caved in. For several years past, Mr. Bellm has been hunting for the lead, and has spent $1100 in finding it. His fortune is now assured beyond a question.

OREGON.

THE BUFFALO MINE.—The Pendleton *East Oregonian* says: Wm. Conklin, an employe of the Buffalo Mining Co., is in the city from the scene of operations on the Buffalo ledge. He says they are getting out some very rich ruby silver and gold ore up there, preparatory to shipping a carload to Denver for reduction. The ore sent is expected to average $350 to the ton. The object of the Buffalo mine-owners is to fully develop their ledge and lay bare its riches. With this purpose in view, a tunnel to tap the ledge at a point 380 feet below the surface is now being excavated.

UTAH.

THE WOODSIDE MINE.—Park *Record*, Oct. 12: Operations are going on merrily at the Woodside, both in the vicinity of the leasers' old workings and at the new shaft. The hoisting plant is a model of completeness and promises to do effectual work. It is expected that the machinery will be started up the latter part of the coming week, after which developments will proceed faster than ever. Ere long the Woodside's ore shipments will rival the heaviest producers in camp as formerly. The payment of dividend No. 1 has, as might be expected, increased the market value of the stock.

MECHANICAL PROGRESS.

Hints on Hammering.

A correspondent of the *American Mechanic* furnishes that journal with some very interesting notes on the use of the hammer on shafts, rivets, etc. We collate as follows:

The particular manner in which a piece of metal yields to a blow depends upon the hardness, the weight, and the speed of the thing with which the blow is struck. A machinist straightens a shaft by striking the high side with a heavy, soft hammer; he straightens the same shaft by striking the low side with a light, hard hammer. The heavy, soft hammer acts more as a slowly applied pressure, or like a screw press, and takes out a bend by bending in the opposite direction. The light, hard hammer dents, or penes, and in consequence lengthens the low or short side, which straightens the shaft. Now a shaft can be straightened with a heavy, hard hammer, if it be heavy enough to bend the shaft more in the direction that it strikes than it tends to pene the shaft in the opposite direction. For any given shaft there is a size of hard hammer that will pene in one direction as fast as it will straighten in the other, and without a change in tendency, a man may hammer the shaft and his lifetime away and accomplish nothing.

Hammer Riveting

Is merely a series of dents. The particular manner in which pieces are riveted depends upon the weight or pressure, and the speed of the thing that does the riveting. Before riveting machines were made, hand-hammers were used, which were often more effective than the operatives were efficient. Two blows of a 4-ounce hammer would shorten a rivet so it would be nearly or quite even with the piece that it was supposed to hold, but it would not be right, because its body would be enlarged the whole length and be only slightly tapering, a little larger at the end, but not enough larger to hold. Some experiments were reported to the correspondent by Mr. C. H. Norton, the inventor of a riveting machine, in which the inventor tried light hammers, weighing about 1½ ounces each, which formed heads on rivets of some sizes without enlarging the bodies; but these hammers were still too heavy for the smallest rivets. Some of the 1½-ounce hammers were cut off at each end, leaving them one ounce, which proved to be light enough; but the operatives did not like to have them so light, because so many blows had to be struck to form a rivet head. When Mr. Norton was not near, the heavier hammers would be used by some operatives and the riveting would be worthless. Such stimulants to morality as are kept in workshops for cases in which a lack affects the employer, were administered. Reward was offered to informers, discharge was threatened to bad riveters. Another trouble came, not so much through lack of morality as through lack of skill. Among the pieces to be riveted one to another were many eccentric washers, called glass clamps, for holding glass plates, the edges of which were placed under the clamps while riveting. A wild blow, uneven hammering, or too much hammering, would break a plate.

The riveting machines afforded relief from all these troubles so far as the employer thought that his interest was concerned, though they did not, essentially, advance the operatives either in skill or in morals.

Before a successful machine was made it was found that the helve must be neither too stiff nor too heavy, but that it must yield somewhat when the cam strikes the lift. If the lift does not yield enough, it will wear away the cam almost as quickly as if turned in a lathe. One cam was destroyed in less than ten minutes.

If the helve and the hammer are too heavy, and, in addition, the helve is too stiff, the hammer, by one stroke of the cam, will be thrown so high that it will not come down before the cam has made several turns. If the hammer is not light enough, it will not answer to the spring quick enough to strike a blow that will do the work. Mr. Norton learned the curious fact that, within certain limits, the lighter the hammer the more work it will do It is the quick blow of the hammer pulled down by the spring that does the work; if the hammer be too heavy, its inertia will be too great to be overcome by the spring quick enough to do any work in the fortieth part of a second. It would appear that, though the hammer is heavier than a hand-hammer for doing the same work, the blow is largely taken by the cam, and in consequence the work done upon the rivet is like that of a small hammer. A solid metal helve that was stiff enough was too heavy. A wooden helve worked well while it lasted, but it was soon splintered. The thing that finally answered every purpose was a piece of gas-pipe about seven-eighths of an inch in diameter. The length of the strike of the hammer should be from one-eighth to one-quarter of an inch.

HOW ELECTRIC WELDING MACHINES ARE PLACED ON THE MARKET.—A recent issue of the Boston *Herald* stated that the Thompson Electric Welding Company believes it has passed the experimental stage and has now begun to do business for direct revenue. Its career has been brief, and dates from April, 1888. It was only in January of this year, when it became settled in its new factory, that the company settled down to work. It has now some 75 welding machines built and in use or in process of construction. Not a single machine has been returned to the company for failure to accomplish what it was expected to do. The company builds the machines and leases them for a price to equal their cost. It then charges a royalty for each set of welding, and the machines are self-registering. It has taken some months for the company to determine the basis of royalties, and for obvious reasons. The general principle established is that the company shall receive 33 per cent of the saving of this method of welding over the old methods, but this method being entirely new, it could not be told without experiment what the gross saving was. Until now the company has made little effort to place its machines. It will now set agents at work and cultivate the field systematically. What the revenues will be cannot be told exactly, but they promise to be large.

English Versus American Axes.

An English gentleman who has for some time past been traveling in Australia calling on the principal hardware firms, writes to the editor of the Sheffield *Telegraph* to know why English firms cannot produce an ax equal to the American. The English editor answers that there is no comparison between English and American axes; that he had personally seen them tested by a blacksmith, who with each ax struck several blows on a bar of Derbyshire iron. He says the steel of the American ax was soft and "crumpled up" when brought in contact with the bar, whereas the English ax retained its edge intact, and made its mark cutting into the iron.

The *American Manufacturer* says that Pittsburg ax manufacturers are inclined to smile at such statements as those made above. They admit it is quite possible that the English ax is more of a success at chopping bars of iron, but the reason for its superiority on this point is very apparent. It is much heavier than the American article, and by its wedge-like form is calculated to stand such severe tests, owing more to the characteristics mentioned than to material or workmanship.

It seems, however, that a woodman's verdict on the merits of woodmen's tools, is after all the most correct, rather than that of a smith, however well-informed the latter may be in his own way. The American ax is made with a view to practical results, not to take the place of a cold chisel or to be used as a combination of the two, but as a wood-cutting tool, and for this purpose it is superior to the English make. To get the English ax into a shape where its efficiency would be equal to the article turned out here would require a great deal of grinding, for the American tool when it leaves the factory is ready to be taken into the woods and put to work without any preliminaries. Whether its work is satisfactory or not is a question which is best answered by the number of sales made by our manufacturers.

The inquiry of the English traveler indicates the preference of the Australian consumer, but does not show what is equally true, that the American ax has taken the lead in the Australian market, where it is given the precedence on account of the great efficiency and its superiority in style and finish. This lead it has maintained for some years and still holds. Pittsburg axes are now sent to Australia in greater numbers than ever before, and the trade is constantly growing.

THE ENGLISH COMPOUND LOCOMOTIVE.—The advent of the English compound locomotive in America has had the effect of stirring up considerable thought and some action in the matter. At least two locomotive works in the country are each building a compound for trial purposes. This is what is needed for a satisfactory comparison of compound with simple engines, as these engines will be of the American type, with the exception of being compound. Discussing the subject further is of little use; nothing but a fair trial can settle the question. If it is demonstrated that the compound locomotives will do the work with less fuel, and otherwise work satisfactorily, there are parts of the United States where the cost of coal would make their use a matter of a good deal of importance. Engineers will be strongly interested in an impartial trial of the two systems.

ALLEGED IMPROVEMENT IN CASTING PIPES.—A Wakefield (English) foundryman's patent is said to abolish sand in casting pipes. "In superheated steam or gas-jacketed metal molds," pipes are cast which are uniform, sound and true, as if turned or bored by a lathe. The pipes so cast are not porous, and they have other excellent qualities, it is affirmed.—*Glasgow Engineer.*

A HINT ON BELT MANAGEMENT.—It looks as though a hint should be taken from the way a dynamo is set up. The belt is made to run as tight as may be desired by screws that crowd the machine to one side, and instead of a loose pulley the belt is slacked up enough to be supported on a frame that slips over the shaft pulley.

MACHINERY IN TURKEY.—In order to encourage manufacturing industries, the Turkish Government has decided to admit all machinery and tools free of duty for the next 15 years.

IT is stated that there are 5000 steam boilers in use in San Francisco.

SCIENTIFIC PROGRESS.

Underground Waters as Mineral-Formers

The mode of formation, or, as Buffon said, the genesis of minerals, is one of the most interesting questions of their history. But the problem could not be approached until geologists had furnished precise data on the conditions of their bearing. Satisfactory solutions have recently been obtained in the case of a certain number of mineral species. Synthetic experiment, placing itself in the circumstances that seem to have presided at their formation, has succeeded in reproducing them, with their crystalline forms and all their essential characteristics, and has thus completed the demonstration of their origin. By means of this method of demonstration we have been able to ascertain that many minerals are due to the action of subterranean waters. From the most ancient epochs these waters have circulated through the crust of the earth, where they have left, at a multitude of points, signs revealing the part they have played and the course they have taken, even more clearly than contemporary phenomena have done.

The sedimentary beds, formed like the deposits which the sea spreads every day in the bottom of its basin, are often distinguishable from one another, even at first sight, by certain exterior characters. The differences are for the most part produced by the action of subterranean waters, as is demonstrated by the animal and vegetable fossils, which were for a long time designated as petrifactions, or rather by the chemical changes which these fossilized bodies have evidently undergone.

Here shells and corals, showing forms perfectly preserved down to their slightest details, are no longer composed of carbonate of lime, as they certainly were during the life of the animal to which they belonged, but are essentially different substances, quartz having entirely taken the place of the calcium carbonate. There are also other minerals, such as pyrites and sulphate of baryta, which have penetrated and crystallized within the cavities which the bodies of these invertebrates occupied.

A Theory in Regard to Steam.

Prof. J. F. Elson recently communicated to the *Iron Trade Review* a very interesting theory in regard to steam, from which we collate as follows:

If one takes a beaker full of water and mounts it on a tripod above a flame and suspends a thermometer in it, it will be observed that the water gradually gets hot. Suppose we begin with water as a melting point of ice, that is to say, 0° C., its temperature, as evidenced by the thermometer, will gradually ascend until the boiling point of water, viz., 100° C.= 212° Fahr. When this point is reached the temperature will refuse to go higher, and to all intents and purposes, the water refuses to receive any additional heat. Notwithstanding this the heat keeps pouring from the flame as before, and still the water receives none of it, at least it gets no hotter. At last, however, a point is reached when the water suddenly springs into steam; then, and not till then, the temperature will again begin to ascend and arise from degree to degree as the flame below warms it. But what became of the heat from the flame from the time the water reached the boiling point until these gases began to escape is really of more importance to steam-users and steam-buyers than what becomes of the treasury surplus of this nation.

When heat has raised a quantity of water from nothing to the 100°, it then ceases to make itself evident in the ordinary way of affecting temperature, and takes effect by doing the work of separating the particles of the water and bringing them into the condition they are in, in the form of steam, an invisible gas, until cooled off by the surrounding atmosphere. The steam once produced, as it can be brought into no more attenuated condition by work in the form of heat, is immediately affected thermometrically by heat and then gets hotter and hotter as thermal increments are applied to it; the heat which, when it enters the water makes it no hotter, but affects it by doing work on its particles, is recognized by engineers as latent heat; the ordinary variety of heat (not that there are more than one kind of heat existent in any objective way, the effects only of the one thing being of two kinds), namely, that which when entering into the water causes it to get hotter in proportion as it is applied, and is denominated by engineers sensible heat.

The great point, then, wherein the modern steam engine, even of the very best type and most skillful manufacture, falls very short of a perfect machine, utilizing more than the merest fraction of the merits of heat represented in the fuel consumed, is, that the whole of the heat of the steam used in it is thrown away and lost, and notwithstanding the fact that heat must be constantly applied at one point of the engine, namely, where steam is generated, yet, at the same time, heat is being continually gotten rid of and thrown away at another point, namely, at the exhaust pipes.

When steam, say of 60 pounds' pressure, is generated in a boiler, the water it is produced from is first raised to 100° at a great expenditure of fuel, and then an enormously greater amount of heat is required to be passed into it before it can be made to assume the gaseous condition. On acting in the cylinder, the steam loses its energy and falls from 60 pounds' pressure to that of the atmosphere, and then is thrown away, with all its heat, into the air, or, at last, has its sensible heat retained by condensation, while the whole of its latent heat is thrown away with every stroke of the circulating pump.

Some time ago I stated in an address delivered to a society of steam engineers, that "it is apt to be taken, a priori, as an impossibility to recover or utilize the heat of exhaust steam, or in any way to plan an engine in which all the heat or potential energy of the steam shall find its way back, in one form or another, to the boiler. However, there are thinkers and experimenters of authority who hold there to be no inherent impossibility in the matter, and, in all probability, a time will come when a solution of the problem will be lighted on by some one. It only needs to be said that a fame and a fortune, second to none that the century has brought forth, awaits the happy inventor when he does appear.

"Various attempts have been made from time to time to solve the problem under notice. The principle of the injector seems, on the first view of it, to be one by which the steam in a boiler can be made, by its own energy, to force in vapor against its own pressure. However, the real rationale of the injector's action is that of merely condensing a portion of the steam in a boiler, and throwing a feed-water to take its place. To inject feed-water at a higher temperature than is consistent with its condensing the steam it is brought in contact with, is an impossibility, unless extraneous forces are made use of, in which case as much work will inevitably be destroyed as it is sought there should be recovered.

"It is argued by some that the steam engine has been brought to such a state of perfection, and has already attained to such a ne plus ultra condition, that very little more is possible to be done to it by any one. But so far is this from being the hard, cold fact, that were the problem I hinted at but solved (and it is not a visionist's wild vagary to say it will be some day), a steam engine would then be possible which would be to the present engine what Watt's engine was to Hero's Eolipile. Am I not correct?"

HOW CAN THE EARTH BE WEIGHED?—One way is to place a pair of scales in the top of a tower and attach to each plate a wire which passes through a long tube to a point about 60 to 100 feet below. To the lower ends fasten other scale plates, within, say three feet of the ground. Under one of these lower plates put a ball of lead about three feet in diameter. To prove that a body weighs more when near the earth than when farther away, it is weighed in one of the upper scale pans with the weight in the opposite lower one; and then the weight and body are changed in place and weighed against each other again. Then the weights are taken with the ball of lead taken away. This shows the influence of the ball of lead at a given distance; from this there can be determined the attraction of the earth alone; and taking diameters and distances, it may be ciphered out what the earth weighs in tons; also, what its average specific gravity is. This method was devised by Jolly, who calculated the mean density to be 5.692, which agrees quite closely with other determinations, especially that of Bailey, which is 5.67.—*Ex.*

SUNSHINE.—The aggregate number of hours during which the sun is above the horizon during the year at the Greenwich Observatory, in England, is 4465. The record during the year 1888 shows that only 1068 hours were sufficiently clear for observations. The hours which are sufficiently clear for night observations always average less than by day. From these statistics it would appear that less than one quarter of the hours of both day and night are available for astronomical observations at that observatory. We are not aware that any reliable statistics of hours suitable for observations have ever been published in regard to Mount Hamilton, but it is safe to say that the facts are the reverse of those of Greenwich—that less than one-quarter of the hours are so obscured as to render observation impossible, instead of more than three-quarters as at Greenwich.

DISSOLVING STONE.—From St. Paul, Minn., comes the statement that Angus Boorfried, a Bohemian stone-cutter residing in that city, has discovered a combination of chemicals by the use of which the hardest stone can be dissolved and cast into any desired shape, the casting being as hard as flint, translucent and capable of taking on a brilliant luster. It varies in color according to the stone used, and can be had from a bright red to a beautiful azure blue. While in the fluid form, it can be used for coating anything having a stone or glassy surface. Mr. Boorfried will start for the East in a few days to secure the backing of wealthy capitalists.

FOR SCIENCE.—Emperor William of Germany has given the amount of 30,000 marks to the expedition under Dr. Henson, to explore the submarine fauna and flora of the ocean. The east coast of Greenland is to be the first cruising ground.

IN order to make the quick time that the fast steamers are now making across the Atlantic, 400 tons of coal per day are consumed.

GOOD HEALTH.

The Bulging Brow.

It Does not Have Anything in Connection With Intelligence.

"That man has a fine forehead," I said to-day to a friend on the street, as a person with a perpendicular forehead of great amplitude passed us. But my friend, who was a physician and something of a phrenologist, remarked: "Humph! not necessarily. There is not a more groundless fancy abroad in the land than that about fine foreheads. Any man of ordinary reading and observation, if he will reflect for a moment, will see that a perpendicular forehead is not an invariable accompaniment of great intellect, and that a narrow or retreating forehead is not always a sign of mental weakness. Some of the greatest men that ever lived, whose genius and force of character have exerted the greatest influence on history and civilization, have had these low or retreating brows, which are popularly called weak foreheads. The list of them includes Alexander the Great, Frederick the Great, Savonarola, Sir Thomas Browne, Calvin, Bunyan, Darwin, Emerson, Gambetta, Lafayette, Washington, and even Lavater himself, the founder of phrenology, who says that perpendicularity of the forehead indicates coldness of temperament and a want of capacity, while a retreating forehead is a sign of originality, brilliancy of conception and moral courage." As I was not ready to dispute my friend's theory, and indeed had no interest in doing so, I merely passed my hand proudly over the upper end of my physiognomy and bade him good-morning. —*Chicago Journal.*

POISON RINGS were formerly often resorted to to put enemies out of the way. In Italy the poison ring was carried to the perfection of a malicious imagining. The "Anello della morte" was occasionally resorted to as a means of putting an enemy out of the way. A hollow point in the bezel, worked by a spring, communicated with the receptacle behind for the poison in such a way that its villainous wearer could, in giving his adversary a hearty grasp of the hand, inflict a mortal scratch. The point was fashioned to look like an ornament. So deadly and enduring was the poison contained in these rings that some 20 or more years ago death was nearly occasioned by handling one unwittingly. A curio fancier was turning over gems in a shop in Paris, when he fell fainting, and was with difficulty restored. It was found he had been wounded by a poison ring. This instrument of destruction was also worn in perilous times, in order that the owner might commit suicide rather than fall into an enemy's hands. Another kind was furnished at the back with a slide, which could be slipped back by the wearer, who would drop the poison into the wine he offered to a hated guest. This kind was affected by Cæsar Borgia, whose own signet ring bore an inscription little suited to his character: "Fais ce que dois, aviez que pourra." Another form of poison ring was the one which had for its bezel the key to a casket. The wearer would hand his ring in a confidential manner to a visitor, and desire him to hand him some article from his jewel-box. The key, in being turned in a somewhat stiff look, would give the unwary confidant a prick, which had for him fatal results.

WORKING WITHOUT WORRY.—One meets few unworried people. Most faces bear lines of care. Men go anxious to their day's duties, rush through the hours with feverish speed, and bring hot brain and tumultuous pulse home at night for restless, unrefreshing sleep. This is not only a most unsatisfactory, but is also a most costly mode of living. The other night the train lost two hours in running less than a hundred miles. "We have a hot box," was the polite conductor's reply to some impatient passengers who begged to know the cause of the long delays at stations. This hot-box trouble is not altogether unknown in human life. There are many people who move swiftly enough and with sufficient energy, but who grow feverish and are thus impeded in their progress. A great many failures in life must be charged to worrying. When a man worries he is impeded in several ways. For one thing, he loses his head. He cannot think clearly. His brain is feverish, and will not act at its best. His mind becomes confused and his decisions are not to be depended upon. The result is that a worried man never does his work as well as he should do it, or as he could do it, if he were free from worry. He is apt to make mistakes. Marks of feverishness are sure to be seen somewhere in whatever he does.

SHALL SUSPENDERS BE WORN?—Here comes another point that the freeman must consider. Shall he wear suspenders or not? That depends. Upon what? Upon three things, says the Cincinnati *Enquirer*. First, upon his size and shape. If the man is stout, with a generous girth of waist, he should unhesitatingly stick to his suspenders. If he is slender, with a fair width of hips, he can go braceless with impunity. Second—Does he intend to wear a waistcoat? If so, suspenders may or may not be worn, depending upon the freeman's preference. If he discards his waistcoat, he must let his suspenders go too—if he can. Third—Will he buy his trousers ready made? Then let him buy a pair of suspenders also. Suspenderless trousers must be made to order. They must fit the hips snug and close. If suspenders are discarded, a belt of narrow silk should take their place. This may be concealed by a broad belt of folded silk, but this is no cooler than a waistcoat, and while it lends to the wearer the picturesque appearance of a stage pirate between the acts, any sensible freeman will discard it without a moment's hesitation.

VIRTUE IN PEACH LEAVES.—Italian women, both at home and abroad, make much use of peach leaves as a condiment and medicine. The New York *Herald* of a late date says that Italian women have been collecting peach leaves in South Brooklyn during the past few weeks, their object being to concoct out of the dried leaves a tonic, which may be used either with food or as medicine. These women hail from Naples and other parts of Southern Italy, and retain in this country the many quaint old customs which make them so interesting a study to the historian and antiquarian. Among those customs is that of gathering peach leaves for medicinal purposes. "I don't know how old this custom is," said Mr. L. Brigandello, an Italian interpreter, to me yesterday, "but it is certain that many generations of Southern Italian women have practiced it. In almost every country there are persons who believe in the curative powers of certain roots and plants, and in Southern Italy especially such believers are, and have always been, very numerous. As to the peach leaves, I don't know exactly how the medicine or tonic is made out of them. As to the peaches themselves, I may tell you that in Southern Italy a good deal of prussic acid is extracted from the kernels." From other sources I learned that these Italian women make many strengthening drinks and drugs from various roots and plants, and are thus ready at a moment's notice to administer a dose of home-made medicine to any members of their families who may be in need of it. It naturally follows that they seldom invoke the assistance of regularly licensed Italian physicians. "Indeed," said an Italian editor to me, "a physician finds it hard to make his living among these people, and this fact largely explains why many Italian physicians in this city find it hard to make both ends meet."

IS LEPROSY CONTAGIOUS?—There seems to be much difference of opinion among physicians in regard to this question, and the death of the Catholic Father, who went among the lepers at the Sandwich islands to look after their spiritual welfare, has been referred to as a strong proof of the affirmative of the question. Quite recently, however, it has been stated, on apparently good authority, that the lamented Father Damien attributed his leprosy to the inoculation of an abrasion in the scalp through the agency of flies.

USEFUL INFORMATION.

Water Filtration.

John A. Caldwell in a late number of *Science* furnishes the following useful information in regard to water filtration:

Probably at no time has the condition of the water supply of our cities and our towns received more attention than at present, and perhaps no one thing has conduced to this state of affairs more than the discovery that certain salts contained in the earth act as renovators of all so-called "spring" waters, purging them, so to speak, of the foul matters held both in solution and in suspension.

Up to the time of this discovery it was thought that the earth acted merely as a filter or strainer on a large scale, and that each grain or atom of earth acted its part toward opposing or arresting impurities in the passing water—in other words, that only mechanical straining or filtering took place and nothing more.

Multitudes of filters have been made and put in operation in all ages and countries with the expectation of seeing the water emerge from them as pure and sparkling as from a good "spring," and the greatest surprise has been manifested at the failure to secure the same results when apparently every condition was supplied. The question remains: "Was every condition supplied?" Modern science answers, "No."

The peculiar action of the salts above referred to upon the portion of impurities said to be held in solution is well illustrated by the effects produced by dissolving soap in a water of great (so-called) hardness. The white flakes that almost instantly appear are composed not alone of dissolved soap (for soft water would not show such individualized flakes), but a mixture of soap and some substance hitherto held in undisturbed solution in the water, but now withdrawn from that condition and floating about in mechanical suspension. It will be plain that if this soap-treated water was now poured into the earth at one point, and made to emerge at another some distance off, it would be found purged of not alone the soap it contained, but also of the modicum of foreign matter held in its embrace, and which went to make up the quality of hardness spoken of.

This subject is so little (generally) understood that it seems necessary to use the above illustration for the benefit of the casual reader, although to the chemist 100 different applications of the same law will suggest themselves. Indeed, it is noted here for the purpose of calling more emphatic attention to the simple fact that water may contain impurities in absolute (chemical) solution, and that such impurities, by the addition of another substance, may be rendered tangible and capable of withdrawal from the water by purely mechanical means.

Equally clear and understood should be the statement that water may contain impurities in a state of fine (mechanical) suspension—so fine that they would flow wherever water would flow—and these, by the addition of another substance to the water, be made to flock together into groups, a thousand or two into one (as clouds are condensed into drops); and that one, with its fellows, be tangible, and easily removed from the water by purely mechanical means.

It follows, that if the earth contains in abundance this "substance," which has the dual property of disengaging matter held in solution, and rendering the same tangible, and also of curdling together matter held in so fine a state of division as to almost elude the senses into a state of perfect tangibility, we at once get at the secret of how nature makes the true spring-water, so wonderfully pure and sweet to the taste, as well as brilliantly clear and inviting to the eye.

What is this substance or substances? Usually some combination of lime, iron, potassium, aluminum, etc., with other bases, such as sulphur or carbon—all existing naturally in the great mother matrix, the earth.

The almost universal diffusion of the aluminiferous earth (red clay) makes that substance take a more prominent place among the agents above alluded to. Water cannot flow far in any part of the world without encountering in its course the coagulating or curdling effect of this single element. Some of these clays are more heavily charged or freighted with aluminous compounds than others. Waters fouled by such are more quickly subsided. In this fact we have a clue to the explanation of why it is that of two different waters showing the same degree of turbidity from clayey impurities such impurities will subside quickly in one, while in the other they may not subside in months. As proof that the quick subsidence is due to the presence of these salts, we have only to add a minute proportion of such (usually aluminum sulphate) to the other water to produce the same effect. Hence, when water issues from the earth in a very clear and perfect state we may always be sure that it has encountered somewhere on its travels a body of earth or mineral containing a suitable coagulant, the action of which coagulated upon the water accounts for its wonderful purity aside from and entirely independent of the mere filtering effect of the earth.

It has remained for the present decade to apply the above knowledge to the *art of filtration of water*, and for the first time produce results equal to nature.

As this industry extends it will become a common thing to see "spring" water issue from our city faucets, as is already the case in a few American cities, notably Atlanta, Long Branch and Newport.

The study of this subject furnishes a striking example of nature's exhibiting, in the humble wayside "spring," the results of her perfect handiwork for the observation and admiration of man throughout all ages and countries, only to deliver up her secret to the pale student of this century of science.

ARE WATER-FILTERS USEFUL?—Concerning this subject, the following article will be found well worth consideration: Dr. G. T. Swarts has placed before the Rhode Island Medical Society the results of a series of experiments with water-filters, the gist of which ought to be given wide publicity. It is quite common belief that a domestic water-filter, the operation of which will produce clear water, is a valuable acquisition. But the doctor's experiments show that most filters, when first used, remove part of the organisms from the water, but in their continued use the filtered water comes to be much worse than the unfiltered. It appears that the germs remaining in the filter multiply with great rapidity, and that, instead of removing the danger from them, the filter increases this danger enormously. Dr. Swarts tried many simple means of cleansing filters, but found in every instance the filtered water was at a disadvantage as compared with the unfiltered. An interesting point in regard to this is the operation of the large filters used to filter the entire water supply of a town. It is to be hoped that the doctor will continue his investigations by determining the effect upon the water of some of those that have been in use for two or three years. It may be found that the wise plan is to go far enough to get a supply of comparatively pure water rather than to depend upon any filtering process. Reasoning from analogy, it looks, in the light of Dr. Swarts' experiments, as if the filtering process, with a view to furnishing wholesome water, was worse than useless. But it is a subject that will bear further investigation.

HINTS ABOUT FIRE.—A steamer in unloading the ashes it had made in a trip across a fresh-water lake, found the coals all bright and lively and ready to burn, after laying out in a heap all winter. A spark in a bale of cotton has mulled away for years and at last set the storehouse on fire. Those who have a forge fire to look out for during the day should throw on a handful of sawdust to assist in starting up easily, as the coal that is used nowadays lets the fire all out as soon as it lies idle for awhile.

ENGINEERING NOTES.

The English Channel Tunnel.

It is well known that Mr. Gladstone is an advocate of this project and that M. Leon Say is the chief of a French company that has already spent $400,000 for the preliminary work of piercing the tunnel.

It is more than probable that M. Leon Say will soon again play an important role in the political affairs of France. Baroness Althea Salvador writes to the *Call* of this city as follows: When M. Gladstone shall be Premier in England and Leon Say at the head of the Cabinet in France—an event possible in the year 1890—we may see Dover and Calais approaching each other by a submarine railway. This tunnel is not a new idea, for 25 years ago Queen Victoria and Prince Albert hoped that England and France would in this way be united. At that time French engineers began the work and immediately the results were satisfactory. Examination of strata under the channel proved the existence of a bed of Rouen chalk deep enough to offer a sure quarantine against infiltration, and through this it was found that a perfectly dry gallery could be perforated. The work of digging near Calais was accomplished at the rate of 30 meters in 24 hours, and never had a similar operation succeeded so well. At the Simplon only five or six meters were finished in one day, and it was natural that the company thought the way prepared for ultimate success. The French Parliament passed a law by which the company had permission to use the tunnel for transportation of passengers and freight during 99 years; that is, one-half of the tunnel (ten miles) would belong to the French company, one-half to the English company.

At first public opinion in England favored the enterprise and two rival syndicates were formed to study on the English coast what had already been proven in France. The same stratum of Rouen chalk was found, and in order to make success certain the rival companies united.

Then came fear. Lord Wolseley spoke of the dangers for British safety, from a military point of view, were there a tunnel under the channel, and as this speech was everywhere echoed in England, there was a veritable panic. Not long after the British company was forbidden to continue its work, and affairs remained in statu quo. Although every effort was made to win the consent of the authorities, when the bill was brought before the House of Commons it was defeated.

The French people watch with interest all debates in England referring to the tunnel; but it seems that more than ever the English wish their country to remain an island, more than ever do they fear an invasion from the French, should the submarine railway be made.

In vain does Mr. Gladstone tell his compatriots that during ten centuries France was many more times invaded by England than England by France; the bills are always rejected.

The French ask what they shall do—wait until their neighbors become sensible, or follow M. de Lesseps' advice, who said: "I received no authority to work on the Suez canal, but the day it was finished the concession was granted. Make your tunnel, and when it shall be finished the British Parliament will authorize you to begin work!"

A GREAT ENGINEERING FEAT.—One of the most astonishing engineering feats of modern times will be the railroad to the summit of Pike's Peak. The final surveys have been completed and construction will be commenced shortly. The route will be about 9¾ miles long, and will follow the old trail a large part of the way. The road will be built upon the same principle as the one that ascends the Rigi in Switzerland. It is calculated that the ascent and descent will each occupy about 1½ hours. It will be run entirely for the accommodation of tourists, and there is no doubt but that it will be crowded to its full capacity during the summer season, as the view from the summit of Pike's Peak is probably unequaled in America.

THE HUDSON RIVER TUNNEL.—There are 250 men constantly employed at the great tunnel under the Hudson river, and within the next 15 months it is calculated that people who are in a hurry to reach Jersey City from New York will enter a hole in the ground, to be excavated somewhere in the vicinity of Washington Square—the terminus on the New York side—and be shot under the Hudson river to their destination in a twinkling.

CANALS VS. RAILROADS.—The Washington *Star* says that people living along the line of the Chesapeake & Ohio canal could buy coal for $2 50 per ton when the canal was in operation; now it comes by rail, and they pay $5. There is the same advance in all kinds of transportation rates. It is a wise plan to hold on to the canals.

INCREASE OF OUR MACHINERY TRADE IN MEXICO.—According to Minister Ryan, the people of the United States furnished Mexico with machinery valued at $462,384 in 1880, and $4,000,000 in 1887.

THE PANAMA CANAL.—It is stated that the Government of Colombia will not renew the De Lesseps grant when it expires in 1892.

MINING AND SCIENTIFIC PRESS.

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W. B. EWER.....SENIOR EDITOR

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Our latest forms go to press on Thursday evening.

SAN FRANCISCO:
Saturday, October 19, 1889.

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Partner Wanted—M. E. Peterson, Igo.
Band Coupling—Wells, Russell & Co.
Assessment Notice—Gray Eagle M. Co.
Situation Wanted—G. S., Box 2517.

☞*See Advertising Columns.*

Passing Events.

The rainy season appears to have set in in earnest, for our advices at this writing report a general rainstorm in the valleys and snow on the mountain ranges. The snow deposit gives assurance of a bountiful water supply for mining purposes.

On Oct. 15th over seven inches of rain fell at Encinitas within the short space of 20 hours. This is the heaviest rainfall within the recollection of the oldest inhabitant.

At Ogden natural gas was struck on October 12th, while boring an experimental well for gas.

A large steel stem for the new cruiser San Francisco was successfully cast the past week at the Pacific Rolling-Mills. The stem weighs about eight tons. It will be put into the San Francisco some time during the coming week. The casting was witnessed by Lieutenant-Commander F. P. Gilmore and Lieutenant G. M. Stoney of the United States navy (who have, on behalf of the Government, charge of the steel work done at the Pacific Rolling-Mills), Superintendent Noble, and several others.

THE warship Pensacola sailed from New York Oct. 16th, having on board the scientists bound to witness from the west coast of Africa the total eclipse of the sun next December.

The National Silver Convention.

The National Silver Convention, which is to meet at St. Louis on November 26th, is attracting widespread interest, but not more so than its importance deserves. The convention will most unquestionably draw to it the more prominent bimetallists of this country, whose advocacy of free coinage of silver should throw more light on the subject of bimetallism. That silver is a leading product of the United States does not admit of a doubt, and as such should be protected, particularly when by that protection neither the financial nor business interests of the country are injured, but, on the contrary, would be greatly benefited. In previous editorials the MINING AND SCIENTIFIC PRESS presented an array of facts and figures which are convincing to the most skeptical of the wrong perpetrated by the demonetizing of silver. It was conclusively shown that when, about 17 years ago, the United States joined the knightly crusade against the white metal by demonetizing it, it was made possible for a few London brokers to work an injury upon this and all silver-producing countries that it will take years to overcome. These brokers were given the power by this country's action to dictate from day to day the price of silver, and the lower they sent it, the larger their gains. From above par they have succeeded in sending the price down fully 25 per cent. In their endeavors they have been ably supported by both England and Germany, the former by reason of its securing cheaper food for its artisans and cheaper raw material for its manufactories, and the latter owing to the financial stab its hated enemy, France, would receive through the depreciation of its principal metallic currency.

The protection of silver is not only demanded on its own merit as a product of this country, but also to protect from unjust competition in the world's market many leading products of the farm, particularly that of wheat and cotton. To such an extent has the decline in the price of silver depreciated the value of wheat in the U. S., by allowing Indian and Russian wheat to be landed in the European demand markets at very low prices, that only in exceptional years is wheat farming profitable. This is well illustrated by an editorial in a recent number of the Philadelphia *Record*, in which it is stated that the New Hampshire State Commissioner of Immigration officially reports the abandonment of 887 farms in that State, owing to their owners finding them to be unprofitable. Commenting on this very unpleasant fact, the Salt Lake *Tribune*, Oct. 13th, tersely says that "by giving the English, through the demonetizing of silver, power to pull down the price of the metal, Congress gave them also the power to dictate the price of every other production of our country, and so everything has fallen in precisely the ratio that silver has. Even cotton has fallen in the same ratio, though our people have increased 48 per cent since then, the people of Europe having increased by 20,000,000 souls, and cotton manufactures have increased 50 per cent, while the production has increased but 25 per cent. Through this the price of farm products have fallen so low that there is no longer any profits left to the farmer, hence the abandonment of the farms."

Probably no more auspicious time could have been selected for holding the National Silver Convention. We have visiting us leading representatives from sister American republics and nations—all having a silver currency. A strong and more decided movement looking to the remonetizing of silver will knit them to us in bonds of stronger friendship, and if we go still further and adopt an international silver currency, this friendship will be the more secure, and their principal trade attracted to us. But looking from this country to Europe, we find that the time selected for holding the convention is well chosen, for in both England and Germany bimetallism is being more freely discussed, and any light thrown on the subject while being discussed during the convention, will be eagerly caught up and disseminated by the friends of silver in those two countries. There is no question but the sentiment abroad toward silver is undergoing a radical change. We find in England leading financial papers advocating the Bank of England holding a certain percentage of its reserve in silver. Not only are they avowed advocates of this, but they go still further and favor the issuing of smaller certificates than five pounds sterling against the silver so held. Leading papers in Scotland are also advocating the policy of allowing their banks to issue certificates of smaller denomination against silver. Perhaps one cause of the change of heart is to be found in the fact that India, in manufactures and manufactured goods, is not only becoming independent of England, but is taking much of the trade heretofore enjoyed by the latter. The jute bags of Scotland have given place to the jute bags of India, while the Indian cotton fabrics are making fast inroads into the trade controlled by English manufactures. Again, in several English colonies silver is being mined, and as no country looks with more careful consideration after the general welfare of its people than England, the growing feeling in favor of silver can in part be attributed to the fact that many of her subjects are directly interested in the industry.

Mineral Character of Land.

Because some surveyor has returned land as agricultural, or some surveyor-general has it marked on a map as agricultural, it does not follow that it is too late to prove it to be mineral, provided it is found to be so. The Commissioner of the U. S. Land Office himself once, in commenting on the unreliability of some of these reports, gave a list of 35 mines, the lands embracing which were returned on the official township plats as agricultural in character. The existence of mines there was not made known to the Land Office until after the receipt of applications for the mining titles. The Commissioner said: "With the kind of returns furnished, it is totally impossible to determine whether any given tract in the mineral district is properly agricultural within the meaning of the law or not, or whether this office could, with a due regard to the execution of the law, proceed to patent such agricultural land without further investigation."

The returns of the surveyor are not conclusive as to the character of the lands, for the Commissioner of the General Land Office in carrying out the policy of the General Government in the disposal of the public lands, allows affidavits as to the character of the lands to be made, or impeachment of the returns of the surveyor. In a ruling made by the Secretary of the Interior, in 1879, he uses the following language: "Section 2318 of the Revised Statutes provides that in all cases lands valuable for mineral shall be reserved from sale, except as otherwise expressly directed by law. Whether or not the lands entered by Culver were such lands is a question of fact to be determined by proofs, and it is immaterial that they had been previously borne on the official records as agricultural lands."

Another Secretary of the Interior also said: "If the lands were, in truth, mineral, I think the fact that they had been previously borne on the official records as agricultural lands was immaterial."

In a recent ruling in March of this year, the Commissioner of the General Land Office said: "The fact that these lands were returned by the Surveyor-General in 1865 as agricultural does not conclude anything. The functions of that officer are purely ministerial, not judicial. Issue having been joined upon the correctness of the return, a hearing has revealed the fact that certain portions of the tract are mineral, thus showing the return to be erroneous."

Of course it is necessary in cases like this to bring proof of the mineral character of the land. The trouble is, that unless some one is directly interested, patents issue to such lands on ex-parte statements, and thus more or less mineral land is placed out of reach of the prospector. But because land is classed by officers as agricultural, it will be seen by what has been said it does not necessarily prevent any miner from having an opportunity to prove to the contrary.

OUR FOREIGN TRADE.—Foreign imports at this port during the first nine months of the year were $39,599,000, against $37,617,000 during the corresponding period of 1888. The foreign exports were $28,786,000, against $27,732,000 last year. Our imports this year were $10,800,000 in excess of our exports. The specie imports by sea during the first nine months were $4,871,000, against $3,018,000 last year.

Assessment Work.

There is a certain class of miners who grumble at our mining laws because they compel a certain amount of work to be done every year. This provision was only grafted on to our general laws in 1872, when it was found to be a necessity. Before that the matter of expenditures was left entirely to the miners of each district. But evils grew out of that system which it was necessary to do away with and the "annual expenditure" feature was introduced into our laws.

This feature has worked well. It prevents men holding on to a lot of ground for years without doing any work. Now, to hold a claim legally a man must work it. Of course there are ways by which the law is evaded, by practical abandonment and relocation, but there is more or less danger of losing the claim in this way.

Every year when this annual expenditure is made, we hear of numbers of "strikes," which in itself would go to prove the wisdom of a law that enforces work. The Government gives these claims to miners for them to work, not to speculate with, and it is much better for the country and for the mining industry that the claims should be developed.

The laws have not yet been changed as to the date for annual expenditure, the first day of January still being the period set. It behooves miners who still have the work to do to begin it at once and not wait until the last moment. A heavy storm on the mountains might add greatly to the inconvenience of working such claims as are at high altitudes.

Mining Progress.

Quartz mining in this State is now conducted in a much better and more systematic manner than ever before. There is no longer any careless extravagance in carrying on operations as a general thing. It is recognized as a legitimate business and not so much of a speculation as formerly. We know more about gold-quartz mining and have things down to finer points than we used to. Rock is now mined and milled for one-quarter the sum it was 25 years ago, and the percentage saved is much greater.

The milling processes are highly improved, which is greatly due to the improved appliances in vogue. The concentrates are saved carefully and utilized, no good mills now being without improved concentration.

But above all is the fact that the old days of extravagance are gone by. When money is spent the company knows what it is spent for. The superintendent is a man who understands his business and not some pet of a prominent stockholder.

Some of the Eastern companies still suffer from this plan, however, though we Californians have long ago found that this kind of superintendence was of the worst. There are now plenty of skilled mining men in charge of mines and mills, and who make it their steady business, not taking it up as a mere speculation to make all they could out of a company in a year or two.

Altogether our quartz-mining industry in this State is in a very good condition. This season we have suffered somewhat for lack of water, but this will be remedied with the advent of winter.

Standard Pans and Settlers.

(*Continued from page 297.*)

gear and arrangement of spindle step are the same as on the pans. The shoes are worked close to the bottom, but do not touch it, and on account of the angle at which they are placed form a strong undercurrent which sweeps the bottom, thus saving wear and tear. Quicksilver bowls are provided the same as in pans. The settlers are fitted with heavy wrought iron sides and are connected together near their tops in a similar manner to the pans. The cone is cast with the settler bottom and is made very wide at its base with the shoes working close up to it, thus preventing accumulation of settled pulp on the bottom with the clogging and breakage liable to ensue. The entire surface of the bottom between the base of the cone and outer groove is swept by the shoes. These pans and settlers are part of the outfit of the Boss continuous-process quartz-mill made by the Fulton Iron Works of this city.

Working an Iron Mine.

The "Felling" System Instead of Timbering.

The Chapin iron mine, Lake Superior, was first opened in 1880 and has since yielded almost 2,000,000 tons of soft blue hematite from three separate lenticular deposits. The largest of these is 2500 feet long and 130 feet wide in the middle, from which it gradually narrows to the pointed ends. As this main deposit pitches away from the eastern part of the property, it is replaced by another lens, containing ore of the same quality. It is separated from the extreme east end of the main deposit by about 30 feet of clay slates.

The ore was first moved by "steel stoping," a method quite common in the Lake Superior hard-ore mines; but it was very soon found that this way of mining was impracticable, both on account of the great width of the ore deposit and also on account of the soft nature of the surrounding rock and of the ore itself.

Another method was then adopted, which was called "the modified Nevada system." The shafts were still kept in the ore and protected by heavy shaft pillars, and the excavations were made secure by timber, though in a different manner. After mining had been carried on for three years, and 750,000 tons of ore raised, part of the mine commenced to show signs of crushing, and it became apparent that it would not be safe to open new rooms at a greater depth, so the modified Nevada system was abandoned. Mr. Per Larsson of Iron Mountain, Mich., describes the system in use in this mine in a paper read by him before the American Institute of Mining Engineers.

It was decided to adopt one or two of the old standard filling systems that had been successfully employed in similar European mines for a great number of years. One consideration that helped bring about the change was that the supply of heavy timber near the mine was becoming exhausted.

To make the change, new shafts had to be sunk, and new arrangements made for handling the ore. Two new shafts "B" and "C" were started 300 feet from the ore in the solid dolomite on the hanging-wall side, and crosscuts were driven from the mine to meet these shafts.

In order to keep the standing room pillars in place, and thereby prevent new caves, the drift on top of the ore was excavated and dumped into the rooms through small shafts sunk into the "back" of each room. This work was successfully completed except in the west end of the mine, where three room pillars gave way and let in the roof. The other pillars are now being mined under the filling system. Fig. 1, page 299, shows a general geological map of the mine; Fig. 2 is a longitudinal section showing workings on the main deposit; Figs. 3 and 4 illustrate the filling systems; and Fig. 5 illustrates cross-sections showing geology.

In opening new ground, two of the different methods of mining, where rock-filling takes the place of the ore, have been employed, viz.: Longitudinal back-stoping with filling (the *Firstenbau* of the Germans) and transverse back-stoping with filling (*Querbau*). Fig. 3 illustrates the first of these methods, and Fig. 4, the second.

The work preparatory to stoping is about the same in both these methods. From the shafts sunk in the hanging or footwall, crosscuts are driven to the ore and connected by drifts running some 20 or 30 feet from the ore, either in the hanging or footwall rock. Owing to the regularity of the Chapin ore deposits, these drifts can be run perfectly straight for long distances, at a nearly uniform distance from the ore. In regard to the location of these main drifts, it has been found necessary in the Chapin to place them on the footwall side of the ore. An attempt to locate them in the hanging-wall failed. The rock that takes the place of the ore yields somewhat under the weight of the hanging-wall, whereby heavy layers of the latter are broken off from soapy slips running with the stratification. No timber can be put in strong enough to resist the pressure caused by this movement of the ground. The footwall drifts have not shown any signs of crushing.

At the time the main levels are driven, smaller drifts are run in the ore, and from time to time connected with the rock drifts for ventilation.

If the ore is firm and not over 20 feet wide, which seldom happens, the full width is mined lengthwise on the trend of the deposit. As the stope advances, filling is trammed from a temporary chute at the bottom of the rock winze in small cars, and dumped near the breast of the stope. In this way shoveling is avoided. To accomplish this the filling must be kept at least five feet from the roof, or far enough to allow the trammers to pass under with their cars.

Where the ore is wider than 20 feet, the filling must be kept close to the back. The miners then proceed in the following manner: On the first stope different parties commence to work 50 feet from each other in the ore drift run parallel with the main level, and make cuts about eight feet high and nine feet wide clear across the ore. If the ground is weak, props or sets of light timber are put up as the cuts advance.

These openings are then filled with rock, either before or at the same time as other cuts of the same size are made, alongside of the first

FIG. 5.

CROSS SECTIONS, SHOWING GEOLOGY.

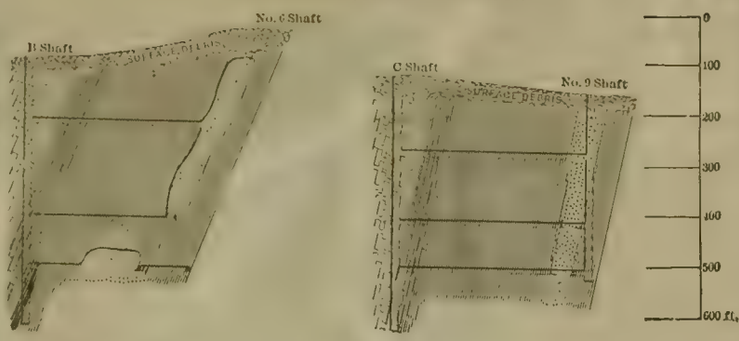


FIG. 2.

LONGITUDINAL SECTION SHOWING WORKINGS ON THE MAIN DEPOSIT, CHAPIN MINE.

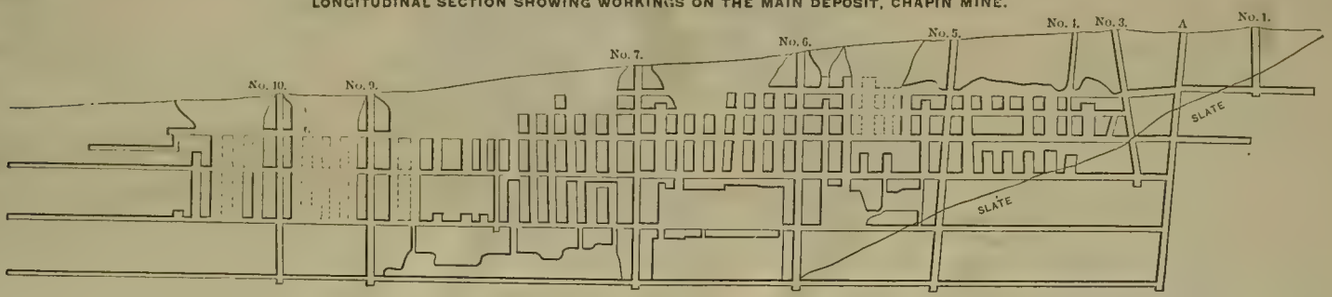


FIG. 3.

TRANSVERSE BACKSTOPING WITH FILLING, IN CHAPIN MINE.

Scale: 60 feet to the inch.

Ore
Slates
Filling

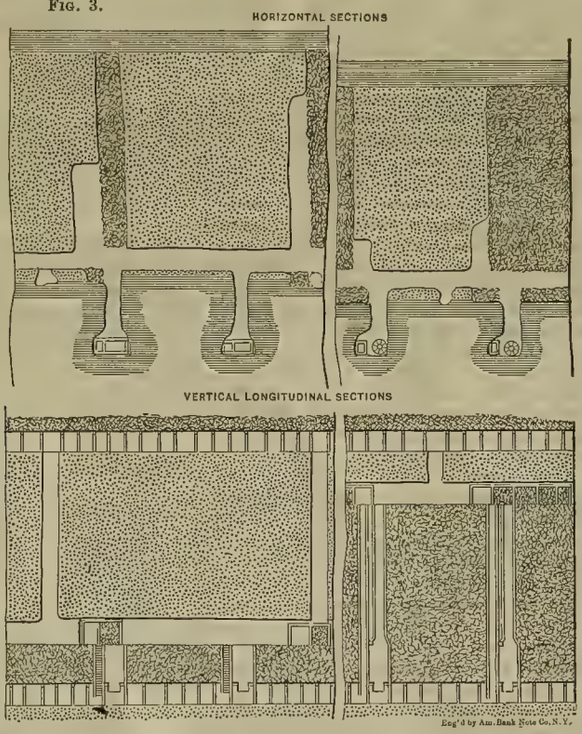
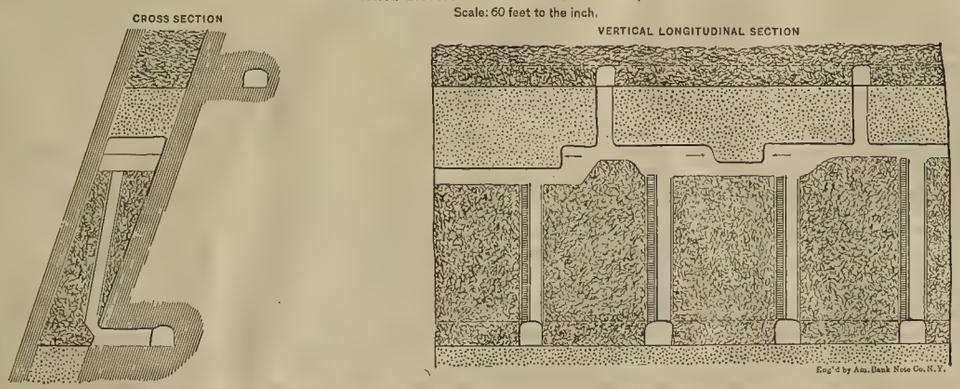


FIG. 4.

LONGITUDINAL BACKSTOPING WITH FILLING, IN CHAPIN MINE.

Scale: 60 feet to the inch.



THE ROCK-FILLING SYSTEM APPLIED IN PLACE OF TIMBERING IN MINES.

ones. A third slice is then taken off, and the second is filled in the same manner; and so on, until the whole first stope is mined out. As the filling must be kept close to the back, in order to prevent caving of the ore, it is necessary to shovel most of it. It should, however, be borne in mind that, as solid ore is mined and loose rock takes its place, and as the specific gravity of the ore is at least 1½ times greater than that of the rock, it is not necessary to handle more than four tons of rock for every ten tons of ore mined. As soon as the filling is put in, it is planked over.

Before work is commenced on the second stope, ore chutes and rock winzes must be prepared. Raises to be used for ore chutes and ladder-ways are made from the side of the main level to the top of the second stope, and crosscuts are driven into the ore. The ore chutes are placed 50 feet from one another, and the rock winzes are sunk 100 feet apart from the next higher level.

The first thing to do on the second stope is to connect the rock winze with the crosscut leading to the ore chute, after which the ore will be taken out and filling brought in in the manner above described. A third stope is then prepared and mined in a similar way, and so on until the whole lift is mined out. On account of the soft character and the great width of the ore, it sometimes cracks off and settles down on the filling.

If a block of loose ore is met with, it is necessary to put up drift sets and drive laths, in order to keep the ore from running.

The ore chutes are cribbed up for the first 20 feet, large enough to hold about 50 tons of ore, and then narrowed up to a size of 2½ feet square. From this point they are built circular 2½ feet in diameter, by means of wedge-shaped blocks of wood. Care is taken in dumping the ore into the chute that it is not allowed to accumulate and rise in this circular part. Ladder-ways are cribbed up on the side of each ore chute.

The rock mined in drifts and shafts is, of course, used to fill the excavations in the ore. If, however, this rock is not sufficient, suitable material for filling is obtained from a sandstone quarry near by. This sandstone is trammed to a hoisting shaft and lowered to the level next above the lift where the ore is mined. From the shaft it is trammed on this level to one of the rock winzes and dumped. It is then drawn from a temporary chute built at the bottom of this winze and trammed to its destination.

The International Congress.

Trade is aggressive; it is the vanguard of the mighty army of civilization. In its path follow law, order, religion, schools and culture. It was not the lust of conquest or a desire to teach school that sent the British merchants to India, but to secure a better market for Manchester sheetings and Birmingham hardware. Robert Clive and Warren Hastings made the printing press and missionary a possibility. Trade, like water, is hard to confine; it will make leakages, dig new channels, and sometimes gather such a force as to sweep away all the dykes and dams of a stern, restrictive legislation. It will have an outlet, if it has to climb mountains, bridge seas, shiver in arctic ice or sicken with the malaria under a torrid sky.

So we may conclude, in spite of all our fine sentiment and chivalrous courtesy, that trade is the mainspring and impelling motive that has brought together the present Pan-American Congress. History presents no grander sight than the delegates of seventeen American Powers, representing, in the language of Secretary Blaine, a region of country "whose northern limits are touched by Arctic waters for thousands of miles beyond the Straits of Behring; whose southern extension furnishes human habitation farther below the equator than is elsewhere possible on the globe," coming together, not to adjust the balance of power or to carve a helpless State between them, but to talk of the peaceful arts, the laws of thrift and prosperity and study the resources of their respective lands.

But it may be well for us not to let our hopes of immediate gains fly too high. Ever since the age of Queen Elizabeth the unknown wealth of Spanish America has acted like a spell upon the imagination of the English merchants, and to this day they have practically enjoyed a monopoly of this trade. These Spanish countries are in close contact with Europe by numerous steamship lines; they possess cheap fare, cheap transportation, and have established customers in all the markets of the Old World. The commercial habits of hundreds of years cannot be broken up by fine phrases and a few resolutions. Then let us not forget that this body of men possess no legislative power; to resolve and advise is all they can do. It may be some time before we sell an additional plow or paper of pins as the result of this deliberation.

Still this agitation will ultimately be of great benefit. Already there is a fluttering of weather-vanes and a promise of success. In 1884–85 a commission appointed by the Congress of the United States visited the most of the South American countries and came home laden with a large amount of valuable information. Since then the newspapers and magazines have had the material to keep the matter before the public. More has been said and written during the last four years on the advantages of an international commerce and political reciprocity with our South American neighbors than during all the rest of our history. The result has been seen in the fact that our mail-bags to these lands have been steadily growing heavier and the number of drummers increasing.

The immediate effect of this Congress will be, in the language of Secretary Blaine, "to draw the people of all the American nations into a closer acquaintance with each other." It is amusing what amount of ignorance exists in regard to our Latin neighbors. Not long ago a Cabinet official in a speech in New York spoke of Buenos Ayres as the capital of Brazil. Ask the first man you meet what language is spoken in Chili, and most likely he will be nonplussed. It is doubtful if there is a teacher in the public schools of this city who could answer off hand whether the Argentine Republic is a unit or a confederation of States, though a war was fought some years ago to settle the question. Speaking of the inexcusable ignorance of most of our geographers, a writer in the *North American Review* says: "The graphic and illustrated description of the wild horses roaming ownerless over pampas, which delighted the sense of the picturesque three generations ago, still remains on the pages they have always adorned, although it would be quite as appropriate and truthful to apply them to Iowa or to Illinois. The Englishmen who want to run over to New York for a little buffalo-shooting are no more ignorant than the writers of some of our standard geographies."

The condition of things in South America we may easily infer must be worse; a large mass of the people barely know that we exist, and the better classes think we are a nation full of brag and bluster, sharpers at trade, given to arrogance and bumptuousness over the Monroe doctrine, which they are inclined to resent, as, for instance, in the case of Chili during the Peruvian war. So the first thing is to get acquainted with each other; all international friendship and confidence hang on that, and were these delegates now traveling through our country studying its resources, its mechanical and industrial arts, its schools and charitable institutions, to go home without ever meeting in Congress and passing a resolution, still the visit cannot be otherwise than a great gain in social relations that will ultimately ripen into reciprocal business habits.

The Marshall monument has been accepted by the commissioners. It will be unveiled next May under the auspices of the Native Sons of the Golden West. The commission has made many improvements about the place, including fine roads. They will also erect fountains. Some of the old cannons and anvils which were used in Sutter's fort, will be placed in position about the monument and the grounds will be beautified.

The joint directors of the Comptoir d'Escompte and Societe des Metaux (French copper syndicate) have been condemned by the courts to pay to the liquidators of the bank 12,000,000 francs, to the bank directors alone 6,000,000 francs, and to the censeurs 1,000,000 francs.

Food and Overcoats. — Professor Paul Wiegert, a distinguished German, figures that seven cents' worth of food will keep a strong man in good form from day to day, and that we would all be healthier without underwear or overcoats.

The people of Oroville do not take much stock in the reported failure of the Big Bend tunnel enterprise.

A "Rubber Trust" has been organized in Boston.

The Wood Worker.

Furniture Making in Chicago.

It is not generally known, says Mr. Alexander H. Revell, that Chicago is the greatest center of furniture manufacturing in the world. It is a fact, however. Even London, with its 5,000,000 of inhabitants and all the British Dominion as an outlet, does not compare with our own city. What is more, I don't believe there is a city in the world that offers such prospects to the retail dealer in furniture. The geographical position of Chicago doubtless accounts for the development of the manufacture, and the amazing growth of the city is the secret of the retail trade.

The furniture made in Chicago is designed to catch the trade of the masses, and, consequently, is of the medium and lower grades. The average citizen does not want expensive goods. As a rule, people are buying better furniture, but still not more than five per cent of the people now buy anything that may be called expensive. Probably $35 is about the average price paid for a bedroom suit of three pieces, and $75 would not be far out of the way for the average price paid for parlor suits of six pieces. These figures, you see, are moderate, and since manufacturers in putting their goods upon the market cater to popular demands, prices tell a pretty straight story of the circumstances of the people.

"The great trouble with our furniture is not that it is machine made—all the goods on the trade are, for that matter, and the prejudice against machine work is fast disappearing—but because the lumber is not thoroughly seasoned before being made up. The green lumber is shoved into a kiln for a day, and then is put upon the market as chairs, tables and the like. A hundred green logs to-day are transformed into a thousand bedroom suits to-morrow. Shrinking, warping and cracking are inevitable, and the durability of the furniture is consequently impaired. So far as machines are concerned, many of them do work equal to first-class hand work and at a vastly lower cost.

"The profits of the furniture business are hard to estimate. On higher-class goods the margin of profit is fair, since the influence of competition is not strong in articles of fine quality. On all poorer goods, however, the dealer's gain is pretty well minimized. Net profit would not run more than from 5 per cent to 10.

"The bulkiness and awkwardness of furniture can be readily understood, and cannot help but whittle down profits. We practically sell nothing that we do not have to send one or two men to deliver. To illustrate the difference between different kinds of business, a dry-goods clerk will sell a lace handkerchief for $18 or $20, and the lady will take it home in her satchel; we sell a bureau or sideboard for the same price, but at a lower rate of profit, and have to send it out by a couple of men and a horse and wagon."

Wood-Bending as an Industry.

There are comparatively few persons outside the carriage and boat-building interest that know to what an extent the wood-bending business is carried and the management that is necessary in carrying on a well-arranged wood-bending establishment. Few know that the fine carriages they ride in are very largely made of bent wood. The felloes of all their wheels are bent, and are made in two parts. The framework of coaches and heavy carriages is nearly all made of bent stock. They are not only better made, but are more cheaply made. The frames of most of our pleasure boats are bent, and so are many of the frames of some of our finest sailing yachts. Furniture of many kinds has bent frames. All the celebrated Thonet chairs, which for comfort and beauty are not excelled in the world, are entirely of bent wood. The object of bending is twofold, saving of time and stock, and stability and strength of the work when put together. We ought to add another—beauty of form. Bent carriage shafts are almost, if not entirely, used now instead of the old-fashioned, clumsy sawed ones.

It is a business that needs to be well understood, however, to make a success of it. Simply the forms to bend on and the steam box to soften the wood in do not make a success in wood-bending. We must know perfectly the stock to be bent, for stock is so variable that no two pieces bend alike. The length of time to be steamed, also, has much to do with the success in bending. Heavy work needs special care to make it come out in fine shape. The selection of stock, also, must be closely attended to.

Simple as the work seems to be, yet it is full of little details which must be strictly attended to, else the result is a miserable failure. The small number of places where wood is bent as a business makes it an industry in which there is little competition, and if it is well understood and the necessary details strictly attended to, it will make good returns for money invested.—*Woodworker.*

The Sash and Door Trade.—It is probable that the sash and door trade will be immensely developed on the North Pacific Coast during the coming five years. The cedar of that region is admirably adapted to the manufacture of such goods. It is wide, clear and easily worked, but its chief recommendation for sash and doors is its integrity when put in place. It never warps, and shrinks and swells but little. It is now largely used for the home demand, and manufacturers already have their minds set on extending their markets so as to reach remoter parts of the country. There is no reason why their anticipations should not be realized. Sash and doors are mill products that can be shipped long distances at a profit, and an energetic pushing would place North Pacific factory output in any part of the country.—*Northwestern Lumberman.*

Black Birch for Inside Finish.—Black birch for doors, wainscoting and other interior work is being introduced to a considerable extent in new buildings, and it is certainly one of the handsomest of the many varieties of woods that are being introduced into new houses in the Eastern States, while the cost is much less. Black birch is a close-grained wood and is as easy to work as walnut, and is much cheaper than either walnut or cherry. There is great difference in the quality and color of birch, that growing upon high and dry land being hard and susceptible of good polish, while the growth on swampy land is soft, and therefore not well suited for the purposes the upland product so admirably fills. The writer in constructing a new house last year had birch folding doors introduced against the protest of his architect, who had never heard of birch wood being used for that or any analogous purpose. The result is most satisfactory to all parties, and to none of us more than the architect, who preferred the use of walnut or cherry. Possibly the builder took especial care in the selection of his material, so as to convince the architect of his error, and his (the builder's) superior knowledge; but, however that may be, the black birch doors, which in texture resemble satin wood and in color dark cherry, are the admiration of every one who has seen them. Birch grows in our northern latitude and the trees attain considerable hight and size in localities, and there is a species of bird's-eye birch which is well calculated for furniture. It resembles bird's-eye maple, and when polished it possesses that sheen which renders satin wood so pleasing to the eye. We predict for black birch an important place among the fancy woods for house finishing and furniture. —*Ex.*

Our Furniture.—American furniture, owing to the superior modern design and artistic finish, is fast obtaining a foothold in foreign countries, and American woods, which have very little recognition at home, are coming into prominence in Europe as very desirable both for the manufacture of furniture as well as for interior house finishing. One of the most flourishing, profitable and important branches of American industry is the manufacture of furniture. Not only do our factories supply the needs of 53,000,000 of people, but scarcely a ship sails from our ports without carrying among her cargo specimens of this class of manufactures. The American-made furniture is preferred in several foreign countries for many reasons. The taste of the American artisan is refined and elegant, and the work he turns out is light and symmetrical as well as strong and durable. While the English, French, and German manufacturers still cling to their antiquated fashions and old methods, the Americans are constantly inventing new styles, or improving on the old, and are thus in this branch of industry, as well as in many others, far ahead of their transatlantic rivals. Notwithstanding the excessive and in many cases prohibitive import duties that obtain in a majority of Latin-American countries, furniture of American manufacture is gradually becoming more and more fashionable.—*Woodworker.*

Woods Used in Canes.—No one need complain on the score of variety in the woods used for walking-sticks, says a cotemporary. About everything procurable and at all suitable has been pressed into service. Most of the woods are from foreign climes. Among the conspicuous sorts are the whangee-sticks. They are Chinese products and prized because of the regularity of their joints. The orange and lemon sticks are always more or less fashionable. The orange has a beautiful green bark and odd-looking markings which run the length of the cane. The lemon is rougher, and has prominent knots at regular intervals. Algeria supplies us with myrtle-sticks, which are carried by those who admire odd effects. Other imported sticks are ebony, palmetto, rosewood, thorn, cactus, hairwood, partridge and lots of other woods whose names are already well known and need not be repeated here. A peculiar stick we get from a species of palm grown in Borneo, and is called rajah; but the most celebrated of all palm canes is malacca. It comes from a species of calamus, a slender-growing palm. The strangest part of it all is that it does not hail from Malacca, but from a small place on the opposite coast of Sumatra. We do not know why it is called malacca.

To Ebonize Mahogany, apply acetate of iron, French stain, with a brush before polishing, when it will be seen that it strikes well into the wood and takes a fine finish. Unless a large quantity of the stain is required it is cheaper to purchase it. Several good recipes for its preparation are to be had in the books.

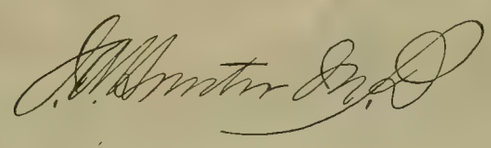
Dr. James A. Hunter.

THE Scientific Press presents this week to its readers an excellent portrait of Dr. James A. Hunter, the eminent specialist in throat and chest diseases, one of the representative medical men of the world. Dr. Hunter is a British subject, but long residence and intimate association with French and Americans has obliterated many of the distinctive characteristics of his nationality. In other words, he is a thorough cosmopolitan. He is a gentleman of courteous and pleasing manners, but positive and decisive in tone, about 45 years of age, well preserved, and looking even younger, and his visage and physique clearly indicate that he has lived a temperate and intellectual life.

Early in his professional life Dr. Hunter became impressed with the great prevalence and fatality of diseases of the lungs, and the inadequacy of the usual means employed by the profession in combating them. He thought he saw in the various processes of the inhalation of remedies, greater possibilities of benefiting and curing this class of invalids, and turned his attention especially to this method of therapeutics. He has closely devoted all the years of his active professional life to working out problems of more successful treatment of ailments of the organs of respiration, and achieved such success and reputation as place him not only in the front ranks of the pulmonary specialists, but far ahead of most of his competitors.

But while he has been cultivating and practicing his chosen specialty with so much assiduity and zeal, he has not ignored the study, at least, of general medicine and surgery. We have been permitted to copy the numerous diplomas conferred upon him by some of the foremost medical educational institutions of the world. They show that while he is best known to the world as a specialist in pulmonary, catarrhal and aural diseases, and to many only as such, he is a man of thorough and profound information in all branches of medical science and surgical art.





Translations and Copies of some of Dr. J. A. Hunter's Diplomas and Certificates of Professional Qualification.

ROYAL COLLEGE OF SURGEONS, EDINBURGH.

[*Translated from the Latin.*]

By these presents, do we testify that the skillful practitioner, JAMES ALBERT HUNTER, after a thorough course of the studies prescribed in our Curriculum, has undergone an examination and so answered the questions proposed, as to show that he is fully qualified to perform the duties required of him in SURGERY AND PHARMACY.

Given at EDINBURGH, on the sixth day of April, one thousand eight hundred and eighty-three.

WM. TURNER, President.
JAS. D. GILLESPIE,
T. D. LITTLEJOHN,
JOSEPH BELL,
JOHN DUNCAN,
JOHN SMITH,
DAVID WILSON,
SEAL ALEXANDER GORDON MILLER,
PATRICK HERRON WATSON,
ROBERT CUNYNGHAM,
PETER MACLAREN,
JOHNSON SYMINGTON,
ROBERT MACNAIR.

SURGEONS' HALL, EDINBURGH, April 6, 1883.

IT IS HEREBY CERTIFIED that JAMES ALBERT HUNTER, who this day received the diploma of the Royal College of Surgeons of Edinburgh, was duly examined in Midwifery, and found competent to practice it. WM. TURNER, President.

R. M. CUNYNGHAM, *Senior Examiner.*

ROYAL COLLEGE OF PHYSICIANS, EDINBURGH.

[*Translated from the Latin.*]

At the earnest request of the Honorable President and Members of the aforesaid College, we declare to whomsoever these presents may concern, the skillful physician, JAMES ALBERT HUNTER, to be hereafter ranked among the number of licentiates of this institution, and to justly claim a right to the privileges which such a degree entails.

In faith of which his Honor, the President, and his Secretaries of the above-named College, have issued, under their seal, this Medical Diploma.

Given at Edinburgh, at a meeting of the members, on the sixth day of April, in the year of our Lord eighteen hundred and eighty-three.

[SEAL] GEORGE WILLIAM BALFOUR, *Pres.*
JOHN WYLLIE, *Sec'y.*

ROYAL COLLEGE OF PHYSICIANS, EDINBURGH.

It is hereby certified, Edinburgh, April 6, 1883, that JAMES ALBERT HUNTER has been duly examined in Midwifery, and found competent to practice it.

GEORGE BALFOUR, *Pres.*
JOHN WYLLIE, *Sec'y.*

UNIVERSITY OF BRUSSELS, BELGIUM.

[*Translated from the French.*]

FACULTY OF MEDICINE.—The medical Faculty of the University of Brussels declares that JAMES ALBERT HUNTER has sustained before them, in a satisfactory manner, the trials (examinations) prescribed by the regulations of the University, and accordingly he has been proclaimed Doctor of Medicine, Surgery and Obstetrics.

This diploma will entitle him to the enjoyment of the rights conferred by regulation and custom.

BRUSSELS, June 16, 1883.

The Professors of the faculty of Medicine:
DR. THIRY,
DR. J. CROCQ,
DR. GUILLERY,
DR. PIGEOLET,
DR. JOS. DESMETH,
SEAL DR. TH. HAUBEN,
DR. DE ROUBAIX,
DR. WEHENKEL,
DR. TIRFAHEY,
DR. H. DESMETH,
DR. KUFFERATH.

The Rector, E. YSEUX.
Administrator Inspector,
JH. VAN SCHOOR.
SEAL Secretary of the University,
LOUIS DENNIS.
Signature of Holder of Diploma,
DR. J. A. HUNTER.

ENDORSATION OF THE BELGIAN MINISTER.

CONSULATE OF BELGIUM, in New Orleans, La.

I am authorized by his Excellency, the Minister of Belgium to the United States, at Washington, D. C., to certify that the Degree of Doctor of Medicine and Surgery conferred upon James Albert Hunter, by the University of Brussels, entitles the said James Albert Hunter to practice Medicine and Surgery in all Belgium, and that the said University of Brussels is the highest scientific credit and standing in the Kingdom of Belgium, and all of its diplomas are of equally good repute.

Given under my hand and seal this fifth day of December, 1883. A. J. R. LANDAUER,
Consul de Belgique.

FROM THE U. C. MEDICAL BOARD.

Toronto, January 7, 1865.

At a meeting of the Medical Board, held this day, MR. JAMES ALBERT HUNTER appeared, and having been examined touching his qualifications to practice Physic, Surgery and Midwifery, the Board find him fully qualified to practice these several branches, and grant him their certificate accordingly.

EDWARD M. HODDER, M. D.,
F. R. C. S. [L. S.] President of Board.
JAMES THORBURN, M. D. EDIN. [L. S.]
JAMES ROSS, M. D., [L. S.]
JAMES ROWELL, M. D., [L. S.]
UZZIEL ODGEN, M. D., [L. S.]
H. H. WRIGHT, M. D., [L. S.]

Certified true copy.
EDWARD SANGEVIN,
Under Sec'y of State, Canada.

STATE DIPLOMA, CANADA.

To all to whom these presents shall come, or whom the same may concern— {SEAL.}

GREETING:

WHEREAS, pursuant to the fortieth chapter of "The Consolidated Statutes for Upper Canada," entitled "An Act Respecting the Medical Board and Medical Practitioners," JAMES ALBERT HUNTER hath been examined by the Medical Board in and for Upper Canada, and hath been found duly qualified to practice Physics, Surgery and Midwifery, as appears by the certificate of six members thereof bearing date the seventh day of January, in the year of our Lord one thousand eight hundred and sixty-five:

Now know ye, that reposing confidence in the loyalty, integrity and good morals of him, the said JAMES ALBERT HUNTER, I do hereby, in virtue of the power and authority in me vested by the said Act, license and authorize him, the said JAMES ALBERT HUNTER, to practice Physics, Surgery and Midwifery within that part of the Province of Canada called Upper Canada.

Given under my hand and seal at arms, at Quebec, in the said Province, this eighth day of April, in the year of our Lord, one thousand eight hundred and sixty-five, and in the twenty-eighth year of Her Majesty's Reign.

MONCK, *Governor General.*

By command: A. MEREDITH, *Assistant Secretary.*

Recorded, April 12, 1865, Lib. I. K., Fol. 293.
GEO. H. S. —— (Illegible), *Deputy Registrar.*

COLLEGE OF PHYSICIANS AND SURGEONS.
ONTARIO, CANADA.

Be it known to all men, that James Albert Hunter, having given proof that he has complied with all the requirements of the Ontario Medical Act, has been duly registered as a member of the College of Physicians and Surgeons of Ontario.

In testimony whereof we have hereunto affixed our signatures and the seal of the said College, this eleventh day of November, in the year of our Lord MDCCCLXXX.

W. ALLISON, *President.*
D. BERGIN, *Vice-President.*
ROBERT ALLEN PYNE, *Registrar.*

QUEEN CHARLOTTE'S HOSPITAL.

PATRON—HER MAJESTY, THE QUEEN.

These are to certify that James Albert Hunter, M. D., M. C. P. S., O., has attended twenty cases of labor in Queen Charlotte's Lying-in Hospital to my satisfaction.

WM. CHAPMAN GRIGG, M. D., *Physician.*

Dr. Hunter's Return to San Francisco.

Dr. Hunter lived in this State from 1876 to 1880, and conducted such a large practice that his health failed and he was compelled to seek relaxation. Going to Europe in the latter year, he made a tour of the leading hospitals of Great Britain, France and Belgium, and ultimately settled down to steady, regular work in St. Thomas's Hospital, London, one of the largest and finest in the world. Here he made most of his preparation for the examinations of the Royal Colleges of Physicians and Surgeons, Edinburgh, and the University of Brussels, Belgium.

Returning to this country in the fall of 1883, he decided to go to New Orleans for the benefit of its mild climate, as his professional work in Europe had prevented him from entirely recovering his natural vigor. In the Crescent City he soon become famous in his specialty. It was always his intention to return to California, but not until now did he feel that he could tear himself away from a community in which he had found so much of social pleasure and professional success.

It is a satisfaction to know that the advantages of Dr. Hunter's skill and experience have not been lost to the people of this coast, and we are pleased to learn that he has been welcomed here most cordially by his hosts of old friends and patients, and that he is likely to make his home here.

Dr. Hunter has resumed the practice of his specialty—throat, chest, nasal and aural diseases—at 324 Sutter Street, nearly opposite his former residence, where he has fitted up a most complete office for the administration of Oxygen and medicated Inhalations, which he has found so valuable in this class of ailments.

A TESTIMONIAL

—FROM—

Nearly One Hundred of Dr. Hunter's Patients, Including Some of the Most Eminent Citizens of New Orleans and Vicinity.

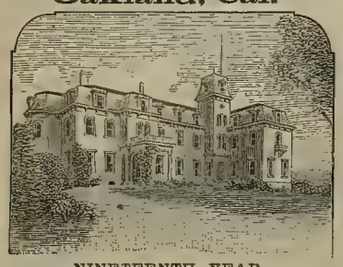
NEW ORLEANS, LA., December 24, 1883.

We, the undersigned, having *personal* knowledge of Dr. James A. Hunter's many and eminent qualifications in his profession, his character as a gentleman, his long experience and skill in his specialty, and the great merits and success of his methods of treating diseases of the Throat and Lungs by INHALATION, recommend him to those suffering from ailments of these parts, satisfied that he possesses superior skill in their treatment.

HUGH McCLOSKEY, President of the Produce Exchange.
JAMES JACKSON, late President of the New Orleans Gaslight Co.
JOS. HERNANDEZ, Capitalist; President of the Jefferson City Gaslight Co.
L. EMILE LEMARIE, formerly a member of the City Council; Vice-President of the Municipal Gaslight Co., New Orleans.
COL. I. W. PATTON, late Mayor of New Orleans; Treasurer of the City of New Orleans, City Hall.
CAPT. WM. BAYLEY, late U. S. Consul Bonaca, Honduras.
JUDGE J. HARVEY BRIGHAM, Judge Sixth Judicial District, Bastrop, La.
REV. DR. HARVEY F. JOHNSON, President of Whitworth Female College, Brookhaven, Miss.
C. H. HOSMER, late Mayor of Summit, Miss.
P. LANE, Esq., Supt. of the State Asylum for the Blind Baton Rouge, La.
DR. D. L. RAWLES, Terry, Hinds County, Miss.
HON. WASHINGTON MARKS, Produce Exchange, New Orleans, La.
O. M. TENNISON, Chairman State Dem. Committee, Civil District Court, La.
REV. OWEN RIEDY, Pastor of Immanuel Presbyterian Church.
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24 POST ST., S. F.

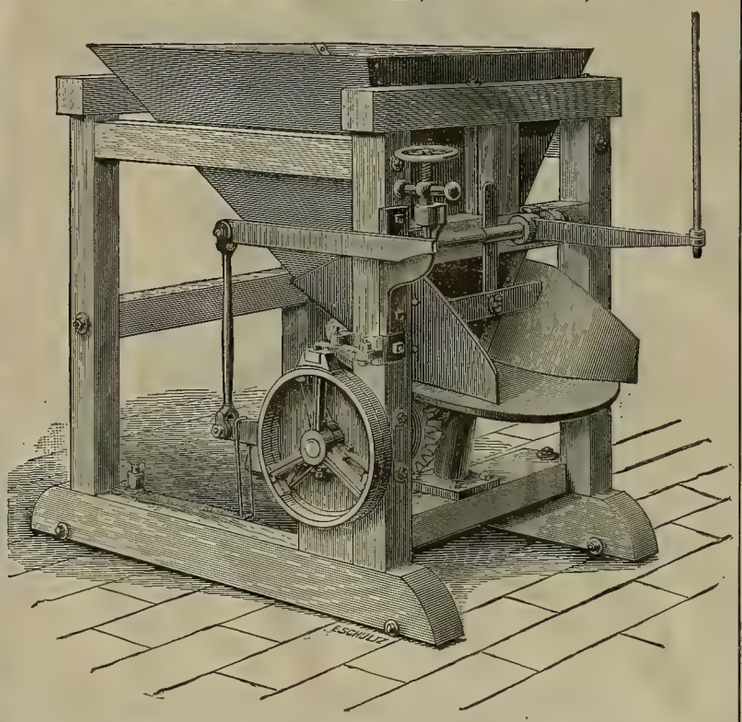
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C. S. HALEY, Secretary.

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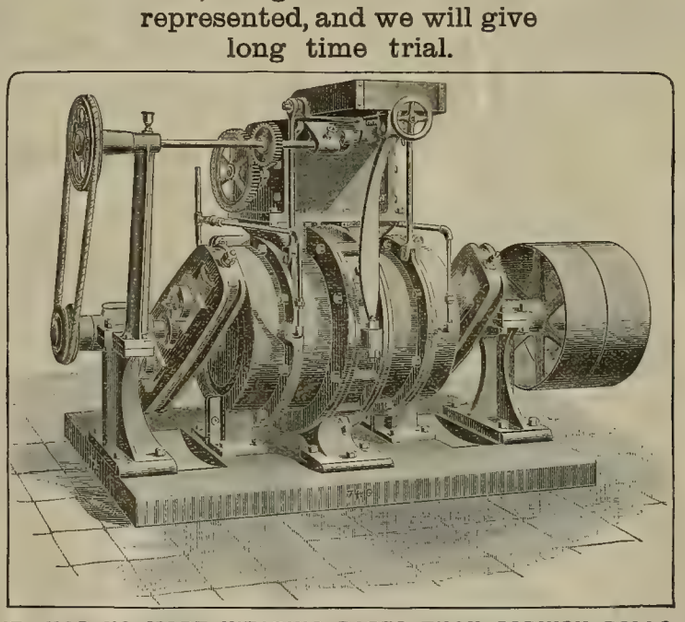
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One 8½x13 ft. Air Receiver.
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D. C. WICKHAM, Taylor Mine, Greenwood, Cal.
J. R. TREGLOAN, Supt. South Spring Hill Gold Mining Co., Amador City, Cal.
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FRISBEE WET MILL.
This Mill, with a weight of less than 9000 pounds, has a capacity of three tons per hour of hard quartz to 40 mesh; has been thoroughly tested; we guarantee its work as represented, and we will give long time trial.



IT HAS NO MORE WEARING PARTS THAN CORNISH ROLLS
And renewals will not cost over one-half as much as for stamps. Will run empty, or with small amount of ore without injury. The attention of parties having Cement Gravel is called to this Mill, as it will run 100 tons per day to No. 8 mesh; 30 to 35 H. P.
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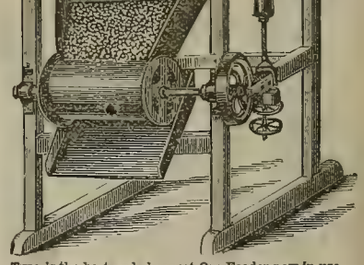
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The **H. H. H. Liniment** is for the treatment of the Aches and Pains of Humanity, as well as for the ailments of the beasts of the fields. Testimonials from importers and breeders of blooded stock prove its wonderful curative properties. No man has ever used it for an ache or pain and been dissatisfied.
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THIS is the best and cheapest Ore Feeder now in use.
It has fewer parts, requires less power, is simpler in adjustment than any other. Feeds coarse ore or soft clay alike uniformly, under one or all the stamps in a battery as required.
In the Bunker Hill Mill it has run continuously for two years, never having been out of order or costing a dollar for repairs.
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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific States.

FOR WEEK ENDING OCT. 8, 1889.

412,454.—COUPLING KEY BOARD FOR ORGANS—C. Blomquist, Pescadero, Cal.

412,321.—CLAY REDUCER—W. Burkman, Los Angeles, Cal.

412,464.—ELECTRIC IGNITING DEVICE FOR LAMPS—Carranza & Tinoco, S. F.

412,381.—LINK ADJUSTER FOR CAR COUPLING—Gilham, Eckert & Gilham, Beowawe, Nevada.

412,705.—FIRE LADDER—H. T. Hayes, Oakland, Cal.

412,390.—TOOL HANDLE—J. S. Jaquith, Sierra City, Cal.

412,638.—AGRICULTURAL MACHINE—G. H. Little, Los Angeles, Cal.

412,712.—BOOK-STAPLING MACHINE—Jos. Lyman, San Jose, Cal.

412,407.—DISTILLING APPARATUS—P. Napoles, Napa, Cal.

412,434.—CONCENTRATOR—Jas. Tullock, Angels Camp, Cal.

412,577.—KNITTED UNDERSHIRT—F. Wilcomb, S. F.

10,342.—DESIGN—F. S. Butler, S. F.

The following brief list by telegraph, for Oct. 15th, will appear more complete on receipt of mail advices:

California—George H. Wright, San Francisco, signal device for cable railway crossings; Erlich Schmidt, Marysville, weed-cutter; Michael S. Roderique, San Francisco, elastic socket for pen-holder; Edwin B. Mastick, Alameda, automatic sewer-flu hing tank; John Knight, San Francisco, adjustable cone center for lathes; Joseph Kaiser, San Francisco, necktie frame; Randall Hunt, San Francisco, fastening foundations of structures to piles or other materials; George W. Haines, Stockton, header and thrasher; James B. Freeman, Los Angeles, ore separator; Frank S. Fox, San Francisco, car-coupling; R. M. Edwards, San Francisco, fender-guard attached to cars.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable prices, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

TOOL-HANDLE.—Jonathan S. Jaquith of Sierra City, Cal. No. 412,390. Dated Oct. 8, 1889. This invention has relation to that class of tool-handles or stocks in which the outer or blow-receiving end is provided with a cushion, both for the protection of the handle or stock and the avoidance of injury to the mallet. The novelty of this invention lies in the peculiar construction and arrangement of the cushion, and consists essentially in fitting a threaded band to the handle, screwing a hollow nut upon said band, in the outer end of which is carried the cushion block, and placing between the inner end of the cushion block and the end of the handle a bearing plate. The end of the cushion block projects beyond the end of the nut and receives the blow.

LINK-ADJUSTER FOR CAR-COUPLINGS.—Thos. H. Gilham, William C. Eckert, and Leroy Gilham, all of Beowawe, Nevada. No. 412,381. Dated Oct. 8, 1889. This link-adjuster, as its name implies, is for the purpose of accurately moving and adjusting the coupling link so that it will readily enter into the opposing drawhead. It consists of a swinging piece or block, having a central bed or plane surface for holding and guiding the link, and upwardly flaring side flanges for centrally adjusting it, this block being carried by an arm on a rock shaft under the car end, and operated from either side of the car, as may be desired. By rocking the shaft, the adjusting block is brought up under the link, and by reason of its peculiar construction, the link is accurately moved and adjusted to the central perpendicular plane, no matter in what position it may be lying on each side of said plane, and it is lifted to and held in the proper plane or position, whereby it is guided accurately into the opposing draw-head.

ORE CONCENTRATOR.—James Tullock of Angel's Camp, California. No. 412,434. Dated Oct. 8, 1889. This concentrator belongs to what is known as the class of endless belt concentrators. Its novelty rests in the mounting of the frame, the means for imparting a laterally rocking motion to it, and the belt which it carries, and the means for imparting to said belt what is known as its up-hill travel. The belt frame is mounted upon rockers, like those of a cradle, and a crank-shaft at one side is connected with it by a rod or link, whereby as the shaft is rotated, the table is vibrated on its rockers. The up-hill travel of the belt is a periodical one, instead of being continuous, as is usually the case, and is obtained by a pawl and ratchet mechanism and intervening gearing deriving its power from the rocking movement of the frame.

COUPLING KEY-BOARD FOR ORGANS.—Carl Blomquist of Pescadero, California. No. 412,454. Dated Oct. 8, 1889. The object of this invention is to do away with the usual footkeys of an organ by providing a simple, convenient and effective means for coupling the keys of the main key-board in octaves by hand, whereby when notes are joined, the keys of which are separated by a distance too great to span, the proper keys may be operated conveniently by means of the supplementary key-board of the coupling device. The coupling mechanism consists of a supplementary key-board adapted to be attached to the organ face above a portion of the main key-board, the keys of the supplementary board being attached each to an axially movable tube, said tubes being arranged in concentric series, and each tube having connected with it an arm or lever, which lies over and is adapted to move down into contact with the key of the main key-board which lies under it, whereby said key-board is operated.

Assessment Notices.

Lapanta Consolidated Mining Company.

Location of principal place of business, San Francisco, California. Location of Works, Hawthorne Mg. Dist., Esmeralda Co., Nevada.

NOTICE is hereby given that, at a meeting of the Board of Directors, held on the 2d day of October, 1889, an Assessment, No. 2, of Two Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin, to the Secretary, at the office of the Company, Room 56, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 8th day of November, 1889, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the 2d day of December, 1889, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

J. STADTFELD, JR., Secretary.

Office, Room 56, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

Gray Eagle Mining Company, Location and principal place of business, San Francisco, California. Location of Works, Placer Co., Cal.

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 16th day of October, 1889, an Assessment, No. 15, of Six (6) Cents per share was levied upon the Capital Stock of the Corporation, payable immediately, in United States Gold Coin, to the Secretary, at the office of the Company, Room 11, No. 303 California St., San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 18th day of November, 1889, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Tuesday, the 10th day of December, 1889, to pay the delinquent assessment, together with the cost of advertising and expenses of sale.

By order of the Board of Directors.

J. M. BUFFINGTON, Secretary.

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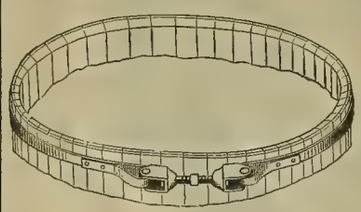
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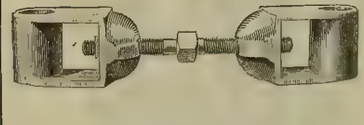
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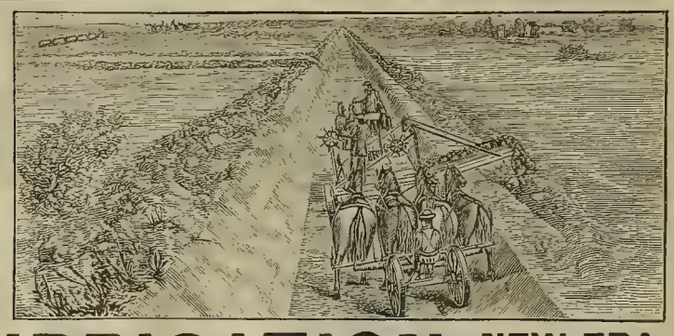
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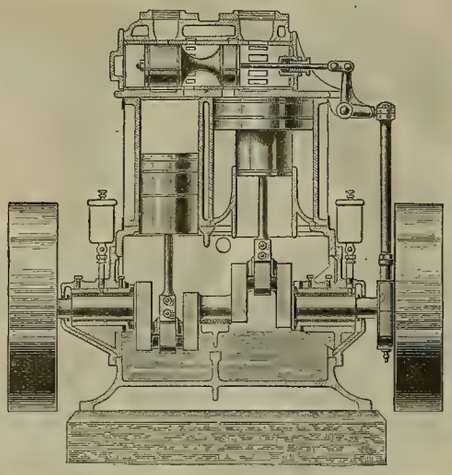
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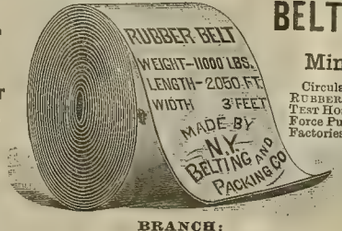
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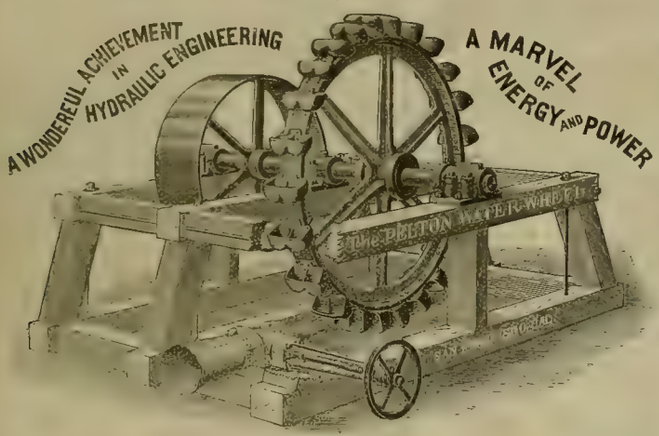
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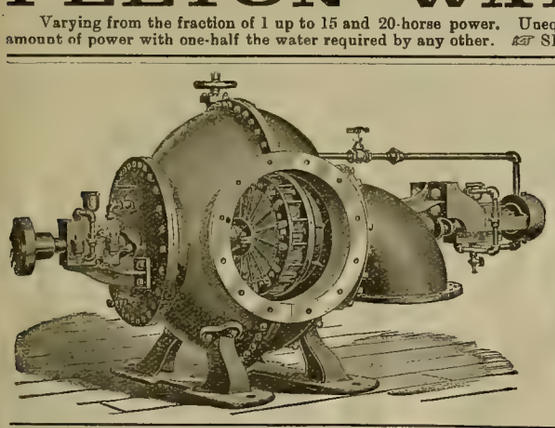
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Oct. 17, 1889.

With rainy weather during the week at different parts of the coast, with a general rainstorm reported at this writing, there is a more hopeful feeling regarding outlook for a good trade, Iron-workers and machine men in general express themselves very confident of the future. Their faith is grounded on every prospect that we will have a wet winter, something we have not had for all of three years, and with an abundance of water all mining industries will be revived throughout the coast. The local money market is reported easy; remittances are coming in more freely, while the call for funds to send East is less pronounced by reason of the growing ease in the English money market, and consequently more ease in New York. Speculation with us is lifeless, but present appearances indicate a revival at an early day.

MEXICAN DOLLARS—The demand for shipment by the steamer leaving to-day for China has been quite active, keeping the market strong at 75¾ to 76 cents.

SILVER—The European market advanced the past week to 43d and the New York market to 93⅝ cts., while in our market 94¾ to 94⅞ cts. was the range, with a sale made as high as 95 cts. to fill a special urgent order. At the close to day the London market is quoted at 42⅞d and New York 93¾ cents. With us there is a continued scarcity of bullion, notwithstanding fair receipts from Omaha, which compels buyers to bid well above the European parity to have their wants met. The present rains ought to start up the mills on the Carson river, Nevada, and increase, to some extent at any rate, our silver supply from that source, although the ore to be milled is said to contain a larger percentage of gold than heretofore milled.

QUICKSILVER—Receipts the past week aggregate 463 flasks, and the exports 305 flasks to Mexico. The market is quiet but steady, An improved demand is expected to set in owing to more water for mining purposes.

LIME—Receipts the past week were light, only aggregating about 2993 bbls. The demand is falling off, but the price is unchanged.

BORAX—The exports the past week aggregate 65,010 lbs. to New York and 100 lbs. to Mexico. The market is strong, with a continued good demand ruling from the East.

TIN—Exports the past week aggregate only 1075 lbs plate to Nanaimo. The market is dull but strong. It is claimed that when buyers enter the market again they will have to pay an advance after two or three consignments are cleaned up. The European market is strong, with the pool standing under it.

ANTIMONY—The market is very strong. New York mail advices report supplies light. It is stated that smelting-works are to be built in this State to turn out antimony, which can be mined with a profit for less money than now quoted.

LEAD—The market is without essential change. As usual, with the approach of the rainy season, the demand is not so pronounced, while the canners are not in the market and not likely to be under two months to come.

COPPER—The market shows a fair degree of firmness. The consumption in this country is said to have increased most wonderfully so far in this year, yet it is the policy of mine-owners and others in interest not to advance prices so as not to in any way restrict the consumption.

COAL—Imports the past week aggregate as follows: From Nanaimo, 4225 tons; Seattle, 4068; Tacoma, 1660; Australia, 5383; Departure bay, 5312; Comox, 4000; Coos bay, 1500; total, 26,148 tons. The market is very strong under a continued free consumptive demand. Coast coals for household purposes are coming in more freely, but it is claimed that all received goes into consumers' hands about as soon as it comes to hand.

The coast collieries' output is slightly increased. From Australia the tonnage on the way to and to load for this port is as follows: New castle, N. S. W., 40,806 tons register and Sydney 16,348 tons register. Total, 57,154 tons register, with a carrying capacity of about 82,000 tons. As the tonnage in Australia is scarce and asking high charters, the prospects for a decided increase for this port is at present poor.

IRON—Imports the past week were only 40 tons of pig from Portland, Oregon. The market for merchantable bar is higher, in sympathy with better prices at the East. Pig is very strong, with a fairly free consumption reported. The European and Eastern markets were at last mail advices still tending up.

The following are the latest comparative quotations f. o. b. at Glasgow:

	Oct. 10, '89.	Oct. 4, '89.
No. 1 Coltness	70s 6d	67s 6d
" Langloan	69s 0d	66s 6d
" Summerlee	68s 6d	66s
" Gartsherrie	67s 6d	65s
At Ardrossa.		
No. 1 Eglinton	56s 0d	53s
" Glengarnock	65s 0d	60s 6d
" Dalmellington	57s 6d	53s

Eastern Metal Markets.

By Telegraph.

NEW YORK, Oct. 17, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	42⅞	93¾	$10 75	$3 92½	$21 00
Friday	42⅞	93¾	10 85	3 92½	20 70
Saturday	42⅞	93¾	10 80	3 92½	20 50
Monday	42 15-16	93⅞	10 85	3 90	20 65
Tuesday	43	93⅞	10 90	3 90	20 80
Wednesday	43	93⅞	10 95	3 85	20 90

NEW YORK, Oct. 16.—Borax is firm and wanted. Quicksilver, 68@69c; steady. The copper trade is light. Lake Ingot steady, 11c; casting brands, 9¾ @10¾c. A free offering at latter price. A small regular business in Pig lead at $3.85@3.90 at the close.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, October 17, 1889.

ANTIMONY	19 @ 20
BORAX—Refined, in carload lots	7½@ 7⅝
Powdered " " "	7½@ —
Concentrated " " "	— @ 6¾
All grades jobbing at an advance.	
COPPER—	
Bolt	21 @ 22
Sheathing	22 @ 24
Ingot, jobbing	15 @ 16
do, wholesale	13 @ 14
Fire Box Sheets	22 @ 24
LEAD—Pig	4½@ —
Bar	5 @ —
Sheet	7 @ —
Pipe	6 @ —
Shot, discount 10% on 500 bags Drop, ₱ bag.	1 45 @ —
Buck, ₱ bag	1 65 @ —
Chilled, do	1 85 @ —
STEEL—English, lb	16 @ 20
Canton tool	9 @ 9½
Black Diamond tool	9 @ 9½
Pick and Hammer	8 @ 10
Machinery	4 @ 5
Toe Calk	4½@ —
TINPLATE—B. Y. steel grade, 14x20, P. S.	4 85 @ —
B. Y., steel grade, 14x20, spot	4 85 @ 4 90
Charcoal, 14x20	6 25 @ 6 75
do roofing, 14x20	5 12½@ 5 25
Pig tin, spot, ₱ lb	21 @ 21½
COKE—Eng., ton, spot, in blk & sks, resptvly	17 00 @20 00
Do, do, to load	13 50 @14 50
QUICKSILVER—By the flask	— @47 50
Flasks, new	— @ —
Flasks, old	35 @ —
CHROME IRON ORE, ₱ ton	10 00@ —

IRON—Glengarnock ton	Spot. 30 00 @— —	To Load. 29 @ —
Eglinton, ton	29 00 @— —	29 @ —
American Soft, No. 1, ton	— @31 00	31½@ —
Oregon Pig, ton	— @30 00	— @ —
Clay Lane White	— @ 25 00	25 @ —
Shotts, No. 1	30 00 @30 00	— @ —
Bar Iron (base price) ₱ lb	2½@ 3	— @ —
Langloan	30 00 @— —	30 @ —
Thorncliffe	30 00 @— —	30 @ —
Gartsherrie	30 00 @— —	30 @ —

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	7 75 @ 8 00	Cardiff	9 50@10 00
Liverpool St'm	8 50 @— —	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	9 00 @ 9 00	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Gilman	7 00
Scotch Splint	9 00	Seattle	7 00
Greta	9 00	Coos Bay	5 50
Westminster Brymbo	9 00	Cannel	11 00
Nanaimo	9 00	Egg, hard	18 00
Sydney	8 00	Cumberland, in sacks	19 00
Jackson	6 00	do, bulk	18 00

Mining Share Market.

The mining share market the past week was decidedly mixed—some stocks advancing, some going down, and others flopping around like a fish out of water. The Alta group had quite a setback, closing barely steady. The other Comstocks set back under a bear raid on Con. Virginia, which caused many holders to let go of their stocks, but with that stock steadying up the general line strengthened, yet the public are skeptical about much of an improvement soon. The large majority look for lower prices soon. The bulls think the market ought to rally some, owing to the Sutro Tunnel and Con. Virginia scare being over, and about all the necessary assessments have been levied. In outside stocks, trading has been more active, under the leadership of Eureka Con. This stock has been made quite lively, bobbing up and down at a lively rate. The Quijotoas shaded off, but at the close are slightly higher and stronger. The Tuscaroras have a very strong undertone, as if the manipulators are preparing for a deal. The Bodies, like a whipped dog's tail, lagged, although Bodie made a slight upward move yesterday (Wednesday), only to fall back again at the close. The pending assessments on Bodie and Mono are at present a drawback to these stocks.

From the mines we give under "Mining Summary," late official letters from all the Comstock and Bodie mines. The letter from Crown Point is not only quite interesting but important, as are those from Hale and Norcross and Savage. The official announcement that the Gold Hill group of mines is to be pumped out down to the 2800-foot level is the most important information lately given out. The managers of the Gold Hill mines, it is said, will drain their mines through the Belcher shaft and also the Yellow Jacket shaft. In sinking the Yellow Jacket shaft it is affirmed by experienced miners that below the 2700-foot level very rich ore was struck. Its extent and richness was kept secret, when the shaft, for reasons best known to the three managers, was abandoned. The Belcher shaft was sunk to the 2800-foot level and a north drift started which struck a very rich body of ore. From the 2700-foot, or thereabout, level a north drift was started to skirt the ore lode. This was run into Alpha and some say into Exchequer, when a body of hot water was struck which flooded all the Gold Hill mines, compelling them to abandon the lower levels. But since then Crown Point and Belcher, and also Yellow Jacket, have been connected with the Sutro Tunnel, while the Ward shaft is to be connected with the tunnel at an early day. With these connections, the mines can be speedily drained and work resumed on the lower levels of the mines drained. In running the north drift from the 2700-foot level of Belcher, the drill was used at intervals its entire length up to and in Alpha, and those in position to know, affirm that high-grade ore was drilled into as well as hot water tapped. From the outside districts, good news comes from the Quijotoas. The Peerless mill was to have started up yesterday on Crocker ore. From the Tuscaroras, we are advised that the Commonwealth and Grand Prize concentrators will be ready to start up some time in next week. From the Bodies, our advices are unimportant.

TO RECONVENE THE TRIAL BOARD.—Secretary Tracy has approved the recommendation of Chief Engineer Melville and Chief Constructor Wilson, that Commodore Benham be instructed to reconvene the board on the trial trip of the Charleston to prepare a new report of the trip. The board is then requested to report simply on the trial of the Charleston, whether or not the plans and specifications of the contract have been carried out, and whether the vessel should be accepted. They are also requested to confine themselves to the trial and not to make new suggestions as to changes.

Mining Personals.

Wheeler & Booth of Sacramento own the Arizona mine at Unionville.

Superintendent Dennis of the Mountaineer mine, Nevada City, is visiting at San Jose.

President Warner Van Orden of the Plymouth Consolidated has returned from a visit to Europe.

Max Greenberg, president of the Bituminous Rock Company of San Luis Obispo, is visiting in this city.

Jas. Sutherland, who recently resigned his position as superintendent of the Niagara mine, is stopping in Shasta.

D. B. Lyman, superintendent of Con. Cal. and Virginia and other Comstock mines, left for Virginia City on Oct. 17th.

Richard Troeger, superintendent of the Bonanza group of mines, near Hillsboro, New Mexico, has returned from California.

Ex-Governor Perkins, Millen Griffith and A. Hasley, the purchasers of the New Albany mine, have returned from a visit to the mine.

In Montana Comstock miners are preferred to those from any other locality. It is estimated that 4000 Nevadans are employed in the mines there.

The *Silver State*, Winnemucca, Nevada, says: Superintendent Wheeler of the Arizona mine in Unionville left Friday on a brief business visit to California.

Charles Stocks, for a long time foreman in the Empire and North Star mines, has been appointed superintendent of the Pittsburg mine, Grass Valley.

The Homer *Index* says: Superintendents Capt. John Kelly and A. Pettibone are both in San Francisco, presumably for the purpose of engineering a deal in Bodie stocks.

Archie Farrington, the well-known mining man and superintendent of the Reno Reduction Works, has been examining the Humboldt Queen mine, near Rye Patch, with a view to purchasing the same.

The Sonora *Democrat* says: Mr. A. E. Davis of San Francisco, one of the owners of the Buchanan mine, arrived in Sonora on Wednesday on his way to the mine. He is accompanied by Mr. Keith of the Keith Electric Motor Co. Arrangements are now being made to put an electric plant on the mine in place of the steam-power now used. The results will be watched with much interest by the mine-owners of this section.

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Alice, Oct. 5, $25,728; 5, Butte and Boston, $22,896; Hanauer, 3, $3100; 14, $2550; 5, $2525; 7, $3100; Justice, 15, $3866; Alta, 15, $30,356.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

DUTCH IMMIGRANTS.—Merced is expecting some hundred families from Holland—represented as industrious and frugal people—to come this winter and make their homes in that county.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Belcher M Co	Nevada	13	50	Oct 17	Nov 20	Dec 11	J Crockett	327 Pine St
Best & Belcher M Co	Nevada	44	25	Sept 11	Oct 15	Nov 6	L Osborn	309 Montgomery St
Central California Oil Co	California	1	50	Sept 6	Nov 1	Nov 18	F L Gorlinski	314 California St
Cadmus M Co	Nevada	—	20	Sept 19	Oct 31	Nov 25	J Craig	204 California St
Chicago M & M Co	California	2	15	Sept 13	Oct 18	Nov 4	W Grant	520 Montgomery St
Crown Point M Co	Nevada	52	50	Sept 18	Oct 21	Nov 11	J Newlands	329 Pine St
Del Norte Gravel M Co	California	2	7	Aug 24	Oct 3	Oct 26	J E Crumm	230 Montgomery St
Grand Prize M Co	Nevada	22	30	Sept 24	Oct 28	Nov 19	R R Grayson	327 Pine St
Golden Prize Con M Co	Nevada	3	25	Sept 21	Oct 26	Nov 16	C D Bennett	330 Pine St
Gould & Curry M Co	Nevada	63	30	Oct 15	Nov 18	Dec 11	A Durbrow	399 Montgomery St
Gray Eagle M Co	California	15	6	Oct 16	Nov 18	Dec 10	J M Buffington	303 California St
Keyes M Co	Nevada	4	30	Aug 27	Oct 1	Oct 21	J H Sayre	328 Montgomery St
Livermore Coal M Co	California	1	50	Sept 18	Oct 19	Nov 6	C H Gilgans	120 Sutter St
Lapanta Con M Co	Nevada	2	02	Oct 2	Nov 3	Dec 2	J Stadtfeldt	309 Montgomery St
Mexican M Co	Alaska	1	25	Oct 11	Nov 11	Dec 2		
Mineral King M & M Co	Arizona	3	10	Aug 22	Sept 24	Oct 21	P H Leonard	419 California St
North Belle Isle M Co	Nevada	16	20	Sept 18	Oct 22	Nov 13	J W Pew	310 Pine St
North Bo. anza M Co	Nevada	9	15	Sept 17	Oct 26	Nov 14	J F Rolling	410 Montgomery St
Oak Con M Co	California	4	7	Sept 5	Oct 19	Nov 20	E J Ryan	320 Montgomery St
Peer M Co	Arizona	8	10	Sept 4	Oct 10	Nov 5	A Waterman	309 Montgomery St
Potosi M Co	Nevada	33	50	Sept 18	Oct 22	Nov 12	C E Elliott	309 Montgomery St
Platt & Gil on G M Co	California	3	4 00	Sept 11	Oct 15	Nov 4	C Herrmann	326 Kearney St
Peerless M Co	Arizona	13	10	Oct 11	Nov 19	Dec 10	A Waterman	309 Montgomery St
Scott Bar M & M Co	California	3	10	Sept 0	Oct 31	H Pink		309 Montgomery St
Silver Hill M Co	Nevada	25	20	Sept 27	Oct 31	Nov 21	D C Bates	309 Montgomery St
Sierra Nevada	Nevada	96	50	Oct 5	Nov 3	Dec 7	E L Parker	309 Montgomery St
Seg Belcher & Mides Co	Nevada	4	25	Oct 7	Nov 4	Dec 8	E A Holmes	309 Montgomery St
Tuscarora Con M Co	Nevada	2	10	Oct 12	Nov 15	Dec 5	J J Scoville	309 Montgomery St
True Con M Co	California	7	2½	Aug 31	Oct 12	Nov 16	J G Bates	434 California St
Union Con M Co	Nevada	39	25	Oct 8	Nov 9	Dec 13	J M Buffington	303 California St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Chicago M & M Co	California	W Grant	502 Montgomery St	Special	Oct 23
Candelaria Con Mexican M Co		C S Givens	221 Market St	Annual	Oct 28
Estaca Con Mexican M Co		C S Givens	221 Market St	Annual	Oct 28
Eureka Con M Co	Nevada	H P Bush	306 Pine St	Annual	Oct 21
Mayflower Gravel M Co	California	J Morizio	328 Montgomery St	Annual	Oct 31
Happy Val Blue Gravel & H M Co		D M Kent	330 Pine St	Annual	Oct 24
Exchequer M Co	Nevada	C E Elliot	309 Montgomery St	Annual	Oct 21

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Champion M Co		T Wetzel	522 Montgomery St	10	Oct 15
Caledonia M Co	Nevada	A S Chemnant	328 Montgomery St	08	Aug 5
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	Sept 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	Aug 25
Idaho M Co	California		Grass Valley	5 00	Oct 7
Mt Diablo M Co	Nevada	R Heath	319 Pine St	30	Oct 2
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Sept 10

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept. 25.		WEEK ENDING Oct. 4.		WEEK ENDING Oct. 11.		WEEK ENDING Oct. 18.	
Alpha	1.30	1.35	1.30	1.35	1.20	1.30	1.05	1.25
Alta	1.90	2.40	2.15	2.35	2.20	2.25	1.85	2.30
Andes	.70	....	.70	.75	....	....	.60	....
Belcher	2.80	2.70	2.70	2.90	2.50	2.70	2.25	2.60
Best & Belcher	3.15	3.45	3.30	3.50	3.20	3.40	3.05	3.35
Bullion	.60	.65	.60	.65	.55	.55	.50	.60
Bodie Con	.60	.85	.70	.80	.70	.85	.65	.80
Benton	....	....	....	....	....	....	3.25	....
Bulwer	.30	....	.30	.30	.30	.30	.25	....
Commonwealth	....	....	3.10	....	3.05	3.30	2.95	3.20
Con. Va. & Cal	6½	6¾	6¾	6¾	6	6½	5¾	6¼
Challenge	2.70	2.95	2.70	2.9	2.75	2.8	2.25	2.65
Chollar	1.90	2.00	1.85	1.90	1.55	1.75	1.55	1.70
Confidence	6.25	....	6¾	7	6¾	6¾	6.25	6.75
Con. Imperial	.40	.45	.40	.45	.40	.45	.35	.45
Caledonia	.26	.28½	.22	....	.20	....	....	....
Crown Point	2.50	2.80	2.50	2.85	2.25	2.55	2.05	2.20
Crocker	.45	.54	.50	.60	.50	.55	.40	.50
Eureka Con	2.40	3.50	3.00	3.25	3.20	5.50	3.20	4.60
Exchequer	.60	....	.50	.60	.50	.55	.50	.55
Grand Prize	.60	....	.70	....	.65	.55	.50	.70
Gould & Curry	1.90	2.00	1.95	2.05	1.90	2.05	1.55	1.90
Hale & Norcross	3.05	3.20	3.00	3.30	2.75	3.05	2.75	3.00
Julia	.25	....	....	....	....	....	.20	....
Justice	1.55	1.90	1.65	1.70	1.55	1.70	1.35	1.55
Kentuck	1.10	1.30	1.25	1.30	1.15	....	1.05	1.15
Lady Wash	.40	....	....	....	....	....	....	....
Mono	.75	.80	.70	.80	.75	.80	.60	.70
Mexican	3.60	3.85	3.75	4.20	3.60	4.00	3.40	3.80
Navajo	.30	....	.30	.35	.35	.40	.30	....
North Belle Isle	.60	.75	.55	.70	.75	.80	.70	.75
New Queen	.60	....	.60	.65	.85	.85	.61	.75
Occidental	1.40	1.50	1.45	1.50	1.40	1.45	1.10	1.30
Ophir	4.40	4.75	4.30	4.95	4.50	4.80	4.05	4.55
Overman	1.10	1.30	1.10	1.30	1.05	1.15	.90	1.15
Potosi	1.25	1.40	1.30	1.45	1.25	1.35	1.10	1.25
Peerless	....	....	.30	.40	.30	.35	.25	.30
Peer	....	....	.10	.10	.22	....	....	....
Savage	2.15	2.25	2.00	2.35	1.75	2.05	1.55	1.75
S. B. & M	1.55	1.75	1.65	1.85	1.35	1.60	1.15	1.40
Sierra Nevada	2.60	2.75	2.60	2.85	2.20	2.60	....	....
Silver Hill	.40	....	.30	.35	.25	....	.15	.20
Scorpion	.30	....	.20	.30	.20	....	.25	....
Union Con	2.95	3.20	3.00	3.35	2.85	3.10	2.80	3.00
Utah	.95	1.05	.95	1.05	.90	.93	.65	.90
Weldon	....	....	....	....	....	....	.20	....
Yellow Jacket	3.00	3.20	3.10	3.40	3.05	3.25	2.90	3.15
....	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY, Oct. 17, 9:30 A. M.

	200	Lady Wash	35c
	270	Mexican	3.60
100	Alta	2.00	100 New York 30c
100	Alpha	1.15	200 Ophir 4 25
100	Belcher	2.3	50 Potosi 1.10
50	B. & Belcher	3 05	100 Savage 1.70
100	Bulwer	30c	150 Scorpion 25c
100	Chollar	1.6	200 S. B. & M 1.15
200	Crown Point	2 15	50 Sierra Nevada 1.90
50	Con Va & Cal	5.62½	100 Silver Hill 15c
200	Exchequer	15c	150 Utah 88c
300	Grand Prize	60c	20 Union 2.85
200	Eureka Con	4.25	150 W Comstock 25c
50	Justice	1.40	10 Yellow Jacket 290

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. C. HOAG—San Francisco.
R. G. BAILEY—San Francisco.
M. D. SHRADER—Santa Clara and Santa Cruz cos.
GEO. WILSON—Sacramento Co.
E. H. SCHAEFFLE—Yuba and Sutter Cos.
DR. W. F. DRAKE—Sonora, Cal.
A. F. JEWETT—Tulare Co.
J. H. CROSSMAN—Inyo and San Bernardino Cos.
E. L. RICHARDS—San Diego Co
H. B. PARKER—Tehama and Shasta Cos.
FRANK S. CHAPIN—Sierra and Butte Cos.
JULES BAUMANN—Arizona.
H. G. PARSONS—Central California
WM. H. BILLEARY—Oregon.
W. B. FROST—Montana and Idaho.
JUAN C. JENS—New York City.

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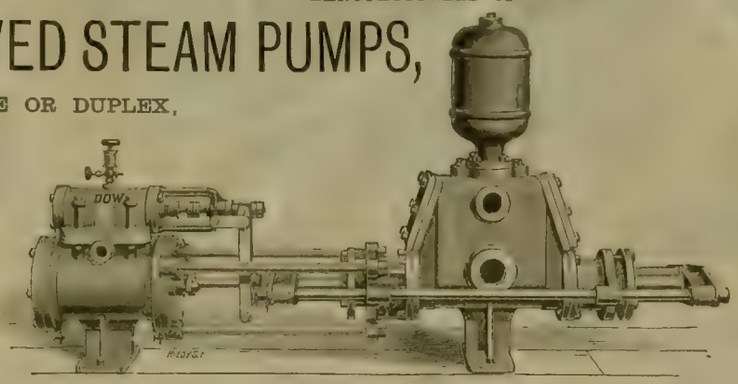
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SPEED GOVERNORS,

Balance Valves and Pressure Regulators,

FOR STEAM PUMPS, ETC., ETC.

CORRESPONDENCE SOLICITED.

SEND FOR CATALOGUE.

The Pittsburgh Boiler Scale Resolvent.

☞This Resolvent IS NOT AN EXPERIMENT but a FACT, and it will do the work claimed for it at a LESS EXPENSE than any other boiler purge, AND IN NO MANNER INJURE THE IRON.

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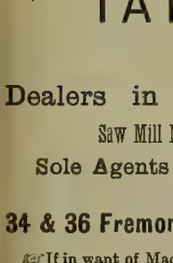
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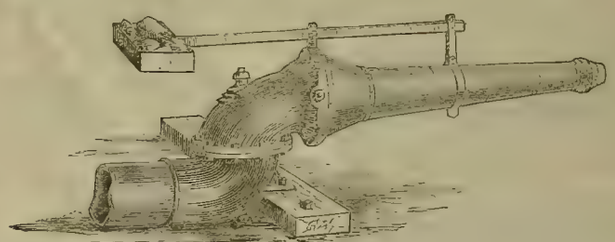
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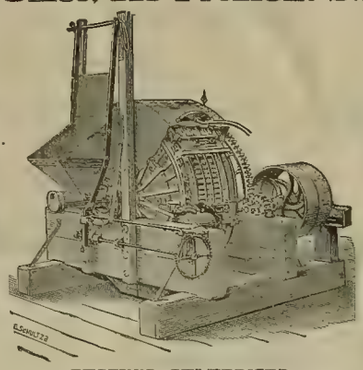
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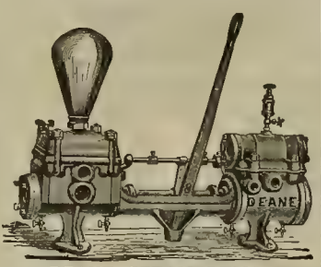
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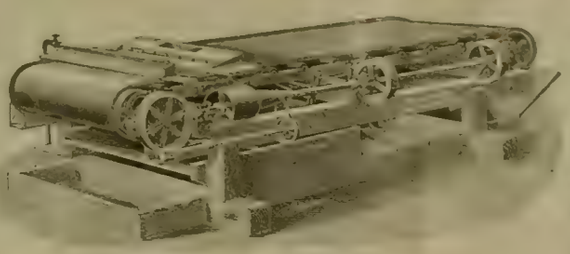
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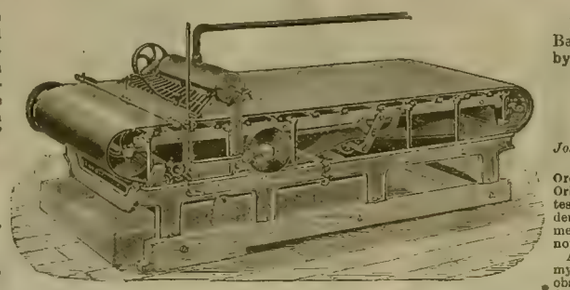
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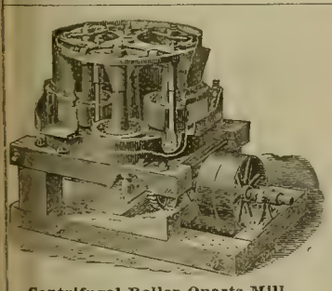
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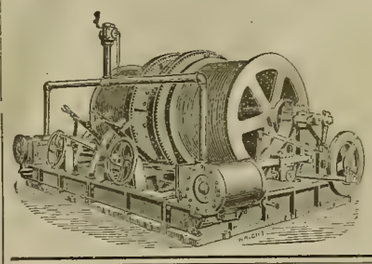
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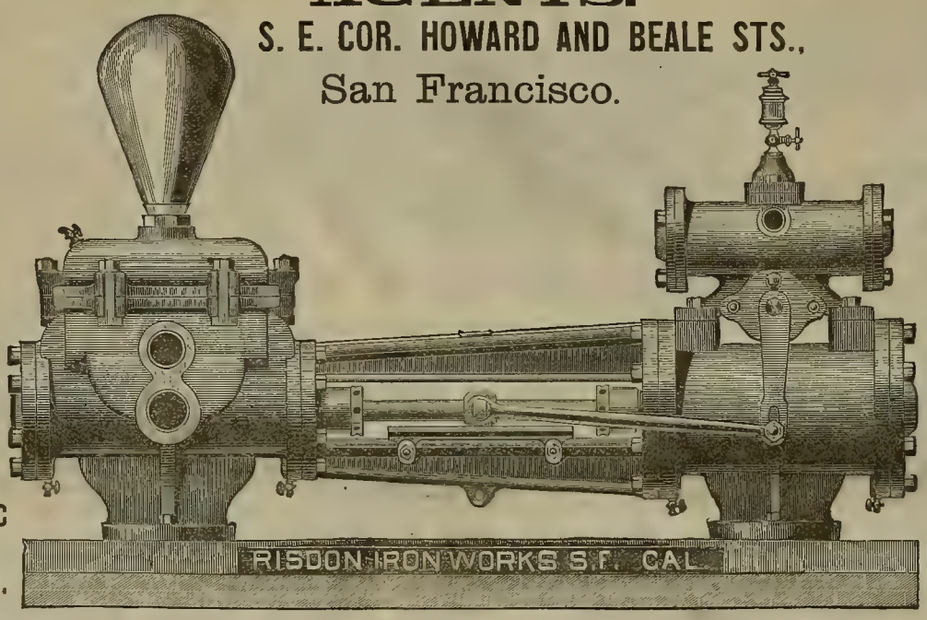
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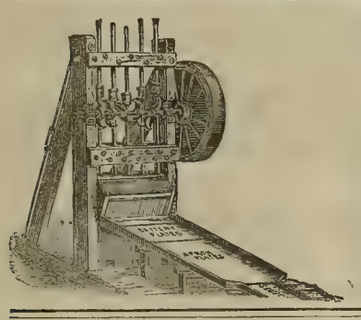
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MINING AND SCIENTIFIC PRESS.

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The Clayton Air-Compressor.

When we stop to consider the vast number of uses to which compressed air is put, and how every day some new experiment, rendered successful by employing compressed air, is turned to the practical benefit of some branch of trade, it is strange that we find but one establishment devoting their whole time and attention, the entire capacity of their works, and the brains of experienced men, to the development of a machine that will meet this growing demand for a perfect air-compressor.

The first Clayton air-compressor was built in 1873, to run the tunnels in New York City for the sunken tracks of the Harlem railroad, and so successfully did this one work that in a few years Clayton air-compressors were in use on almost every important engineering work in the country, and the excellence of their design made them recognized throughout the profession.

Mr. James Clayton, foreseeing the immense field there would be for a perfect machine of this kind, gradually withdrew from the manufacture of hydraulic machinery, and labored solely to improve his air-compressor—strengthening here, altering the design there, and steadily patenting his improvements. Our illustrations show the ground plan and side elevation of a perfected Clayton air-compressor. In this improved form an air-compressor is produced which will furnish a given amount of air, under high or low pressure, at a minimum first cost, maximum efficiency, few repairs, and great accessibility, should they become necessary.

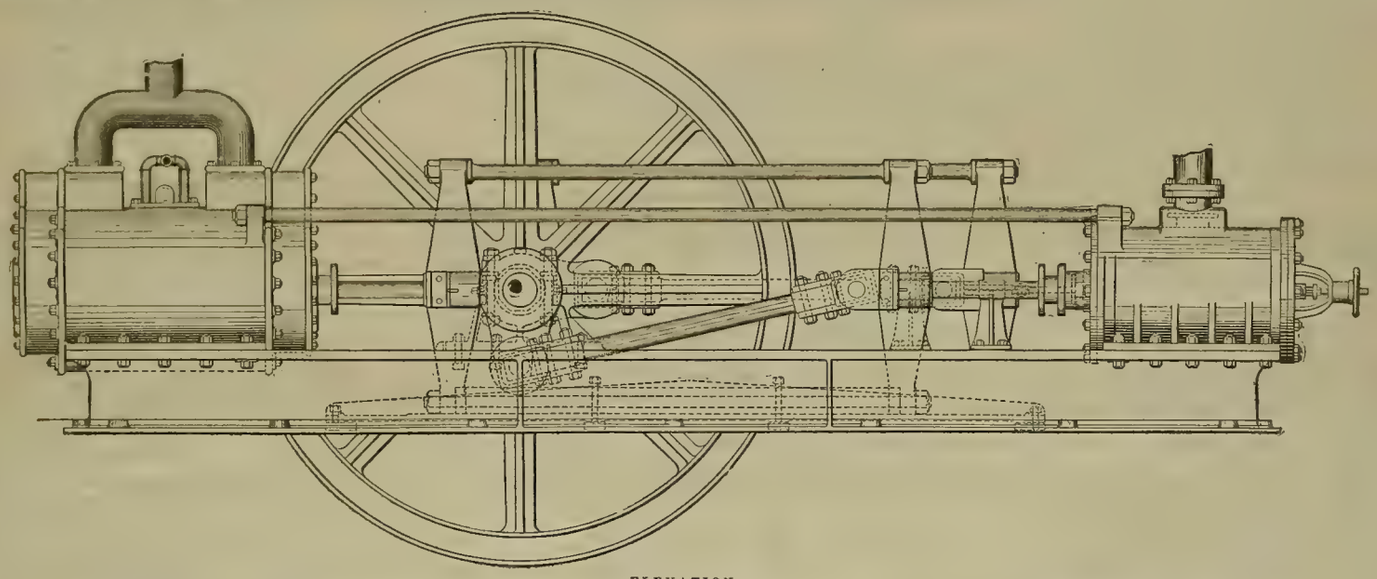
The following is a brief description of the important points of this machine, which render these results attainable:

The patent connecting-rod arrangement is a combination of the slipper-guide, vertical cross-heads and connecting-rod, which admits of the placing of the latter between the steam and air-cylinders, the tops of which are tied together with heavy brace-rods, thus preventing the bed-plate buckling with the strain of the compression, which comes in a direct line with the bed-plate and the brace-rods at the same time. By this arrangement, a much stronger machine can be built with less gross weight and with a saving of considerable floor-space over the compressors built with fly-wheel (or wheels) on the end of the machine. The fly-wheel is placed in the center of this compressor, thus obviating any danger or personal injury through coming in contact with it, and there is no necessity for removing it to get at any part of the steam or air-cylinders. It will also be noticed that the shaft and air-cylinders are not exposed to the heat of the steam-cylinders.

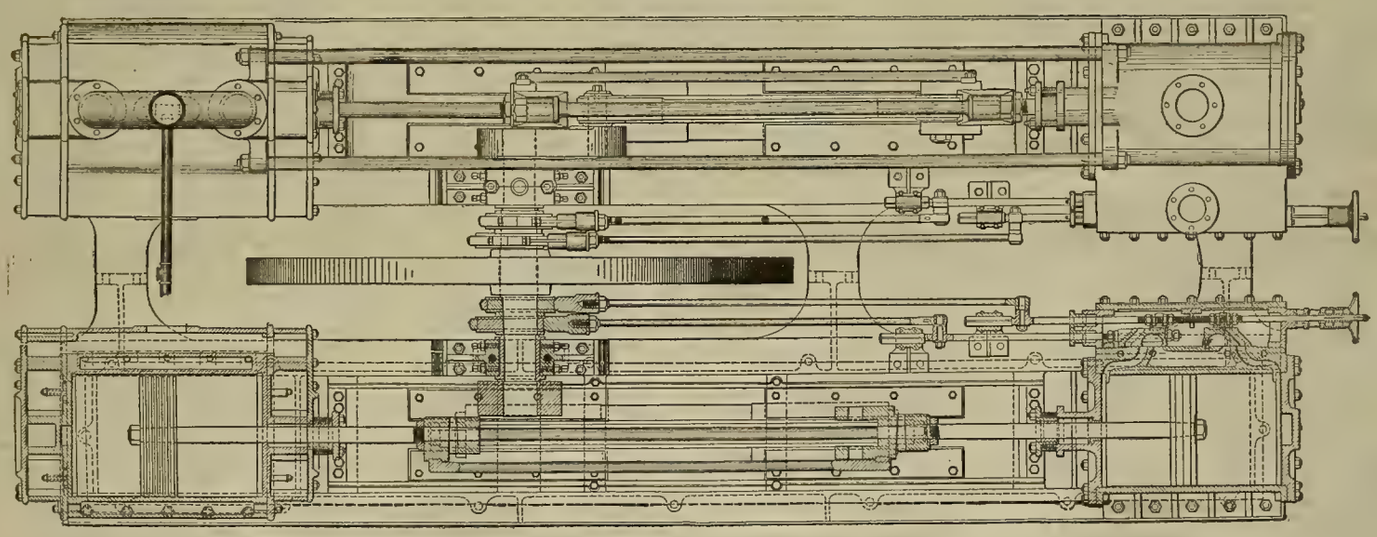
The patent safety suction valves have seats which are firmly screwed into the heads, and the valves secured by two nuts, safety stems, and a spring cotter, preventing them from ever becoming loose and getting inside the cylinders. The "cages" for preventing the valves falling into the cylinder (common in other compressors) are dispensed with, the safety stems answering their purpose, and, therefore, the piston travels the full length of the cylinder, there being no lost space at either end of the stroke. The valve faces are protected by a slightly elastic composition disc which prevents any hammering and consequent leakage. These discs can be renewed at any time at slight expense, and the valves and seats on the larger compressors can be inserted or removed from the outside by means of the tools furnished with the compressor.

The air cylinders are bolted to the bed-plates in a line with the steam cylinders, but at the greatest distance from the heat thereof, and are surrounded by water-jackets, the design of

(*Continued on page 337.*)



ELEVATION.



PLAN.

CLAYTON IMPROVED DUPLEX AIR-COMPRESSOR.

[Copyright by HENRY G. HANKS, 1889.]

Mercurial Minerals and Their Associates.

(Concluded from last issue.)

[Written for the MINING AND SCIENTIFIC PRESS.]

O—Some dark-colored specimens from the Phœnix mine in Napa county, supposed for that reason to contain metacinnabarite, were found when examined microscopically to owe their color to a purple or amethystine quartz, in which the scarlet cinnabar was imbedded. Rock sections of this variety make very beautiful and interesting objects.

P—Cinnabar in a disintegrated condition when examined microscopically is, as a rule, more interesting than otherwise. A specimen so examined showed the cinnabar to be in broken fragments and individual crystals; the quartz was hyaline and in perfect doubly terminated crystals and clusters and tufts of radiated and scarlet cinnabar. Gypsum, floss ferri and other minerals were observed.

Q—Concretionary masses of pure cinnabar resembling pseudomorphs after globular and radiated pyrite, have been found in the California Coast Range of mountains, in Kern county, and recently at Los Burros, Monterey county, with gold and stibnite. Being generally found in the beds of streams, this variety is called "Stream Cinnabar."

R—Specimen of Cinnabar from the Camp Floyd Mining District, Utah, 55 miles southwest of Salt Lake City and 8 miles from the Mono mine.

This is an orange-red mineral, rather heavy, rugose, cellular and rather uninteresting.

Examined microscopically it was found to be an amorphous solfataric rock mineral, rather soft and perfectly white; covered with an incrustation of cinnabar, also amorphous.

The microscope reveals numerous pipe-like channels through which, without doubt, jets of steam issued while the solfatara was active. No clew was discovered that would account for the peculiar color of the cinnabar; an assay yielded 5.5 per cent of mercury.

6. Coccinite

Is a doubtful mineral found at Casas Viejas, Mexico. It is an iodide of mercury, possibly a mechanical mixture. An artificial iodide of mercury, mentioned elsewhere, is sometimes used as a pigment, under the name iodine scarlet.

7. Colordoite.

This rare mineral is a telluride of mercury, from Boulder county, Colorado, described and named by Prof. Genth in 1877. It occurs massive, granular, color iron-black, luster metallic, fracture uneven. The exact composition is not known. In a glass tube it decrepitates, fuses and yields a sublimate of mercury and oxide of tellurium, leaving behind a residue of iron. It is found in several tellurium mines at the locality, associated generally with gold. Specimens exhibited in San Francisco in April, 1877, were very rich in the precious metals. A description of them may be found in the MINING AND SCIENTIFIC PRESS, Vol. 34, Folio 232.

8. Gold Amalgam.

This rare mineral, as the name indicates, is an amalgam of gold and mercury, containing also a small portion of silver. It was first found in Colombia, South America, with platinum. It is said to exist in California near Mariposa, but the writer has never met with it. Nothing more is known except that it is found in small grains and crumbles easily.

9. Lehrbachite,

So called because it has been found at Lehrbach in Germany, is a rare selenide of mercury and lead. It is supposed to be a mechanical mixture of clausthalite and selenide of mercury.

10. Livingstonite

Is thought to be a double sulphide of mercury and antimony. It is found only in Huitzuco, State of Guerrero, and at Guadalcazar, both in Mexico. It was named after the celebrated African traveler.

In May, 1874, Mariano Barcena described this rare mineral in *El Minero Mexicano*, from which it may be learned that it resembles stibnite, and occurs in thin prisms in columnar groups. Specific gravity 4.81, fuses at first touch of the blowpipe flame, and emits copious fumes of antimony; decomposed by hot nitric acid, in which a white insoluble portion remains; hydrosulphuric acid causes two precipitates, one yellow and the other black; an assay shows the presence of about 10 per cent of metallic mercury. The mineral occurs in a matrix of calcite, gypsum and valentinite, and is associated with sulphur, cinnabar, stibnite, and other minerals. A more recent analysis gives the following result:

Sulphur	29.08
Antimony	53.12
Mercury	14.00
Iron	3.50
Total	99.70

Mr. Andrew Rocca, superintendent of the Great Western Quicksilver mine, near Calistoga, Napa county, recently presented the writer with a fine specimen which he brought from the locality named above. A study of this specimen showed that it is impure. The following results were obtained:

Color nearly black, streak powder aurora red. If rubbed on a porcelain plate, the same colored streak was obtained. If this was partly removed with a dry rag, a scarlet streak remained. This led to the suspicion that the mineral was a mechanical mixture, but the closest microscopical scrutiny failed to prove this to be the case. Hardness, 2; specific gravity, 3.75. In a closed tube alone, a black sublimate forms near the assay, and a yellow one of sulphur beyond. This experiment repeated with addition of soda, a sublimate of metallic mercury rises, which condenses into distinct globules in the cold part of the tube. On charcoal the mineral fuses very easily, gives off white fumes and leaves a considerable nonmagnetic, infusible, residue.

Nitric acid acts slowly and weakly on the mineral in the cold, and does not wholly decompose it; addition of hydrochloric acid causes energetic action, by which it is wholly and quickly decomposed to a yellow solution, and a considerable insoluble residue. When the solution is largely diluted with water, no precipitate falls. Hydrosulphuric acid immediately throws down an orange-yellow precipitate, and an immersed plate of copper, a precipitate of metallic mercury. The insoluble residue was found, on examining it microscopically, to be mainly silica, including some small but well-formed quartz crystals.

11. Magnolite

Is an uncertain telluride of mercury, supposed to result from the decomposition of coloradoite No 7. It was described by Prof. Genth in 1877. The specimens were from the Keystone mine, in the Magnolia mining district, Colorado. It is a white mineral occurring in minute acicular silky crystals, which are blackened by ammonia. The composition is supposed to be telluride of mercury and oxide of iron.

12. Mercury.

It has been shown that native mercury was known to the ancients, and that the Romans called it "argentum vivum," in contradistinction to "Hydrargyrum," the same metal produced by artificial means. From that time to the present, it has been found in considerable quantity at the principal quicksilver mines of the world. It differs in no respect from the metal reduced from the ores. We frequently find it mentioned in old works on minerals and mining; the following are examples:

Museum of Francisco Calceolanus the Veronese, by Andrea Chiocco, Verona, 1622, Fol. 439: "Quicksilver mineral is a fragile stone inclining to dusky redness, being equal in weight to lead itself, in the whole mass of which little drops of quicksilver are scattered, here and there, fossil cinnabar of Dioscorides, and less of other minerals; hence they extract quicksilver of the metallic kind from Mount Hydra not far from Goritia." 440: "The quicksilver mineral of Saucensi is a hard stone heavy in weight, the whole body of which is stained lead color not without some luster. The stone being violently shaken, does not give forth the quicksilver from itself, but reduced to a powder by baking, by the power of the furnace quicksilver of the true color is brought forth." * * *

Cramer, 1764, Fol. 159: "*Native* fluid, *quicksilver*, called *virgin mercury*, most commonly lies concealed in an ash-colored soft stone easy to be cleft; in which it may be detected by the naked eye or by means of microscopes under the form of small drops. It is found in great quantity, especially about *Idria*, so that sometimes little drops of it running together out of the *matrix* may be gathered in small vessels."

Cronstedt, System of Mineralogy, 1772, Fol. 208: "Quicksilver is found native or in a metallic state, *mercurius nativus virgineus*. This is found in the quicksilver mines of Idria or Friuli in the Lower Austria in clay, or in a black slaty lapis ollaris out of which it runs either spontaneously or by being warmed even in the hands. It has several times been found at Herr Sten's Bottn in the mines of Salberg in Westmanland, and sometimes also amalgamated with native silver."

Nicholson's Chemistry, London, 1795, Vol. 2, Fol. 598: "Mercury is found in a native state sufficiently distinguishable from any other metallic substance, by its fluidity in every ordinary temperature of the habitable parts of the globe. Bergman doubts whether it be ever found incontaminated by any other metal. It is found in the quicksilver mines in small brilliant globules disseminated in different gangues. Mongez asserts that it is mostly in a state of great purity. Sometimes it is collected in the cavities of rocks as at Idria, in Spain, and in America, and in other instances it is disseminated in the earth, in clays or adherent to quartzose stones, potstone, mica, or else mixed with the different ores, as the white or red silver ores, galena, white arsenic or cinnabar. * * * M. Sage in the *Journal de Physique* for 1784 mentions a Calciform ore of mercury of a red-brown color, difficult of fracture, presenting a granulated texture more red than externally. It frequently contains running mercury in its interstices. By distillation the mercury is obtained in the proportion of 91 parts in the centenary. It contains a small part of silver and comes from Idria."

The presence of native mercury in the Idria mine led to its discovery in 1497. A cooper whose shop stood near by, one day placed a tub or cask he had just finished under a small falling stream to ascertain if it was water-tight. Going soon after to remove it, he found it unusually heavy, saw metallic mercury in the bottom, and the great Idria mine was discovered.

The early workings of this mine were wholly for metallic mercury, as will be fully described elsewhere.

The MINING AND SCIENTIFIC PRESS, Vol. 26, Fol. 232, states that in N. W. Guatamala there is an intermittent spring of quicksilver; the stream is the size of a quill, but not uniform; the cause is thought to be volcanic heat.

Native mercury is not uncommon in California. The Rattlesnake mine, Sonoma county, is an unusually prolific locality, where it occurs with cinnabar. The mercury is disseminated through a soft-grained clay like rock. It is related that on one occasion when a quantity of ore had been placed in a sack, on lifting it, a pool of metallic mercury was found beneath. Up to 1873 the ore was worked in old-fashioned rockers by which the mercury was concentrated.

The Rattlesnake when first discovered was known as "The Native Quicksilver Mine," and pools of that metal settled on the floors of the tunnels.

Mercury is found disseminated in globules and collected in pockets in quartz geodes at the Pioneer mine in Solano county with cinnabar and bitumen. Six pounds of metal were once taken from a single cavity.

It is also found in the Uncle Sam mine, Lake county, and in the Altoona, Trinity county. The Wall Street mine, in Lake county, is also a noted locality of native mercury; cinnabar has sublimed unchanged in the lower levels, while near the surface metallic quicksilver permeates the claylike formation.

The New Almaden also produces native mercury, but rarely; a specimen in the State Museum, No. 1729, shows an association of native mercury with cinnabar in vein stone.

Native mercury occurs in the Oceanic quicksilver mine, San Luis Obispo county, in blue sandstone.

Dr. S. M. Mouser informed the writer that in 1863, in an open cut made by the Spring Valley Water Company on Market street, San Francisco, native mercury was found in the rocks.

The presence of native mercury in a California quicksilver mine is not considered a good indication by the miners. They much prefer to find cinnabar, even if the ores be very low grade, although when questioned on the subject they seem to be at a loss to give a good reason for this opinion.

13. Metacinnabarite.

This is a rare mineral which is of more frequent occurrence in California than elsewhere.

When first observed it was thought to be onofrite, because the blowpipe examination revealed at least traces of selenium. Mr. E. G. Moore was first to discover its true composition and describe it as a new mineral. His very elaborate paper, including the study, analyses and description of the mineral, was first published in the *Journal Fur Prakt Chemie*, in 1870, which was copied into the *American Journal of Science and Arts*, third series, Vol. 3, 1872, Fol. 36, to which the reader is referred. At that time the mineral was only known in the amorphous state, but Mr. F. E. Durand of San Francisco discovered crystals which were described and figured in a paper read by him at the regular meeting of the California Academy of Sciences, April 15, 1882 (Proc., Vol. 4, 1873, Fol. 219).

Since that date elaborate figures and measurements of crystals have been made and published, both in America and Europe, by mineralogists of note. It is a curious fact that metacinnabarite is not really a new mineral as supposed, but was known in 1758, for in Cronstedt's System of Mineralogy, second English translation, London, 1772, Fol. 209, foot note, may be found the following notice:

"It is said that there is also found in Idria a black cinnabar that retains its color in the sublimation, which seems to indicate an abundant phlogiston in the sulphur; but this requires, however, farther examination."

Metacinnabarite is like cinnabar in composition, but differs in color streak, specific gravity, and luster. It corresponds to the black sulphide of mercury obtained by mixing the elements artificially, while cinnabar conforms to the red sulphide obtained by sublimation.

Hardness, 3; specific gravity, 7.7; luster metallic, in closed glass tube black sublimate. With soda yields metallic mercury, has an odor of sulphur when heated, and sometimes emits a faint smell of selenium. On platinum foil at a red heat is wholly volatile.

The color of metacinnabarite is grayish, not intensely black. The streak is also black, but as it generally occurs with cinnabar, an unexpected red streak is sometimes obtained. The specimen under examination should be first carefully examined under the microscope.

The following is the mean of two analyses by Moore:

Sulphur	13.82
Mercury	85.79
Iron	.39
Quartz	.25
Total	100.25
Corresponding to	
Sulphide of mercury	98.92
Sulphide of iron	.83
Quartz	.25
Total	100.00

Guadalcazarite and Laviglianite are thought to be varieties of metacinnabarite.

Metacinnabarite was first discovered in the Redington mine, Lake county, California, where it was a common and rather abundant mineral. It was afterward found in several other mines with cinnabar and other minerals, but is still considered a rare species.

The known Pacific Coast localities are the Redington and Great Western mines in Lake county, the California mine in Yolo county, and the Bonanza mine, Douglas county, Oregon. Specially fine crystals are credited to the Redington and California mines, in which, however, it is far more abundant in the amorphous condition.

14. Onofrite.

This rare mineral is a variety of tiemanite, No. 16. It was first found at San Onofre in Mexico, whence the name. It occurs also at Clausthal in the Hartz and at Marysvale in Utah. It has the following composition:

Mercury	75.3
Selenium	24.7
Total	100.0

Hardness, 2.5; specific gravity, 7 62; always massive, compact, granular, luster metallic, color steel to blackish lead gray, streak shining, has no cleavage.

Before the blowpipe on charcoal emits the characteristic odor of selenium and forms a white incrustation.

Brush assumes an isomorphous series, including metacinnabarite and tiemanite.

15. Spaniolite,

Called also hermesite and schwatzite, is a variety of tetrahedrite containing mercury. Specific gravity, 5—5.6; color, gray to black. It contains sulphur, antimony, copper, iron, and mercury in varying proportions, the latter from 2.7 to 16 69 per cent.

Cronstedt, 1772, Fol. 209, describes a sulphide of mercury and copper: "*Mercurius cupro-sulphurato mineralisatus.*"

16. Tiemanite.

This is a rare mineral, a selenide of mercury, having when pure the following composition; analysis by Rammelsberg:

Mercury	74.5
Selenium	25.5
Total	100.0

It is amorphous, opaque; color, steel gray; hardness, 2.5; specific gravity, 7.10, 7.37. In a closed tube with soda gives a sublimate of metallic mercury; on charcoal, volatilizes and emits an odor of selenium.

It occurs in Clausthal, Hartz, and is said to be found in Utah with onofrite and barite in seams in limestone in the Seveer mine, near the Lucky Boy mine, Marysvale.

17. Tocornalite

Is a chloro-iodide of mercury, of which very little is known. It has been found only in Chili, and was described by Domeyko. It is pale yellow in color and contains about four per cent of mercury. It is a very rare mineral.

Associate Minerals.

(1) *Ammonia* and ammoniacal salts occur in thermal waters that issue from fissures near quicksilver mines in California; notably in Lake county near Clear lake. The water of a hot spring analyzed by E. G. Moore (Geological Survey of California, Geology, Vol. 1, fol. 99) shows 107.76 grains of bicarbonate of ammonia per gallon. The water of Clear lake gives decided reactions for ammonia, and all the waters of the solfataric regions of the State contain enough ammonia to be considered decidedly bad were its presence owing to organic decomposition.

(2) *Aragotite*, a new mineral (for description see Fourth Annual Report State Mineralogist, 1884, fol. 289), is found in the New Almaden and New Idria mines of California, but is of rare occurrence. There is a specimen, No. 1275, in the State Museum, from the New Idria.

(3) *Borax* and boracic acid (sassolite) occur in the waters of quicksilver mines, and especially so in Lake and Napa counties, at the Sulphur bank, and in Borax lake in this State.

(4) *Bromine* in traces has been found in the mineral waters of the quicksilver region.

(5) *Calcite* is a common mineral associate of cinnabar in California and elsewhere. It occurs in the quicksilver mines of Guancavelica in Peru.

(6) *Carbonic Acid.*—This gas is so common in many of the California quicksilver mines, that expensive machinery to remove it from the shafts and workings is required, without which, work in the deep levels would be impossible. Small animals have been asphyxiated at the mouth of the shaft by the overflowing gas. In the beds of small streams flowing near the mines, bubbles of carbonic acid gas are continually rising.

(7) *Coquimbite* occurs in the surface matter of the Sulphur Bank quicksilver mine in considerable quantity.

(8) *Electrum.*—This mineral is found in small particles attached to gold at Sulphur creek, Colusa county, California.

(9) *Epsomite* occurs in the Redington quicksilver mine in Lake county with cinnabar; and in several other mines in California. Fine fibrous curved specimens come to us from the Buckeye quicksilver mine in Colusa county.

(10) *Galena.*—This mineral occurs with cinnabar and other minerals in the great Guancavelica mines in Peru. (Bonycastle, Spanish America, Vol. 2, fol. 134.)

(11) *Gypsum* in several forms is found in California quicksilver mines, and also at Guancavelica, Peru.

(12) *Gold* occurs at Sulphur creek, Colusa county, with cinnabar. Specimens have been described under cinnabar. According to a

writer in the MINING AND SCIENTIFIC PRESS, Vol. 15, fol. 18, gold is found in several quicksilver mines near the New Idria, Fresno county, and the same writer says it occurs in the New Almaden mine, all in California.

(13) *Hematite*, according to Bonycastle, is found with ores of mercury at Guancavelica, Peru.

(14) *Idrialite.*—Bitumens are abundant in California quicksilver mines, so much so that they interfere greatly with reduction. It is thought that this mineral is generally idrialite, but it has not yet been so proven. (See Petroleum and Aragotite.)

(15) *Iodine* is found in mineral springs near California quicksilver mines. The thermal spring near Clear lake, referred to before, contains iodide of magnesium. A mineral spring containing iodine is situated at the mouth of Grizzly canyon, Lake county, about six miles from Wilbur springs.

(16) *Magnetite* occurs in the quicksilver mines of Guancavelica, Peru; such mineral association is not known in California.

(17) *Mineral Waters.*—Mineral waters are found at or near all the quicksilver mines of California. The Etna springs, which have attained merited celebrity, issue from the old shaft of the Valley quicksilver mine, now filled to overflowing. The writer has often been at the bottom of the shaft while the mine was in operation. So universal is this fact that wherever mineral springs are known, the quicksilver miner goes to prospect. The same solfataric action which produces the mineral water, places the quicksilver minerals in the fissures.

(18) *Natural Gas.*—Carburetted hydrogen, which issues from the accidental fissures in the rocks at solfataric vents in several localities in California, on being ignited, continued to burn for a considerable period. Hydrosulphuric acid and sulphurous acid gases resulting from subterranean decomposition, also issue at the surface and are absorbed by waters to which they impart peculiar chemical characteristics. They are known as sulphur springs.

(19) *Obsidian.*—The remains of extinct volcanoes are common at the quicksilver mines. Among the minerals produced by past volcanic energy, obsidian is frequently met with.

(20) *Orpiment.*—This is not an unusual accompanying mineral in quicksilver mines, but is unknown in California. In Hungary, mercury is extracted from orpiment. At the Paris Exposition of 1878, specimens of the mineral and the resulting mercury were shown. Bonycastle, Spanish America, 1818, Vol. 2, Fol. 135, thus refers to the presence of orpiment in the great Santa Barbara mine at Guancavelica, Peru: "The mine was opened in September, 1570. It was divided into three stores, named *Brocal*, *Comedio* and *Cochapata*, the last of which the Government forbid to be worked, the bed containing red and yellow sulphureted arsenic or orpiment, which was the cause of many deaths."

(21) *Petroleum.*—In or about the year 1869, in sinking a shaft in the Redington mine, the workmen came to a deposit of liquid petroleum. There was more than 50 gallons; half that amount was skimmed from the pump-water and saved.

(22) *Potassium.*—Potassium salts, generally the chloride, are found in the waters of California quicksilver mines.

(23) *Pyrite.*—This is a very common mineral in the quicksilver mines of California. It occurs also elsewhere in similar mines.

(24) *Pyrolusite* occurs with cinnabar at Sulphur creek, Colusa county. It has been referred to before.

(25) *Quartz.*—This mineral in various forms is almost invariably found in the quicksilver mines of California. It is also a common associate in other quicksilver mines the world over.

(26) *Realgar* occurs with Orpiment, which see.

(27) *Soda.*—The salts of sodium, generally the chloride (Halite), bi-borate (borax), and sesqui-carbonate (trona), are found in the mine waters and mineral springs in the quicksilver region of California.

(28) *Selenium* has never been found isolated in California, but the peculiar smell of that element frequently observed at the quicksilver furnaces, leads to the supposition that it exists in the ores in some form, but the minerals are so diffused that they have so far escaped notice.

(29) *Stibnite* is frequently associated with quicksilver minerals in California. It is also found in a like union in the quicksilver mines of Borneo and Mexico.

(30) *Sulphur* is a universal associate of quicksilver ores, both in California and at other localities in the world. It is generally combined with different bases, but is sometimes free as at the Sulphur Bank, Lake county; the Mud Volcanoes, San Diego county, and near Kern lake in Kern county.

Cinnabar occurs in the Barcelona mine, Nye county, Nevada, with silver minerals.

It is a curious fact that wherever quicksilver has been deposited or is being deposited, nearly all the volatile minerals are found, and many of the soluble ones.

PROFITS OF THE MECHANICS' FAIR.—At a meeting of the trustees of the Mechanics' Institute held October 15th, Treasurer Bauer made the following statement of receipts from the Twenty-fourth Industrial Exhibition: Tickets sold at office, $40,607; tickets sold outside, $3361; tickets sold to members, $4883.50; excursions, $812.63; catalogues, $146 40; gas, $293.50; privileges, $6604. Total, $56,708.03.

Electrical Apparatus in Africa.

The Forbes Reef Gold Mining Co. of Transvaal, South Africa, have ordered from the Sprague Electric R. R. & Motor Co. of New York, a complete electrical equipment for transmitting 140-horse power three miles. At a waterfall three miles away are to be three Pelton wheels, provided by Fraser & Chalmers of Chicago. The *Engineering and Mining Journal* describes the plant as follows:

To each of the Pelton wheels will be belted one far-transmission constant potential Edison dynamo of 50,000 watts or 67 H. P. capacity each. To the other wheel will be belted a dynamo of the same type and voltage as the others, but of 40,000 watts or 55 H. P. capacity. These dynamos are similar in appearance to the standard Edison dynamo for incandescent lighting and are built at the Edison Machine Works, but their winding is especially adapted according to the Sprague method for the work of long-distance transmission of power. These machines have an efficiency of 95 per cent. The station will be lighted by incandescent lamps and will be complete in every detail.

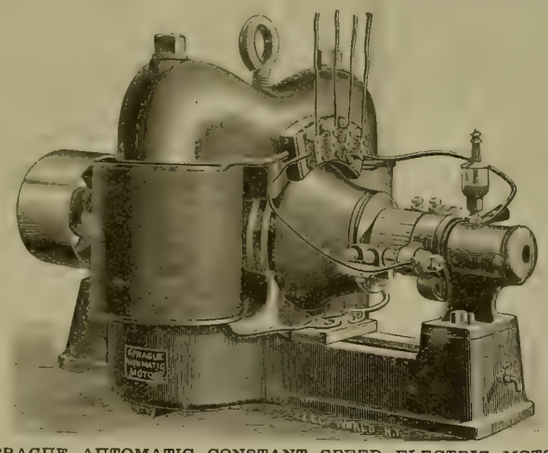
The wires, which are insulated, will be carried overland across country on wooden poles to the point of distribution, where are located the four long-distance transmission motors of the constant potential type, one of 80 and three of 20 H. P. capacity each. These motors are divided into two groups, one single 20 H. P. motor forming one group, and the other two 20 H. P. motors and the 80 H. P. motor forming the other group. Each group is supplied with current by a separate set of wires, thus practically insuring a constant flow of electricity under all circumstances.

The motors are wound to run on a constant potential circuit, and all the motors of each group are connected in parallel from negative to positive wires, thus equalizing the strain on the dynamos when the loads are thrown on and off. This method of connecting dynamos and motors in parallel is used in all the Sprague installations for the transmission of power, and it is claimed is much superior in reliability and economy to the series method of connection by putting each motor on a separate circuit. In principle it is the same as supplying a city with water, using city mains instead of running a separate pipe from the reservoir for each consumer.

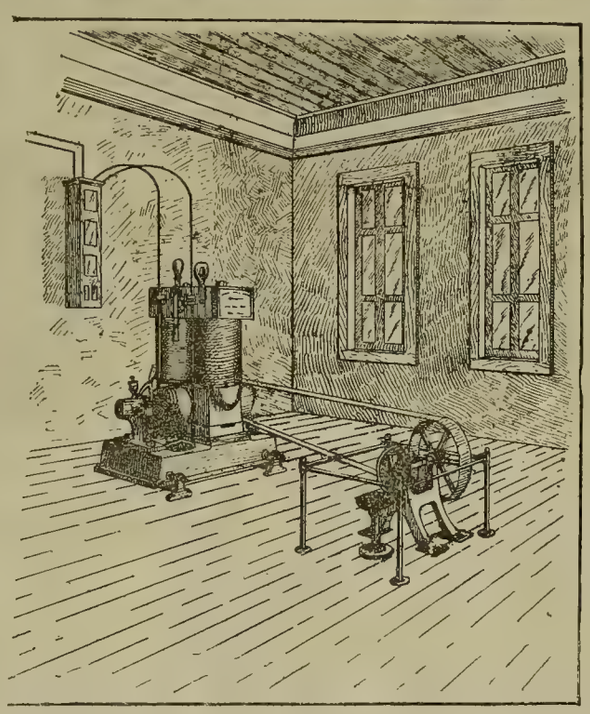
The method of regulating the motors and keeping them at a constant speed, in spite of varying loads, is accomplished by winding the motors in a special way, so that there is no mechanical governor to get out of order.

The governor being in the winding, and consequently inert, the motors are more durable, and the use in what nearly all machines proves to be a delicate piece of mechanism is avoided.

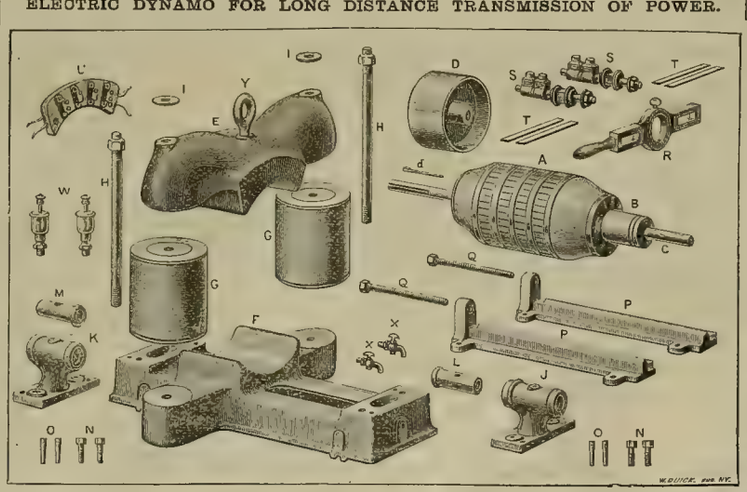
The Standard motor is now made in parts divided for shipment, where transportation, as in mining districts, is difficult. These parts are made interchangeable in each type of machine. In the accompanying cut showing the parts, *A* is the armature; *B*, commutator; *C*, shaft; *D*, pulley; *a*, pulley key; *E*, keeper; *F*, foundation plate; *G*, field magnet; *H*, connecting bolt; *I*, washer; *J*, pillow block, composition; *K*, pillow block, iron; *L*, *M*, pillow-block cushings; *N*, pillow-block bolts; *O*, pillow-block pins; *P*, rails; *Q*, rail bolts; *R*, rocker arm; *S*, brush-holders; *T*, brushes; *U*, connecting board; *W*, oil cups; *X*, pet cocks.



SPRAGUE AUTOMATIC CONSTANT SPEED ELECTRIC MOTOR.



ELECTRIC DYNAMO FOR LONG DISTANCE TRANSMISSION OF POWER.



PARTS OF ELECTRIC MOTOR.

Con. California and Virginia.

At the annual meeting of Con. California and Virginia, Oct. 14th, 181,349 shares out of 216,000 were represented, and the following officers elected: Chas. H. Fish, president; Geo. R. Wells, vice-president, and H. B. Havens, Con. O'Connor and Wm. S. Lyle, directors. A. W. Havens was re-elected secretary, and D. B. Lyman, superintendent. The secretary's financial statement showed a credit of $70,000. The superintendent's annual report showed that there has been extracted from the various levels during the year 136,189 tons of ore, all of which has been milled by the Comstock Mill and Mining Co., and from this ore there has been produced bullion of the assay value of $3,327,281, which shows an average yield of $24 43 to the ton. This bullion carried $1,544,595 in gold and $1,782,686 in silver. The above showing is not so good as that made last year, when 148,302 tons of ore, which yielded bullion having a value of $4,060,978, or an average of $27.24 per ton, was extracted. The decrease has, therefore, amounted to 12,113 tons of ore, $733,699 in the bullion yield, and $2.81 per ton in the average yield per ton. The report virtually states that the old California ground has not been prospected to any extent, the ore and main work having been done in the old Con. Virginia ground. The report states that from the 1500-foot level upward there remains a portion of the old stopes to work over. Judging from the portion that has been already worked, and which has been productive, there is every reason to believe that the unworked part in proportion to its extent will be equally productive in bullion. North from the main shaft and westerly (about the center of the California ground) there still exist quantities of ore in places, the extent and limits of which are as yet undefined, in ground adjacent to old stopes which are visible at many points. Taking the report as a whole, it gives hope for much to be expected with more extensive work in the unexplored levels commenced.

OFFER REJECTED.—Oct. 13th a meeting between the ranchers and millmen was held at Genoa. The object of the meeting was to see if an amicable settlement could be made between the millmen and ranchers respecting the water question. M. Cohn of Carson was chairman of the meeting. Frank Newlands, on behalf of the Sharon estate, through the mill attorneys, made a proposition to take a decree for 6000 inches of water instead of 8000, and during the years 1890 and 1891 give the ranchers water until July 15th. After this the mills would take all the water the year round, and put up an equal sum with the ranchers to build storage reservoirs. After considerable talk pro and con, the ranchers decided not to accept the terms offered by the millmen, and so the meeting adjourned. The millmen will now begin suit against about 100 ranchers on the Carson river, and the legal battle will be fought to the bitter end.

COPPER.—James Lewis & Sons' Liverpool copper circular, under date of Oct. 1st, states that the visible supply of copper in England and France has steadily decreased from 124,853 tons on April 1st to 106,033 tons on Oct. 1st. In the circular they say that the abnormal demand to supply the wants of consumers all over the world, who had reduced their purchases to the smallest possible limit during the prevalence of the high prices due to the operations of the French syndicate over a period of 16 months, appears now to be satisfied, and although the consumption due to the revival of trade and the increased use of electricity is still very large, the supplies appear to be quite equal to it.

THE Government has advertised for bids for the construction of torpedo cases for the defense of San Francisco harbor.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

NORTH GOVER.—Amador *Ledger*, Oct. 16: A meeting of the stockholders of the North Gover Improvement Co. was held in the Knights of Pythias hall, Amador City, on Wednesday evening. The president of the meeting was J. R. Tregloan; secretary, J. Myers. The meeting was addressed by R. M. Ford and J. R. Tregloan, who dwelt at length on the advantages of the mining district in which the North Gover is situated. The object of the meeting was accomplished by electing five trustees—Messrs. Tregloan, J. Myers, W. Ford, J. Lepley and C. Culbert—who are to confer with the trustees of the original company as to the terms of the bond of the property. Eighty-nine thousand shares in the new company have been sold. The Drytown Consolidated has levied assessment No. 4 of two cents per share, delinquent November 9th. The Amador gold mine paid off one month's wages on the 12th. The superintendent went to San Francisco this week on business pertaining to the mine. The new 40-stamp mill of New London, near Plymouth, is being rushed ahead as fast as possible. The South Spring Hill has completed the laying of their new water-pipe which extends from the Talisman to the adit of the South Spring shaft, it being the intention of the company to run by water their air-blower in place of steam and thus do away with all the noise and clatter of the steam, making more room in the hoisting works and furnishing a cheaper motive-power. J. R. Tregloan is working the Talisman; a night and day shift runs the crosscut. The moment water arrives, the machine drills will be placed in position.

Butte.

THE CHEROKEE MINE.—Oroville *Mercury*, Oct. 16: It is understood at Cherokee that the big hydraulic mine is to be changed into a drift mine as soon as possible, and people, generally, applaud the wisdom of the management in making the change. Supt. Gregory has urged this for some years, and is jubilant over the prospect. The tunnel will be run in from the west side of the gold-bearing gravel hill, and, having sufficient incline, will drain itself. Since the surveys have been made, it has been found that the cost of getting to the gravel will be much less than the managers anticipated, and the chances are that this famous old mine will again spring into prominence as one of the great institutions of the State.

Calaveras.

BONDED.—Angels *Echo*, Oct. 19: We understand that the Gold Valley mine, adjoining the Star of India mine, owned by Otto Dolling & Co., has been bonded to a San Francisco syndicate. Otto claims that it is one of the best mines in the country.

STRIKE.—John Cates, who is engaged in mining on Bald hill, near Altaville, made quite a little strike last Saturday, taking out nearly $40 during the day. He says he has still a good prospect to work on.

El Dorado.

GARDEN VALLEY DISTRICT. — Placerville *Observer*, Oct. 23: Mr. H. Lawrence, superintendent of the Lone Jack mine at Garden Valley, was in town Thursday of last week, and was a caller at the *Observer* office. He says that a correspondence in the MINING AND SCIENTIFIC PRESS, copied in the *Observer* of last week, relating to mines in the Garden Valley district, is in error where the correspondent says that "the Rosencranz and Taylor mines lie east of the Lone Jack, as that would lead to the conclusion that the mother lode runs east and west, when in fact the course is north 25 degrees west." The Rosencranz and Taylor mines lie east and north of the Lone Jack. Mr. Lawrence informs us that at the 400 level at the Lone Jack they have run drifts 60 feet each way north and south on the vein, and that the ledge is 16 feet wide of fair-grade ore.

Mariposa.

THE CHAMPION. — Mariposa *News*, Oct. 16: Work is progressing on the levels at the Champion or Barleyfield mine now owned by Jas. Ridgway and a Chicago Co. Good milling ore has been run through since they commenced running the levels. On Monday they struck one that is supposed to go over $1000 to the ton. We hope this will continue. This Co. is conducting its business on a business basis. We want a few more such companies in the county. They are now building an immense arastra to thoroughly prospect the rock. It will be run by steam. If a good mine is found here a large mill will be put up. Here's success to the Champion.

Nevada.

CHAMPION.—Nevada *Transcript*, Oct. 18: It is reported that the ledge in the lowest levels of the Champion mine has widened to six feet, and samples recently sent to the Selby Smelting Works gave high milling assays. The pumps at the Peabody mine in Grass Valley district were started again Thursday after being idle some two years. Messrs. Tregidgo & Co. propose to sink the shaft 800 feet deeper before drifting. It is now down 200 feet.

FEDERAL LOAN. — Nevada *Transcript*, Oct. 19: Supt. Vincent of the Federal Loan mine went to San Francisco Friday for a short stay. All of the hoisting and pumping machinery recently purchased from the New Constitution claim has been removed to the Federal Loan, and will be erected as fast as the weather will permit. The incline shaft is now down 160 feet, but is too small for practical working. It will be enlarged and sunk to a depth of 350 or 400 feet before any drifting is done. The ledge is large, the pay-chute long, and gold-bearing ore can be found at most any point where it has been opened. If this mine proves the success that is reasonably expected, it will lead to several other Willow Valley mines being extensively worked. Most former operations in that district have been of a desultory character.

CENTENNIAL.—Capt. Richards is down from the Centennial drift mine in Washington township. It has been definitely ascertained that the old shaft was half a mile north of the channel. A 50-foot cut has been run since the resumption of work this season, and the new tunnel into the south side of the ridge is now well started. This tunnel will, according to the estimates, bottom the center of the channel within a distance of 1200 feet, which can be run in about 12 months at an approximate cost of $5 a foot. The San Jose Co., on the same channel as the Centennial, have a fine prospect. They are now drifting toward the center of the channel, but will have to sink to get under it.

NORTH BANNER MINE. — Grass Valley *Union*, Oct. 18: The North Banner mine is developing finely. The ore vein is showing well in both the north and south drifts on the second level, and in the south drift the ore is now all of high grade. The ledge in the shaft, which is now being sunk below the No. 2 level, is also of first-class quality, and the vein solid and regular in formation. From the openings that have been made on the No. 2 level the ore shoot is found to be over 400 feet in length, which will afford a large quantity of backs when the No. 3 level is opened up. Above level No. 2 the ground was found somewhat broken, but now the vein is regular and the stringers are all making down to the foot-wall, with the promise of making a strong vein. The vein at present is 14 inches in size. The ore is highly mineralized with gold-bearing sulphurets, which will yield several hundred dollars to the ton, and besides will give paying results in free gold. Supt. Skewes says the mine has never looked as well as it does now, and there is no doubt that the ore body that is being opened up will prove extensive and valuable.

MACHINERY.—A large lot of machinery for the Idaho Co. is arriving by railroad, consisting of new fixtures for the concentrating department.

Placer.

GOLD RUN.—Placer *Republican*, Oct. 16: Moody's Bear Valley mine is being worked and will be continued until wet weather prevents. This property has paid immensely this year. J. R. Gayetty has leased his mine on Bear river to the San Francisco Development Co. at a figure that is very satisfactory to him. The Co. named are now at work on the mine and have great expectations.

Plumas.

THE HALLSTED.—Greenville *Bulletin*, Oct. 16: From Chas. Bressler, who is up from Rich Gulch, we learn that the Hallsted Bros. have just completed a crushing of ore from their mine there, and that it yielded them $6 per ton. The ore was taken from different levels. This mine has an immense ore vein, it being 12 feet wide. It runs into the side-hill of a deep canyon, thus making it possible to obtain backs 1600 feet. The property is so situated that water-power of practically unlimited extent can be introduced easily. With a large mill, this mine would become an important and valuable property.

San Diego.

PINACATE DISTRICT.—*San Diegan*, Oct. 18: Work in the newly located main shaft of the Good Hope mine at Perris has reached a depth of 135 feet, and a depth of 45 feet in a second shaft. It is the intention of the owners to sink the main shaft not less than 1000 feet and construct 200-foot levels. There are now 20 men at work in the mines and within five months it is anticipated that this number will be increased to 75. Some very fine ore has been taken out of the main shaft on the 100-foot level and the owners are very sanguine of success. Possessed of a good mining property, ample experience in mining property and backed by unlimited capital, there is no reason to doubt but that the Good Hope will loom up on the mining world as a "bonanza," and be the means of attracting capital and brains to the Pinacate district, and result in the opening of some splendid mining properties that are known to exist there. J. Everett Bird will superintend the Good Hope here, and James M. Sigafus, his partner, will in all probability return to New York City soon. In conversation with Mr. Bird, after the foregoing was written, he informed us in addition to the facts noted above, that he would in the course of a few months put up about a 30-stamp mill, but that they would do nothing until they had thoroughly developed the mine and knew their needs in the matter of machinery.

Sierra.

WIDE AWAKE.—*Mountain Messenger*, Oct. 19: The Wide Awake Co. struck through the lava last week, over 600 feet in their new tunnel. They have now slate rock in the face and gravel and boulders overhead, and they have about 160 feet to go to get the center of the channel.

LOGANVILLE.—The Marguerite mine is at present running full blast. The work of hoisting ore commenced last week, and now the mill is running its full capacity, 20 stamps. The pump is keeping the mine dry on four strokes a minute.

Siskiyou.

QUARTZ.—Yreka *Journal*, Oct. 23: Spencer & Co. of Humbug are now receiving a lot of machinery from below for pumping out water from their ledge and hoisting the quartz. The first installment arrived last week and was hauled to the mine from the Yreka depot last Friday. Boyle & Co. are having their steam engine and fixtures at Forks of Humbug hauled to their mine near the head of the north fork on the divide between the Humbug and Deadwood creeks, under supervision of John Burgess. Mr. Boyle is now at San Francisco securing a new quartz-mill of large capacity, with intention of having it delivered at the mine before the wagon-road from Yreka to Humbug gets too heavy from stormy weather to make hauling difficult. The miners at Hawkinsville feel hopeful of obtaining a supply of water this winter from Long and Canal gulches, not having been able to obtain any during the entire extraordinary dry season this time last year.

Yuba.

DRIFT MINERS PROSPERING.—Marysville *Democrat*, Oct. 17: John Dunn, from Smartsville Monday, gives a very encouraging account of the progress of drift mining in that good old town. The Blue Point Drift Gravel Mining Co. has at present 56 men employed, which, together with 40 employed by the Excelsior Mining Co., makes the number of men 96 who are earning good wages. We understand that Wheaton & Co. are about to open up a new claim at Mooney Flat and Smartsville which will give employment to about 400 persons.

QUARTZ.—Marysville *Appeal*, Oct. 18: For about a year there has been more or less activity in and around Brownsville on the prospecting quartz ledges of that vicinity, and the indications have been most favorable for some very rich finds. The miners who have been at work in the various locations are all old-timers in the business and they are very profuse in their talk concerning the richness of the specimens. Should any of the claims now being worked more as prospects than anything else, ever amount to anything, the people of that vicinity all expect to become wealthy and be surrounded by a large population. Among the claims now being worked is one known as the Howell, which has been in operation for nine months, during which time ten men have made 800 feet of drift tunnel and gone through 100 feet of ledge, taking out pay ore all the time. The rock in the nine months netted $4000. The men in this mine are now going through the second hundred feet of ledge, and the specimens are much more rich than in the first. The mill is a very small one, and used only by prospectors. There is some prospect of a large Eastern company taking hold of it. There are other claims in the vicinity known as the Colorado, Commonwealth, Emma and Ida mines, in which probably 25 or 30 men are employed in making tunnels and taking out rock, all of which is good pay. These mines are all under the superintendence of J. C. Campbell, who has great faith in their future. The Johnson claim, which is worked by the arastra process, has been taking out $15 of free gold to every ton.

Tulare.

AT WHITE RIVER.—Visalia *Times*, Oct. 17: The Bald Mountain mine at White River is not being worked very actively at present, on account of the lack of water with which to run the quartz-mill. Some ore is being taken from the mine and placed on the dump, and as soon as the winter rains furnish the necessary water, work will be pushed with vigor. The mill connected with the mine has sufficient capacity to crush 10 tons of rock per day, and the ore now on the dump, it is believed, will average from $25 to $30 a ton.

HARRIS & CO., who are working the Keyes mine near White River postoffice, have struck a very rich vein of ore at a depth of about 200 feet. The ore is the richest that has ever been found in that section, and one piece of it exhibited is actually wired together with gold. The proprietors are very reticent as to their find, but they have a very rich thing.

Tuolumne.

LEASED.—*Union-Democrat*, Oct. 19: Judge Stoner has leased his two pocket mines at Yankee Hill to Fred Greiner. These claims are situated near the pocket mine of Nate Arnold, from which large amounts of gold have been extracted in recent years.

BULLION.—The amount of gold taken from the Buchanan mine recently was brought to Sonora Sunday last, and sent to San Francisco the following morning. The bullion was estimated to be worth $25,000. The new machinery at the Black Oak has been put in place, and work was resumed this week with everything in fine order. The gold recently taken from the Bonanza mine, together with the sulphurets, will amount to about $85,000. We are informed from reliable sources that the Kanaka mine has been sold, and part of the purchase price paid down. The Mt. Jefferson mine near Groveland, owned by an English company, will be started up in November.

NEVADA.

Washoe District.

SIERRA NEVADA.—Virginia *Chronicle*, Oct. 19: On the 520 level from the main east drift, 1185 feet from the shaft station, a south drift is advanced 330 feet, continuing in a porphyry formation showing a slip of clay, which runs southeast and northwest from the course of the drift.

UNION CON.—On the 1465 level the north lateral drift is advanced 524 feet, from the south line, continuing in porphyry and clay.

MEXICAN.—On the 1465 level the north drift from west crosscut No. 1, 200 feet in from the lateral drift, is advanced 497 feet, continuing in porphyry and streaks of quartz.

OPHIR.—On the 1300 level the east crosscut from the shaft station, to connect with the top of the raise above the 1465 level east drift, is extended 233 feet, continuing in porphyry showing some quartz.

CON. CALIFORNIA & VIRGINIA.—The usual quantity and grade of ore is being extracted from the various openings on the 1435, 1500, 1600 levels. On the 1900 level where work was suspended in the south end of the mine Aug. 16th, have resumed operations and are extracting some milling ore from that point. On the 1650 level: The stopes on the seventh and eleventh floors above this level continue to yield the usual quantity of ore of fair quality. Also continue stoping ore from upraise No. 2, carried up above the north drift from the bottom of the winze 60 feet below the end of the south drift. During the week 1126 tons and 1980 pounds of ore were shipped to the Morgan mill, 1635 tons to the California. The average assay value of all the ore, worked at these mills during the week, according to battery samples, was $27.10. Bullion valued at $60,349.03 shipped to the Carson mint.

GOULD & CURRY.—On the 400 level west crosscut No. 1 is extended 410 feet. Formation hard porphyry. On the 1000 level the northwest drift is extended 336 feet. Formation hard porphyry.

SCORPION.—The 520 level south drift is out 263 feet and continues in porphyry.

SAVAGE.—Continue to extract ore of good quality from the 500 level north drift. A south drift has been started from the top of the raise above the 400 level.

HALE & NORCROSS.—West crosscut No. 1 on the 300 level continues in vein porphyry. No. 3 cut through 85 feet of low-grade quartz. West crosscut No. 2 on the 700 level continues in quartz. Fair grade ore is being stripped on the 1200 level. Retimbering the 1300 level station.

CHOLLAR.—Connection has been made with the Hale & Norcross workings on the 850 level. The 750 level north drift is out 570 feet and continues in porphyry.

POTOSI.—The 850 level south drift continues in hard porphyry.

NORTH GOULD & CURRY AND EAST BEST & BELCHER.—The northwest drift to connect with the North Gould & Curry workings has cut through a ten-inch streak of quartz.

IMPERIAL.—An east drift from the winze bottom below the 300 level to connect with the Imperial shaft is out 90 feet. The joint Confidence-Challenge 500 level north drift is out 1027 feet from the Yellow Jacket shaft.

WARD COMBINATION SHAFT.—Repairs in progress to the 1800 level shaft station.

ALPHA AND EXCHEQUER.—Underground explorations are temporarily suspended pending repairs to the joint hoist plant.

YELLOW JACKET.—Daily ore shipments average 50 tons. The Brunswick mill is crushing 100 tons daily from the reserves accumulated.

OVERMAN.—The south drift from the winze bottom continues in clay and quartz carrying fair grade ore.

CROWN POINT.—The 700 level south drift is out 490 feet. The 900 level west crosscut is showing four feet of fair grade ore. Are raising above the 600 level for ventilation.

BELCHER.—No. 2 east crosscut on the 1200 level is in porphyry. The 1000 level east crosscut is in porphyry and quartz.

SEG. BELCHER.—The 1100 level east crosscut is in 398 feet, and is in clay and porphyry.

SILVER HILL.—The 160 level northeast crosscut continues in quartz and porphyry. The 260 level level northwest drift continues in porphyry.

JUSTICE.—Crushed 232 tons of ore showing an assay value of $25.90 per ton.

ALTA.—Crushed 320 tons of ore, assay showing a value of $33.75 per ton. The 825 and 925 level stopes continue to improve in the quality of the ore.

NEW YORK CON.—Ore still showing in the raise above the 800 level west crosscut.

EAST SIERRA NEVADA.—The 520 level south drift is out 140 feet and continues in porphyry.

UTAH.—On the 600 level the southeast drift is advanced 90 feet from the shaft station. Formation hard porphyry.

OCCIDENTAL CON.—During the week extracted and milled 300 tons of ore, showing an average assay value of $21.10 per ton.

NORTH OCCIDENTAL. — Continue stoping ore from the 450 level and raising above the 350 level to connect with the 300.

Barbee District.

GOLDEN JACKET MINE.—*Silver State*, Oct. 18: Work is being resumed on the Golden Jacket mine in the Humboldt range. If the powers that be at Washington would embrace the present favorable opportunity to increase the coinage of silver dollars, thereby creating a demand for bullion, many mining camps now deserted would be revivified.

Eureka District.

A MINING SALE. — *Sentinel*, Oct. 19: Ten months ago Mr. Cassidy of this paper undertook the sale of the Diamond mine on Prospect Mountain, for its owners. He made a contract with Richard MacIntosh, of Salt Lake, for $60,000, certain work to be performed by Mr. MacIntosh. The whole business was finally consummated the past week, and Mr. MacIntosh paid out $75,000 in cash for the Diamond and Antelope properties. This is the best sale that has been made in Eureka for 20 years. It is new blood and means new life and business for the camp. The Diamond promises to be a great property. It is not fully developed as yet. We are to have a sampling-mill here by the Salt Lake parties, and this, together with the new cheap transportation rate, will make Eureka the best camp in the State next year. The Smelting Trust is "busted" and all things are once more bright for the Base Range. The parties receiving the money from the sale were Dan H. Foley, $30,000; Dennis O'Leary, $15,000; Morris Bros., $15,000; Pat Finnegan, $15,000. In addition to the purchase money Mr. MacIntosh has spent about $25,000 in developments, so, in round numbers, the deal represents about $100,000 of cash money to the camp.

NEW ORE RATES.—The new ore rates for transportation of ores to Salt Lake and San Francisco, went into effect last Wednesday, since when 11 carloads have been shipped as follows: From the Eureka tunnel, 20 tons; Williams mine, 12 tons; White Pine, 25 tons; and Morey, 21 tons. There are also 15 tons left at the depot from White Pine awaiting shipment. The rates will be of immense benefit to the outside districts where there are thousands of tons of low-grade ore on the dumps that can now be shipped with profit. There is new encouragement for prospectors, and we may reasonably expect a booming camp again.

Golconda District.

COPPER.—*Silver State*, Oct. 17: The Adelaide copper mine, near Golconda, is being thoroughly prospected. A drift has been run 100 feet on the 110-foot level. It is in ore all the way. Some of this ore yields 20 per cent copper and 34 ounces of silver to the ton. A drift will shortly be started south on the 110-foot level to prospect the lead in that direction. The Great Republic and New Star Con. Co. is prospecting one of their mines by shaft. They will ship two carloads of the ore to be reduced as soon as teams can haul it to the railroad.

Pioche District.

THE RAYMOND.—*Record*, Oct. 16: At the Raymond shaft the work of opening up the Black Ledge continues. The 1500-foot winze station on the 12th level is now nearly wholly recovered. The station is 30 feet long, 15 feet wide and 25 feet high. The engine which was stationed over the winze is being overhauled at the machine-shop, and will soon be ready to put in place again. When the station caved, heavy timbers fell across the mouth of the winze and no great amount of dirt seems to have gone down it. The water is clear as crystal and the winze as far as can be seen is in good shape. The old stope through which access to the Black Ledge was had some weeks ago has been repaired, and an upraise is being run on the Black Ledge. At this place the ledge is five feet in width, carrying two feet of 100-ounce ore; the balance of the vein is not worth saving. The upraise will eventually be connected with a winze from the 10th level. On this level work on the ledge also continues, the ore taken out averaging 202 ounces. The ground between these two levels is unexplored and present appearances indicate that it will produce thousands of tons of high-grade ore.

ZERO.—This is the name of the claim owned by the P. C. Co. on the iron or manganese ledge running southerly from the Raymond works over the divide, and which is being prospected by a tunnel run on a level with and at a point about 100 feet east of the works. The tunnel is now in some 200 feet, and the result is very encouraging. As reported several weeks ago, the ledge was cut about 100 feet from the face of the tunnel, from which point it was run south along the ledge for 100 feet or more. The ledge averages three feet in width, with a paying streak of 23-ounce ore running through it. Such ore as is in the way is taken out in drifting and stored in the Raymond ore bins. The tunnel will be continued until it reaches

an old prospect shaft which is on the ledge about 300 feet up the hill, at which point the ledge averages 40 ounces in silver. The extraction of ore will then properly begin and another feeder of the smelter turned loose.

Robinson District.

GOLD, White Pine *News*, Oct. 19: Since the last report published in the *News* of the Joanna bonanza, its fame has spread far and wide. For the information of all we can truthfully say that its merits have not been exaggerated. Mr. Watson is now quietly quarrying out the mountain-side and working it at the Ely mill, leaving the rich ore in the drifts to be disposed of hereafter, perhaps by a more saving process. A few days ago he scraped the plates at the mill and brought down-town and showed us a pan of amalgam weighing six pounds nine ounces. That there are many other mines in Robinson district equally as promising as the Joanna, all the indications of similar formations go to prove. The Joanna No. 2, which adjoins the Joanna on the west, and upon which the owners, Messrs. Watson, House, Larsen and Ostergard, have been doing prospecting work, bids fair to rival its sister to the east. They have run a drift north, out into the canyon, with good prospects. To tap this drift, they went out in the flat 100 feet and sunk a shaft. In doing so they found more or less gold in the gravel. At a depth of 30 feet the water came in on them so strong that they could not handle it and will have to wait till a pump is put in. They believe that when they reach bedrock they will find a rich deposit of gold there, and later cut down into the ledge, which they believe crosses the canyon.

Silver King District.

SUSPENDED. - White Pine *News*, Oct. 19: Work at Silver King district has been suspended for this season, and John S. Wheatley and family have gone to Pioche.

Tuscarora District.

BELLE ISLE.—*Times-Review*, Oct. 16: West crosscut, 250-foot level, extended 13 feet; the face is in vein matter.

NAVAJO.—Men have been put in the old stopes, which look fair. About 40 tons of first-class ore have been hoisted and sent to the ore-house.

NORTH BELLE ISLE.—The shaft has been sunk and timbered 11 feet; total, below the 400-foot level, 159 feet. The rock continues very hard. The concentrator is running well and doing excellent work.

NORTH COMMONWEALTH.—During the week a carpenter-shop 16x30 feet has been erected. Joint crosscut, 225-foot level, extended 14 feet; the face is looking very well. South drift from the joint crosscut, 225-foot level, shows the ore much higher grade.

DEL MONTE.—Joint crosscut, 225-foot level, extended 14 feet; the face is looking very well. East crosscut No. 1 from north drift, same level, extended 10 feet; the face is looking favorable for ore. No. 2 east crosscut, 100-foot level, extended 12 feet; the face continues to intersect strata of high-grade ore.

GRAND PRIZE.—400-foot level: Winze in the east drift from the north crosscut has been sunk nine feet. Ore is improving in size as depth is attained. Concentrator is nearly completed, and will start up during the coming week.

COMMONWEALTH.—100-foot level: North drift has been advanced 17 feet; total distance from turntable, 206 feet; face of drift is in the vein. East crosscut from north drift extended 19 feet; continues to show good ore in face. 150-foot level: South drift from No. 1 east crosscut has been started and run 11 feet in low-grade ore, assaying $12 to $62 per ton. 300-foot level: North gangway has been advanced 17 feet; rock is breaking better. No work being done in any of the stopes.

Tybo District.

DIMICK.—White Pine *News*, Oct. 19: The Dimick mine, which is part of the estate of the late Eugene N. Robinson, is reported to be looking fine and yielding large quantities of ore of high grade.

Wild Rose District.

THE PARADISE VALLEY.—*Silver State*, Oct. 16: Nick Frayer, from Spring City, says the ore body in the Wild Goose is the largest ever found in the Paradise Valley Co.'s mines. It is fully 25 feet wide and averages $40 to the ton. There are thousands of tons of ore in sight.

ARIZONA.

TURKEY CREEK.—Prescott *Courier*, Oct. 16: Turkey Creek district maintains its old reputation for the richness of its ores. It was in this district that Morgan & Gavin found the Pine Spring chimney which yielded between $20,000 and $30,000 in less than a month from the time it was struck. This was in silver. The Old Bully Bueno furnished a great many tons of rich gold ore. The richest known ore now in the district is coming out of the Mulvenon & Roach mine, on the Goodwin lode. Two industrious miners, Messrs. Fitzgerald and O'Neill, are working it under lease from Mulvenon and Roach, and have a 12-inch stratum of ore that averages 800 ounces of silver to the ton. A piece of the ore contains silver of the value of 1000 ounces per ton. John Holmes continues to hoist very rich ore from his mine. The district is about 18 miles south of Prescott, is well timbered and watered, with a climate which for 9½ months of the year cannot be excelled for mildness and healthfulness. The gold ledge recently discovered in French Gulch by Messrs. Hagadorn and Dolph is attracting attention, on account of its size. Should it maintain size and richness, great things may be expected of it. The company that is operating in Big Bug district have several men engaged constructing houses for their men, and sheds over hoists, etc. The management was never excelled in Arizona. We still look to this company to erect and run such reduction works as are needed in several places in this county. It will encourage poor miners throughout this section to be told that not in 20 years have so many agents of capitalists been here looking for good properties. Their examinations will lead to a good many sales and more active working of mines.

COLORADO.

NOT A SUCCESS.—Elk Mountain *Pilot*, Oct. 17: The Augusta mine and concentrator have been shut down tight for the winter. The running of the mine seemed to depend on the success of the concentrator, and as that was not a success to start with, the entire work was shut off. In order to make the concentrator a success, new machinery will have to be put in at an outlay of several thousand dollars. Work has been stopped on the Excelsior mine in Poverty gulch for the winter, we suppose. As the developments on this mine were proving satisfactory, we supposed the work would be continued all winter. Old Poverty gulch will be about deserted again this winter as usual. The Sunset mine, situated up the Maroon gulch on the road between here and Aspen, has been sold to a company known as the Aspen United M. & M. Co., with George Lloyd as superintendent. An attempt will be made to list it on the Denver mining exchange. It is a galena ore, not running high in silver. The Jenny Lind mine is shipping a carload of ore this week. We believe this mine will shut down for the winter. It would be interesting for the owners as well as for the country if they could see their way clear to work a small force all winter. The Runnoe Bros. are working their mining property on Galena mountain. A report reaches us that good ore was struck last Saturday in the Excelsior mine, situated on Sheep mountain. It belongs to C. J. S. Hoover, and is being worked by Tom Boughton and Art Edgerton. It is very close to the Black Queen mine, which has recently jumped into prominence as a rich producer.

KITTY CLYDE.—Idaho Springs *News*, Oct. 19: The Kitty Clyde stamp-mill in Spring gulch is to be started up. The ore-bins are full of ore from the mine, which gives steady employment to a number of men.

THE PENNSYLVANIA M. CO., with L. Sternberger as manager, is doing some great work in the vicinity of York gulch and Fall river. The Jumbo mine near the head of York gulch is supplied with a good substantial ore-house, having a hoisting plant which renders excellent service, and other improvements. The shaft is now down 100 feet, and sinking on a vein of smelting ore, slightly scattered, is going on night and day. On Fall river, beyond the mouth of York gulch, work on the Pennsylvania crosscut tunnel is being pushed vigorously. It will be a great success. The outlook for this company is certainly bright and promising.

DAKOTA.

GALENA PYRITES.—Deadwood *Pioneer*, Oct. 16: It is anticipated that the Iron Hill smelter will be blown in again shortly. Preparations looking thereto, such as obtaining a quantity of pyrites, have been under way some time. Most of the pyrites used for the last run were taken from the Alexander and Emma mines, Galena, whence supply for the next run will also be furnished. Several shipments have been made during the week, the last lot, four wagon-loads, going to Carbonate on Friday.

NOT IDLE.—Though mining stocks have been dull for the past two months, and brokers have in consequence paid them considerably less attention than they have county and city securities, the mines have not been idle. Individual and corporation owners of good claims have been steadily developing their properties. This is true at Bald Mountain, Ruby Basin, Carbonate, Galena, Strawberry, Two Bit and other places contiguous to Deadwood. The result is that when activity again asserts itself and stocks boom once more, they will do so on a more substantial basis than formerly. Purchasers will realize when buying that they are getting an interest in a pretty good mine, or one that prospects well, and gives promise of becoming a large producer.

PREPARING FOR WORK.—Deadwood *Pioneer*, Oct. 16: Col. Carpenter, lessee of the Deadwood Reduction Works, yesterday visited the site of the old building for purpose of informing himself what material thereat may be used for the new structure. Roasters, engine and perhaps the boilers will come into play. Work will begin, under management of a competent superintendent, on Monday of next week.

GOLDEN REWARD.—The Golden Reward Co. has determined to hasten its shipments of ore to Omaha. All available transportation has been secured from the Northwestern, and what remains of the 3000 tons of ore at the reduction works site will be sent forward as quickly as possible. Returns have been received from the first six carloads shipped, and were entirely satisfactory to the company.

CHLORINATION WORKS.—The Harmony M. Co. continues operating Keith's Keystone Chlorination Works with satisfactory results. The percentage of loss is nominal, tailings of $40 ore not assaying to exceed $3 per ton.

IDAHO.

CUSTER.—Challis *Messenger*, Oct. 19: We arrived in Custer in the early evening and made two brief halts, one at the express office and the other at the postoffice, not long enough to learn anything; but we returned and have looked the town over, and Custer is beginning to move, is on the point of a boom that looks wedge-shaped and it is hard to tell at the present writing just how big the other end will be. The Dickens-Custer Co. complications have been settled, and the mill is dropping, as of yore and with old-time regularity, her 30 stamps upon the rich ores of the Lucky Boy mine. A new 20-stamp mill, as fine as modern ingenuity can construct, is being erected upon the Fourth of July mine, and the mines and prospects, old and new, adjacent to the camp, never showed such bodies of ore well defined at depth as they do at the present time. The old business houses are about all occupied again—their occupants doing a good business—and a number of new houses are being erected.

THE GOLD BELT.—Wood River *Times*, Oct. 16: The news from the Gold Belt is most encouraging. The Camas No. 2 people recently cut into an extensive body of rich ore on their lower level, and, the water supply being now ample, will start up their mill in a few days, and run it to its full capacity. The Huntington mill to be put in by the Tip top people will demonstrate that the ore will pay, even if, owing to its small capacity, it does not realize much profit for its owners. The improvement is very slow in coming; but it is evident that only a short time must now elapse ere the Gold Belt is taken hold of by parties who will have ample means to develop it.

ATLANTA.—Wood River *Times*, Oct. 16: G. A. Williams, who returned last Saturday from a visit to Atlanta, where he went to witness the practical working of the new riffled Frue vanning tables, says that they are an undoubted success and seem likely to bring out that long-neglected but exceedingly meritorious district. The vanner seems to be just what was needed to work the low-grade ores of the district—for Atlanta was exploited in just the same way that Wood River has been, to wit: The high-grade ore was extracted, while the low-grade rock was left in place; but as there are mountains of the latter, if a cheap process can be found the camp will prosper as it never has before, and give permanent employment to thousands of men. The concentrating test made at the Buffalo and Tehoma mills having demonstrated the excellence of the new vanner, the above companies have concluded to greatly increase the crushing capacity of their mills. The Buffalo Co.'s mill is of 10 stamps, but 15 additional stamps have been ordered; the Tehoma mill is also of 10 stamps, but 20 additional stamps have been ordered. These, together with a sufficient number of vanners to concentrate the pulp—one vanner putting through 8¼ tons per day—will be put in as soon as possible in the spring, and from that time thenceforth Atlanta will put on new life.

BLACKBURN DISTRICT.—Wood River *Times*, Oct. 16: James Cassady, a prospector who has lived in Blackburn district since 1881, reports the district very dull since the shutting down of the Viola Co.'s smelting works at Nicholia, as that was formerly the market for the claim-owners of the district, and they are now compelled to either haul their ore to Blackfoot and ship it on their own account, trusting to entire strangers and waiting a month or more for returns, or haul it to Hailey, which is 90 to 100 miles away. The ores of the district being generally of low grade, they cannot pay the heavy expense which this necessarily involves. This season the Bob Ingersoll was about the only claim that shipped in any quantity, the ore being of fair grade. The Hidden Treasure has also yielded small lots of shipping ore. On Badger creek, about 10 miles farther, there are large bodies of sand carbonates which are being developed. One of the groups there—the Triumph, owned by C. Bunting, Chas. Thum and others—is opening up very encouragingly. Six men are employed.

YREKA DISTRICT. — Wardner *News*, Oct. 19: The group of mines on Elk and Deer creeks, belonging to the Alma & Nellie Wood Co., have yielded rich returns, and at present are being worked to the entire satisfaction of the owners. The upper tunnel, or what is known as Tunnel No. 1, on the Nellie Wood, is in 825 feet; from there an upraise has been made containing man-way, ore chutes and waste chutes to a level 65 feet higher, which level has been extended 100 feet on the vein, showing an average width of 2½ feet of good milling ore. Above this level a large amount of stoping is in progress, yielding a supply of ore to keep 15 stamps running regularly. Tunnel No. 1, in its eastern course, gains a depth of 500 feet before reaching the in-line of the claim, consequently it has been found necessary to open levels, 70 feet apart, between this tunnel and the surface, in order to facilitate the development of the mine and to make the extraction of ore easy and convenient. Tunnel No. 2 has been extended 750 feet, and the vein stoped out up to Tunnel No. 1. This is the lowest working from the surface on the mines. On the west side of Elk creek, on the Alpharetta, Hawkeye and Alma claims, about 2000 feet of development work has been done, consisting of tunnels and upraises, from which large quantities of ore have been stoped and reduced in the mill. At present 30 men are employed, and work has progressed with regularity for the past seven months, under the superintendence of James Cronin. Thomas Sorden has charge of the mill.

MILO GULCH.—A carload of machinery arrived last week for the Bunker Hill & Sullivan mines. It consists of a complete hoisting plant. The hoist will be used for the connection between the Reed, or lowest tunnel, and the workings above. A large-sized blower, for supplying air in extending the Reed tunnel, and a Blake steam plunger-pump to handle the influx of water in some of the lower workings, were also received.

THE HUNTINGTON MILL.—The Huntington Centrifugal Roller Quartz-mill, which has been so successful in the treatment of ores in California, is attaining much popularity in the Territories. The plant in use at the Fay Templeton mine on Pony gulch is doing good service, and is working both economically and satisfactorily. A 20-ton mill, of the Huntington make, has been ordered to test the ores of the Tip-Top mine in the Wood river country.

LOWER CALIFORNIA.

ANOTHER BRICK OF GOLD.—San Diego *Sun*, Oct. 16: The steamer Dublan yesterday brought up L. B. Howard of the Occidental Mining Co., of Real del Castillo, who was making his regular visit to San Diego with the output of the mine and mill. The present brick is valued at $3000, and is the clean-up of a 15 days' run on 190 tons of ore from the mine. This makes $6000 which Mr. Howard has brought up in the last 18 days, and over $15,000 in the last three months. All of this is the output of the Occidental mine, owned by Messrs. Dare, Collins and Howard. At present the company are working about 40 men. Their shaft is down 200 feet from the top of the hill and in a large vein of good ore. It is Mr. Howard's intention to begin the construction of a 500-foot tunnel running into the side of the hill, which, it is supposed, will strike the ore vein about 300 feet below the bottom of the present shaft. This tunnel will largely decrease the cost of mining, as none of the ore will have to be lifted.

MONTANA.

AT CABLE.—Anaconda *Review*, Oct. 19: This prosperous camp is in a chronic state of push and progress. On every hand are indications of prosperity and enterprise. The Cable mill is running 30 stamps on first-class ore, and there is every indication that this run can be maintained. The Red Lion is running full capacity, and with the brightest of prospects. Salton Cameron's new mill is slowly assuming shape, and will of course add materially to the resources of the camp. As soon as completed the mill will be run on ore from the Southern Cross, which is showing up better and better as work advances. A large amount of ore is in sight, and the mill will be run to its fullest capacity. The Pyrenees mine has shut down, and will probably not resume operations till spring. The prospects of the camp are very bright, and the coming season bids fair to be a busy and successful one.

THE KEYSTONE.—A new mining company has been incorporated under the laws of Montana for operating in the Oro Fino district, one and one-half miles east of Champion. The company is named the Keystone Mining Co. The principal claim of the new company is the Washington mine, upon which development work is being done with favorable results. The vein is of silver ore in a granite formation, running from four ounces to 160. The vein is from four and one-half to five feet wide between well-defined granite walls. The company is now sinking a two-compartment shaft about 55 feet east of discovery, to top lead at 300 feet depth. The work is now down 65 feet. A fine hoist is in position for working to a depth of 350 feet. If when the main lead is tapped at 300 feet, the mine will justify, it is the intention of the management to erect a 40-stamp mill and push the work of development.

ANACONDA.—*Inter-Mountain*, Oct. 16: Some little difficulty is being experienced on the upper level of this mine for want of better ventilation. The heat is so intense that a miner is compelled to wear extra light clothes. The heat comes from the large number of timbers that are used to stay the ground. There is a larger body of ore on the 1000 than any level in the mine. The lead is between 15 and 16 posts wide, and yet no sign of either wall has appeared. Crosscutting and drifting are in progress, but as yet no stoping is or has been done on this level. All of the stations and some of the drifts are illuminated by electricity, it being much safer and giving a much better light under ground than the old style of numerous candles stuck around in many places, or of the coal-oil lamps hung in the center of the station. Work on the 300-foot level is confined to the first floor, and a raise is being put through to the 200 from this level. Much ore is yet to be taken out. The connection between this mine and the St. Lawrence has just been made on the 300 of the Anaconda with the 100 of the St. Lawrence. There are also connections between the two mines as follows: Four hundred with the 200 of the St. Lawrence, 500 with 300, 600 with that of the 400, 700 with the 500, 800 with the 600, and from thence down no connections are yet made, though drifts are being actively extended. Sinking continues in the St. Lawrence, and it is now down about to the 800. When the sinking has been completed to the 1000 of the St. Lawrence, connections will be made with all drifts of the Anaconda down to its depth. The St. Lawrence after reaching the 1000 will be 200 feet deeper than the Anaconda, there being that much of a difference on the surface.

NEW MEXICO.

THE MCGREGOR.—*Southwest Sentinel*, Oct. 18: John Spiller has commenced to operate the McGregor mine at Georgetown on the leasing system. Ten men are at work taking out ore, the higher grades of which will be shipped and the lower grades will not be worked until next spring, when the Mimbres company's mill will be started up.

KINGSTON.—Cor. Silver City *Enterprise*, Oct. 16: The Templar is now working on ore, with M. Lynch as foreman. It was reported worked out; one naturally suspects stock manipulation in a case of this kind. The Virginian, adjoining on the south, under lease to Judge Holt, is continually taking out ore, with a force of 15 to 20 men, and grows better and better; while the Keystone, next adjoining, has been taking out ore the past month. The celebrated Grey Eagle property is now advertised for sale under deed of trust. This, it is supposed, will finish the complications on the Grey Eagle, and that after the first of the year, ore will again be rattling down the rough south Percha road on its way to the smelters. Some leasers have been taking out ore for several months. On the north end of the belt, the Ingersoll, which has always produced ore, and is owned and controlled by Las Vegas parties, is advertised for lease and bond. This mine, like many others, needs capital. The Comstock leasers still go on taking out ore. M. G. Barton, the general manager, has gone East to look after several carloads of ore. The Lady Franklin just now is doing nothing but pumping the water out of the mine, except what the leasers are doing. Wages were reduced to $3 per day, by orders from London, and the men at work stopped. The leasers are taking out large amounts of ore, as usual. Buck & Daniels are still working successfully on their Iron King lease, and taking out ore. The Brush Heap group and Illinois are still the steady producers. The Iron Clad tunnel is in about 80 feet.

UTAH.

MINERAL IN UINTAH COUNTY.—Wasatch *Wave*, Oct. 16: Mr. S. B. Moore of Provo has recently returned from a prospecting trip into Uintah county. He went through Strawberry and over the spur of the Wasatch range which controls the connection with the Uintah range. He found a belt of iron, inexhaustible, carrying precious metals of gold and silver. This lies on the Uintah reservation, just over the belt of the Wasatch range. He has also discovered other claims on the reservation, and wants the Government to open this country, as he has found precious metals all the way through, but cannot develop them unless Congress will throw the land open to the public.

BINGHAM MINING NOTES.—Salt Lake *Advertiser*, Oct. 18: There is increased activity in Bingham camp this fall, and the outlook for an increased output from the rich mines there is assured. The lead mine is running night and day, and is worked to its fullest capacity. It sends out 55 tons of concentrates daily. The ore is brought from the Brooklyn and Lead mines, five and 6½ miles from the mill. This mill alone employs 15 men. The owners of the Brooklyn and Lead mines are expending a large sum in improving their tramway to the lead mill. The Lead mine is down about 900 feet, and the vein appears to be inexhaustible, while improved machinery is being put in the Brooklyn mine. The Highland is down 175 feet, and has a daily output of about 10 tons of steel galena, worth $20 to $25 per ton. This ore is raised by means of a windlass. The future output of this mine looks so encouraging that the company is thinking of putting in steam hoisting works. New pumps and other machinery are being put in the old Yosemite mine by the owners, Messrs. G. M. Scott, and Remmington, Johnson & Co. of Salt Lake City.

MECHANICAL PROGRESS.

An Important Contribution to Metallurgical Science.

At a late meeting of the British Association, Mr. Wm. Anderson, president of the mechanical section of the association, as reported by the English correspondent of the *American Manufacturer*, contributed a most suggestive and practical paper upon the molecular structure of matter in connection with engineering—which paper has attracted much interest among English metallurgists.

The Modern Engineer and His Materials.

The progress of engineering, Mr. Anderson very truly said, is rapidly coming to depend upon more exact methods of utilizing the properties of materials and upon a more thorough understanding of the laws by which those properties are defined. He does a service equally to engineers and to metallurgists who suggests some new means of meeting this growing requirement. His address was a remarkable demonstration of the truth that as science advances and discoveries multiply, the line between practice and theory, once so hard and fast, is rapidly melting away.

Molecular Action in Iron and Steel.

I will not follow Mr. Anderson through the brilliant periods in which he described the molecular constitution of matter and laid down the main laws of its action. He based his references of molecular action of iron and steel upon the hypotheses that molecular motion pervades matter in all its forms, and that the solid passes, often insensibly, into the fluid or even direct into the gaseous. It follows, almost of necessity, that there must be a borderland, the limits of which are determined by temperature and pressure, in which substances are constantly changing from one state to another. Mr. Anderson deals with metallurgical processes from the standpoint of one who sees in them the manifestations of this phase of molecular action.

The Hardening of Steel.

Thus, if steel be looked upon as a solution of carbon and iron, then the hardening of steel is explained by the theory that dissociation has taken place at the temperature at which it is suddenly cooled. That is, the sudden cooling fixes the molecular motion at such an amplitude or phase that it gives a characteristic structure, one of the properties of which is extreme hardness.

The Treatment of Alloys.

That steel, and probably other alloys, differ in the nature of their composition according to the way in which they are worked, both with respect to heat and mechanical pressure, has been abundantly proved. It would appear as a natural sequence that the properties of steel would be greatly affected by the manner in which its temperature was changed. Indeed, we find that steel is thus affected when these changes are produced by baths of melted metals, by oil, or by water at different temperatures. Practically metallurgists are applying these principles at random. The value of steel rests with the temperature at which it is suddenly cooled, yet no precise law has been discovered to apply to the process.

The Importance of Small Changes.

One thing Mr. Anderson insists on vigorously—the immense effects produced by what would be considered "little" changes. It is not so very long ago that any one would have been considered a dreamer for propounding a theory that the presence of the fraction of a per cent of carbon, phosphorus, or sulphur would totally alter the character of iron; that the addition of one or two thousandths part of aluminum to molten iron would make the pasty mass as fluid as water; that the presence of the smallest impurity in copper would have a disastrous effect upon the metal's powers of conducting electricity; and that the addition of one-thousandth part of antimony would convert the "best selected" copper into the worst conceivable.

A Valuable Metallurgical Deduction.

From the various instances of molecular action which have been collected one law has been deduced—the Periodic Law of Dr. Mendeleef. According to that law, the elements, arranged in the order of their atomic weights, exhibit an evident periodicity of properties; and, as Prof. Carnelly has observed, the properties of the compounds of the elements are a periodic function of the atomic weights of their constituent elements. Acting on these views, Prof. Roberts Austin has recently devoted much time and labor to testing their exactness with reference to the mechanical properties of metals. In view of the difficulty of obtaining other metals of sufficient purity, he selected gold as his base. In a communication to the Royal Society made last year he shows that the metals alloyed with gold which diminish its tenacity and extensibility have high atomic volumes, while those which increase those properties have either the same atomic volumes as gold or have lower ones.

A New Era in Metallurgy.

The inquiry has only just commenced, but it seems to Mr. Anderson to promise ultimate results which will prove as important to the engineer and as fruitful of progress as the great generalization of Mendeleef has already been to chemists. A law which cannot only indicate the existence of unknown elements, but which can also define their properties before they are discovered, if capable of application to metallurgy, must surely yield most valuable results. It will render the compounding of alloys a scientific process instead of the lawless and haphazard operation which it is now.

Effects of Mr. Anderson's Theories.

It will be seen that Mr. Anderson has most thoroughly practical ends in his view in his scientific investigations. His theory of molecular action explains, as the result of external stresses, many of the metallurgical eccentricities which are the abiding problems of engineers. The application of heat will cause a change of volume, and, at last, a change of condition; the application of external stresses, he tells us, will also produce a change of volume. The most tenacious metals have high melting points.

"The Fatigue of Substances."

This is the phrase in which is described the permanent changes of form produced by long-continued stresses or stresses frequently applied. Stretched beyond their elastic limits—which limits Mr. Anderson does not suppose to exist except when stresses are applied quickly—substances are permanently deformed. The same effects follow the long application of heat.

The Explanation of Mysterious Metal Failures.

The constant recurrence of stresses, even those within the elastic limit, causes changes in the arrangement of the particles of substances which slowly alter the properties of the latter, and in this way pieces of machinery, which theoretically are abundantly strong for the work they have to perform, fail after a more or less extended period of time. The effect is intensified if the stresses are applied suddenly, if they reach nearly to the elastic limit, and if they are imposed in two or more directions at once. In these cases the molecular disturbance becomes very intense, the internal equilibrium is upset, and a tendency to rupture follows.

A Whole Series of Such Cases.

Such cases occur in artillery, in armor plates, and in parts of machinery subject to impact. As might be expected, the destructive effects do not always appear at once, but often after long periods of time. When considerable masses of metal have to be manipulated by forging, or by pressure in a heated condition, the subsequent cooling of the mass imposes restrictions on the free movement of some, if not all, of the particles. Internal stresses are developed; they slowly assert themselves, and often cause unexpected failures. Considering the frequency of these accidents, it is satisfactory to know that not only Mr. Anderson, but Capt. Noble of the Elswick Works, and Lieut. Crozier of the United States Artillery are making such investigations into the subject of stresses in metals as will probably lead to much greater attention being paid in the future to the principles upon which the annealing and hardening of steel is carried on.

Another Singular Cause of Failure.

Mr. Anderson attributes a good deal of influence upon the quality of steel to the efflux of time. The highest qualities of tool steel are kept in stock for a considerable period. It seems certain that bayonets, swords and guns are liable to suffer in this way.

Wanted!—A Newton.

"I have now laid before you," said Mr. Anderson at the close of his address before the British Association, "the views respecting the constitution of matter which I think are gaining ground, which explain many phenomena with which we are familiar, and which will serve as guides in our treatment of metals, and especially of alloys. But I must admit that the subject is still by no means clear. A great deal more definition is wanted. We are still awaiting the advent of a man who shall do for molecular physics what Newton did for astronomy in explaining the structure of the universe." There are those who will see in the laborious investigation and clear-sighted intelligence of Mr. Anderson himself qualifications for even so high a destiny as this.

ENGRAVING BY ELECTRICITY.—The French Academy of Science has received communications on a process of engraving on glass and crystal by electricity. The plate to be engraved is covered with a concentrated solution of nitrate of potash and put in connection with one of the poles of the battery, and the design is traced out with a fine platinum point connected with the other pole. By this process it is claimed that marvelously delicate work can be done.

IMPORTANT EXPERIMENTS connected with the coal consumption of locomotive boilers are being conducted by Mr. D. Drummond, the engineer of the Caledonian Railway Company. For some time past he has had engines running between Carlisle and Aberdeen at high pressure, and careful data have been taken in order to ascertain the relative value of coal consumed in the same boilers working at different pressures.

DURABILITY OF STEEL RAILS.—A commission representing the various German railway companies has published a report detailing the results of observations made during six years on the durability of steel rails on German, Austrian, Hungarian, Dutch and Belgian lines. It appears that the duration of a steel rail may be reckoned on an average at 35 years.

SCIENTIFIC PROGRESS.

What Is Color?

A correspondent of the *Manufacturer and Builder* calls attention to the following facts which will be of interest to many who are just now asking themselves the question: "What is color?"

All visible matter acts on light in some manner, and all objects except black ones send off light of some hue, and all light produces sensation in the normal eye. The term "color" has been applied to the sensation and to the light by which the sensation is produced; but the word is used chiefly in describing a certain appearance of objects, and for this purpose black and white are as necessary, and hence as legitimate, as any other words.

But this communication is intended to deal only with the cause of the difference in appearance (color) of different objects. On what does their color (in daylight) depend? Is it on the kind of matter of which they are composed, or on some condition of such matter? It may depend partly on kind, yet the instances in which color changes with change in condition are so numerous that they suggest the idea that every kind of matter may possibly assume more than one hue.

Beginning with simple, or elementary, matter, we find that carbon, in the form of the diamond, is transparent, is a grayish-white as diamond-dust, but black in the form of coal or lamp-black. Phosphorus is yellow or brown, according to its condition; and sulphur is light yellow, dark yellow, orange or brown. Mercury, in the form in which it is usually seen, is light-colored and brilliant, but is a dingy blue when finely divided. Gold, in its native state, is yellow, but on precipitation becomes brown. When used in gilding it sometimes assumes a reddish tint; and Smee says that he has seen this metal of every color. Copper and titanium are usually red, and most metals are light-colored; yet all of them are invariably black when rapidly separated from weak solutions by means of a comparatively strong electric current. Silver electrically deposited on a cast of mother-of-pearl has the same colors as the pearl itself, and evidently because the silver has the same shape of surface, or topography, so to speak. Right here it may be remarked that the different colors of the pearl are not owing to different kinds of matter in different parts of the shell, because any given spot will show different colors when viewed at various angles.

Compound substances afford many examples of change in color merely by change in condition. Transparent and "colorless" substances, in general, like glass, quartz, ice, etc., become white when pulverized; and highly-colored crystals, like copper sulphate and potassium bichromate, are much lighter in color when reduced to powder. Indeed, the latter changes from red to orange. A more striking change may be noted in chloride of cobalt. This compound, in crystals, is a garnet-red, but it assumes a decided blue when a thinly-spread of weak solution is dried. In one condition sulphide of mercury is black; in another it is a brilliant red. Iodide of mercury, at the instant of formation, is a light yellow; but it rapidly changes to a brilliant scarlet. The action of iodine on silver is most interesting. If a small piece of solid iodine be held about a sixteenth of an inch above a piece of clean silver in a still atmosphere, the silver directly under the iodine will soon become violet, then it will slowly show all the colors of the spectrum in concentric circles, the colors spreading outward like waves made by a stone dropped into still water. If the iodine be kept steadily in position, the colors will be repeated—that is, the color which first appears under the iodine will reappear.

All are well aware of the fact that a half-blown soap-bubble is "colorless," and that it shows the prismatic colors when much thinner. These colors are also exhibited by corroded glass, and by some specimens of coal, and by oil spread thinly on the surface of water.

If color depended on kind of matter—that is, if each element had its own hue, and only one, it would seem that all compounds of any given elements ought to be similar in color. They are, however, often quite unlike. Thus, one compound of chromium and oxygen is a decided green, while another is beautiful red. One oxide of copper is red, another is black. Oxygen forms with lead compounds that are respectively yellow, brown and red. Solid black carbon, and solid opaque, yellow sulphur, when combined, form a colorless, limpid liquid.

If it be true that blind persons can distinguish color by the sense of touch, the fact very strongly supports the view that the color of opaque objects depends on the mechanical condition of surface. They feel minute *shape*, and not *light*, because no light proceeds from the spot touched while the finger is against it.

Many more examples might be given, but the foregoing are enough to furnish food for much reflection by those who may think that color is a fixed property of matter.

THE SCIENCE OF TRANSPORTING PETROLEUM. We read that at a late meeting of the Mechanical Section of the British Association, there was a most animated discussion about new types of petroleum ships—an important industry having arisen of late years in the construction of vessels specially adapted to the trade. Electric lighting, the position of the machinery, the arrangement of tanks, and the distribution of cargo in reference to the stability of the vessel, were exhaustively discussed, and "it was incidentally stated that as the oil gives off a most inflammable vapor, safety-lamps have to be used on board ship." This is incidental, of course, as it only relates to the chances the ship and living creatures on board have of being blown to atoms by an explosion.

BRICKS OF MESOPOTAMIA.—Unburned bricks, says the *Brickmaker*, were never regarded by the inhabitants of Mesopotamia as a safe building material, and experience demonstrated the necessity of supplementing with huge buttresses the buildings in which the material was employed, and it is probable, from the evidence of those who have explored these ruins, that the supplemental supports were more thoroughly and carefully constructed than the buildings the walls of which they were intended to sustain. The crude brick walls of Chaldean buildings were perforated with numerous ventilating tunnels, through which the warm air could penetrate, and thus dissipate any moisture that might be contained in the bricks. Perforations of this kind have been discovered in the ruins of Babylon and also in other Chaldean cities; but in Assyria no such openings of the kind which we have described, for the admission of air, have been found. It is the almost unanimous opinion of explorers that sun-dried bricks were never left unprotected in Mesopotamia, the material being commonly protected by a thin coat of stucco. It is stated by M. Place that at Nineveh this stucco was formed by a mixture of burned chalk and plaster, the compound producing a sort of white gum which adhered intimately to the clay wall. It is probable that many buildings had no outward ornament beyond that imparted by the brilliant whiteness of this stucco, the effect of which is still to be seen, even at the present time, in the whitewashed houses of the East.

PHOTOGRAPHING THE STARS.—The New York *Star* furnishes the following description of the manner in which this interesting operation is accomplished: The method of photographing stars is interesting. When the photographer places in the focus of the telescope a highly sensitive photographic plate, the vibrations of the rays of light throw themselves assiduously on the plate and steadily apply to the task of shaking asunder the molecules of silver salts in the gelatine film. Just as the waves of ocean by incessantly beating against a shore will gradually wear away the mightiest cliffs of the toughest rock, so the innumerable millions of waves of light persistently impinging upon a single point of the plate will at length effect the necessary recomposition and so engrave the image of the star. It will be obvious that this process will be the more complete the longer the exposure is permitted, and thus we see one of the reasons why photography forms such an admirable method of depicting the stars. We can give exposures of many minutes or of one, two, three or four hours, and all the time the effect is being gradually accumulated. Hence it is that a star which is altogether too feeble to produce an impression by a telescope of the utmost power may yet be competent, when a sufficient exposure has been allowed, to leave its record on the plate. Thus it is that photographs of the heavens disclose to us the existence of stars which could never have been detected except for this cumulative method of observation that photography is competent to give. No telescope is required, as the photographic apparatus takes the exact impression.

PHOTOGRAPHING SPEECH.—*Popular Science News* says: It is stated that M. Leon Esquine, a Mexican, has perfected a marvelous invention in electricity and photography. By speaking in a photophone transmitter, which consists of a highly polished diaphragm reflecting a ray of light, this ray of light is set into vibrations, and a photograph is made of it on a traveling band of sensitized paper. Now comes the wonderful part. If the image of this photographic tracing is projected by means of an electric arc or oxyhydrogen light upon a selenium receiver, the original speech is then heard. It is evident that there is no limit to the development of this peculiar combination of methods. This is very important, if true.

HIGHT OF GREAT WAVES.—Carefully repeated experiments made by an English navigator at Santander, on the north coast of Spain, showed the crest of the sea waves in a prolonged and heavy gale of wind to be 42 feet high; and allowing the same for the depth between the waves, would make the hight 84 feet from crest to base. The length from crest to crest was found to be 389 feet. Other estimates of the waves in the South Atlantic during great storms give a hight of 50 feet for the crests and 400 feet for length. In the North sea the hight of crest seldom exceeds 10 feet and the length 150 feet.

CHANGE IN EGGS.—It is a common fact that eggs, though so well inclosed, begin to decrease in specific gravity, as well as freshness, as soon as they meet the air. This is shown by the popular test of age in lye or brine. A fresh-laid egg will descend to the bottom of a solution that will float it higher every day thereafter, until it will soon appear above the surface. A coating impervious to the air prevents these changes.

USEFUL INFORMATION.

THE RUBBER USED FOR HORSESHOES is of a peculiar character. It is quite a new material, and one of great durability and lightness, which the ingenuity and fertility of resource has produced and adapted to horseshoes. These shoes may be described as frictional elastic shoes, providing a horse with a covering of the foot closely resembling the natural hoof. Owing to its semi-elastic and peculiar properties, it can be cut and pared to fit the hoof, and nailed on in the ordinary way. These shoes give a firm foothold on all sorts of pavements, even if covered with ice or snow. It is stated, after a series of trials in London streets, that the new shoe will last as long as an iron shoe, but the cost appears to be 40 per cent greater. It is probable, however, that this apparent loss would be a decided gain in saving of wear and tear of horseflesh, while it would certainly preserve the high-stepping action so much admired in park hacks. Animals with tender feet and legs gain confidence and strength when shod with "whaleite." A boot for horses is also made of the material, which is being used for boot soles. A company under an influential directorate is being formed to work the invention.—*Ex.*

PRESERVING FRUIT IN SAND.—It is said that the Italians have a method of preserving citrus fruits in sand. An excavation of from four to seven feet is made, and a board floor put in it. Upon this floor about three inches of clear dry sand is placed. The fruit (orange or lemon) is carefully cut from the tree and wrapped in tissue-paper. The fruit is then laid upon the sand in such a manner that the wraps do not touch each other. Three inches more of the sand is then spread on the oranges, and another layer then put down in the same manner as the first, and so on until there are three tiers of either. If more than three tiers are laid down, the underneath oranges are crushed. Sand to the depth of seven or eight inches is then spread over the whole. Oranges are frequently kept for months by this process and kindred methods. All authorities are agreed that oranges and lemons, which are intended to be preserved, should be cut, not torn, from the tree. A similar method has been adopted by a grower of oranges in South Africa, and the fruit comes out of the "silo," as he calls it, in famous condition, at a time when oranges are scarce and yield good prices. Sweet potatoes may be preserved in the same manner.

FIRING FOR STEAM BOILERS.—Manufacturing neighborhoods, and especially large cities, would be saved the annoyance of a vast amount of sooty carbon if firemen were property taught how to feed the furnaces. It is the practice of perhaps nine in every ten firemen to throw a large amount of coal into the furnace at one firing, thus making fire so deep that it cuts off air supply that should come through grates, and in consequence the coal on top is rapidly coked by heat underneath, and gas and smoke (the very cream of the coal) escape unconsumed. An equal amount of coal placed in the furnace in three or four firings, instead of one, would in many instances evaporate much more water and almost entirely avoid the emission of heavy masses of black smoke from the stack. In their efforts to abate this smoke nuisance, from which the people of this city suffer manifold discomforts, the authorities should receive every encouragement from manufacturers. Hasten the day when the smoke nuisance shall be done away with, and the atmosphere of our large cities on any day of the week shall be as translucent as it is on Sunday.

PECULIARITIES OF MOTHS.—More than 150 years ago Reaumur, observing that clothing moths never attacked the wool and hair on living animals, inferred that the natural odor of the wool, or of the oily matter in it, was distasteful to them. Consequently he rubbed various garments with the wool of fresh pelts, and also wet other garments with the water in which wool had been washed, and found that they were never attacked by moths. Experiments with tobacco smoke and the odors of spirits of turpentine showed that both were equally destructive, but it was necessary to close the room very tightly and keep the fumes very dense in them for 24 hours to obtain satisfactory results. Chests of cedar or sprigs of this tree are so disagreeable to them that they will not deposit their eggs where this odor is at all strong, but should the eggs be laid before the garments are placed away, the odor will not prevent the hatching nor the destructive work of the larvæ afterward.

A PROCESS OF LETTERING BONE OR IVORY by sinking the letters into the material in a permanent fashion has recently been introduced. These ivory plates are taking the place of engraved metal plates for signs, checks, badges, and so on. Electrical engineers have also adopted the new plates, which can likewise be applied to organs and pianofortes.

TRAVELING BY RAIL is said to be much safer than by coach or horseback, and probably it is much safer than any other method of getting over the earth's surface that man has yet contrived, unless it be by ocean steamer. There is some show of reason, says an exchange, that traveling by rail is safer even than walking. The figures show that the passenger may travel continuously day and night at the rate of 30 miles per hour for 36 years before being either killed or injured. While the calculation of chances of receiving injuries while walking is pure guesswork, it may be claimed that the average proportion of minor injuries resulting from sprains, bumps, bruises and falls would be greater than one in 36 years of continuous pedestrianizing. The statement that railway traveling is safer than walking is not quite so wild as it appears.

A NEW ARTIFICIAL LEATHER.—Several different preparations have been devised as a substitute for leather, but nothing as yet seems to be a success in that direction. The latest device is one invented by Dr. George Thenius of Vienna, who makes what he calls an artificial leather from red beechwood. The best wood for the purpose is taken from 58 to 60 years old trees, cut in the spring, which must be worked up immediately, bark peeled off, steamed, treated with chemicals in a kettle under pressure, and exposed to several more operations which the inventor does not mention, as he wants to have them patented. From the prepared wood strong and thin pieces are made by means of heavy pressure. The inventor states that a solid sole leather can be obtained, which he claims is superior to the animal leather in firmness and durability, can be worked up in the same way as animal leather, nailed and sewed.

THE LATEST TRUST.—The New York *Journal of Commerce* says that a meeting of the heavy carpet manufacturers of New York, New England and Philadelphia was held recently at the Fifth Avenue hotel. Although the meeting was held behind closed doors, enough is known to warrant the statement that initial steps were taken looking toward the formation of a carpet trust which will control upward of 75 per cent of the entire carpet production of the country. Outside manufacturers whose interests would be in a measure jeopardized by such an organization are skeptical as to the success of the movement, as, they say, the industry is too complex to be consolidated under one general management. But it is stated that a carpet trust is one of the near probabilities, and that German and other capitalists are prepared to put in $25,000,000.

JAPAN is rapidly growing in civilization, and we should not be greatly surprised if it turns into a republic some day in the not very distant future. Among other encouraging things, we learn that the Imperial University at Tokio has now no less than 138 instructors and 788 students. That would be a very respectable college in any country. "New buildings for technical education and a new chemical laboratory has been erected at a cost of nearly $300,000, and more money is promised by the Government for further extensions." The Mikado's palace is lighted by electricity, the dynamos for which are run by a Sweet straight-line engine.

GOOD HEALTH.

Health of the State.

Dangers to be Avoided.

The monthly bulletin of the State Board of Health for September, 1889, contains reports from 106 localities throughout the State, with an estimated population of 799,000, in which the deaths reported are 876, an annual mortality of only 13.08, which, while a very low percentage, is still much higher than the record for August. The reports of many of the local health officers throughout the State express much surprise at the immunity from sickness which prevails in their various localities at this season of the year. This immunity is considered largely due to the increased diligence which has lately been manifested in the cleanliness of towns by which breeding-places for disease are kept in subjection.

Typhoid Fever, and How to Avoid It.

It is noticed by the monthly reports that typhoid fever is increasing in the State. This may be expected at the present time from the extensive lowness of the water in our rivers and small streams. In regard to this the report before us throws out the following very timely suggestions: "This increasing prevalence of typhoid fever should put us upon our guard relative to the water we drink, and especially to the sources from which it is derived, as it is acknowledged by all those physicians who have carefully investigated the sources from which the disease is communicated, that in 90 cases out of 100 the chief distributor of the infection is water. It can, however, be communicated by air, the clothing of the sick, and by the hands of the attendants, if precautions are not taken to observe the utmost cleanliness. The possibility of infection by drinking-water should render it the care of a paternal government to supply the people with a pure water free from pollution of any kind. At present an attempt is being made to turn the sewage of some large towns into one of the chief rivers of the State. If this is permitted, the result cannot be otherwise than an increase of sickness wherever this river-water is used for domestic purposes.

"The excreta of *one* typhoid-fever patient poisoned the whole water-supply of a town in Pennsylvania, caused the sickness of over 1100 persons and the death of 414. If the diffusion of the excreta of one person carried into river-water used for domestic consumption was followed by such dire consequences and fatal results, what may we expect when the sewage of many towns is conveyed into our rivers to pollute their waters and poison the consumers? That the purity of our drinking-water has a marked influence in lessening the prevalence of typhoid fever may be instanced by the City of Vienna. In 1854 to 1874 that city was supplied by well-water, and water pumped from the River Danube. The deaths annually from typhoid fever in these years averaged 340 in each 100,000 people. In 1874 a supply of spring-water was introduced, and the deaths immediately fell to 50 in 100,000. As the well and river water continued to be abandoned and the supply of water entirely obtained from the springs, the deaths from typhoid fever have fallen to 11 in each 100,000. Can we ask anything more convincing than these statistics to impress us with the necessity that exists of preserving the purity of our water supplies, and keeping them free from sewage contamination? The question of how we are to dispose of our sewage is one that must engage the attention of our legislators before very long. Self-preservation will compel attention to it, as daily our soil is becoming more and more saturated with excremental matters, and it is only a question of a very short time when the ground air will be charged with virulent poisons, and the ground water surcharged with living messengers of death, so that we will be forced into the preservation of our water-supplies from contamination if we desire to preserve our health and our lives."

Consumption in California.

The report gives the following timely suggestions in regard to the prevalence of consumption in this State: "We have noticed with some apprehension the frequency with which consumption is mentioned in our reports, which might convey an erroneous impression that the disease was increasing in the State among the rising generation. That this, in a limited sense, is true, cannot be denied, but is capable of satisfactory explanation when we take into consideration the fact that for some time past California has been extensively advertised in the Northern and Eastern States as the sanitarium of the world; its luscious fruits and semi-tropical verdure have been exhibited, and its 'glorious climate' so dilated upon that a perfect exodus of diseased humanity has been precipitated upon us. Thus we find sufferers from tuberculosis in all its stages lounging in our hotel corridors, crowding our health resorts, filling our churches and assemblies, and scattering the seeds of death with every mouthful of saliva they expectorate so promiscuously wherever they are gathered together. To this influx of immigrants with diseased lungs may we attribute the apparent increase of consumption in this State. The expositions upon our 'glorious climate' throughout the East have sent us an undesirable element in the population of any country. There is no longer any doubt of the contagiousness of consumption, or of the fallacy that cure resides in climate. The climate of many parts of California will, no doubt, prolong the life of many consumptives, and, perhaps, arrest the disease in a few, but until we can afford to build sanitariums for the isolation of this class of patients, or erect hotels, and devise pleasure resorts for their exclusive use, our State is better off without these immigrants. They disseminate a disease which practically might be unknown under proper sanitary laws, increase our mortality returns, and lessen that high standard of health to which the State is capable of attaining, from its unsurpassed climate, its geological formation, and its possibilities of presenting a temperature suitable to the climatic wants of any constitution which the system may demand for the better preservation of its perfect health."

CONVULSIONS IN CHILDREN.—When a child has a convulsion, or what is commonly called "a fit," attention should be given to the urinary secretion at once. If there is suppression of urine, the child should be put into a warm bath and made to sweat as speedily as possible. In many cases in which children die from a succession of convulsions, the real cause of death is suppression of urine (a fact which is probably not so generally known as it should be), so that the child really dies of poisoning through the retention of the urinary secretion. When a child is subject to attacks of this character, care should be taken to dress it warmly in flannels, so as to keep up a degree of perspiration most of the time, and hot baths should be administered frequently.

HEALTHFULNESS OF FLOWERS AND PERFUMES. It is now established that flowers and the perfumes distilled from them have a salutary influence on the constitution and constitute a therapeutic agency of high value. Residence in a perfumed atmosphere forms a protection from pulmonary affections and arrests phthisis. In the town of La Grasse, France, where the making of perfumes is largely carried on, phthisis is unknown, owing to the odorous vapors from the numerous distilleries.

THE world's medical periodicals number about 266, of which no less than 174 are published in the United States.

LEECHES are more used than they were ten years ago, a barber says.

ELECTRICITY.

Triumphs of Electricity.

The report comes from France that the entire process of tanning hides of all kinds is being revolutionized by electricity. By the present process the conversion of hides into leather requires from 6 to 12 months' time. Much experience is required to conduct the operations properly. With the greatest care and the best facilities, many of the hides are imperfectly tanned. A large plant is required when several thousand hides are to be converted into leather in the course of a year. Large capital is also needed, as the raw material purchased cannot be put into a form that can be sold for a long time. It costs less to fit up a tannery than it does a cotton factory, but the products of the latter can be sold at the end of each day's operation. By the electrical process the light hides, like those of the sheep and goat, are tanned in 24 hours. Calfskins are converted into leather in three days and ox hides in less than a week. It is claimed that the operation of tanning is perfectly performed, while the cost is reduced one-half. Only one-fifth as many men are required to tan a given number of hides. A tannery that employs the electrical process may be a very small affair and still do a great amount of work. But little capital is required to operate it, as the hides bought one week can be sold the next. The process described in the French papers is a very simple one. The prepared hides are placed in large cylinders which revolve upon horizontal axes. A decoction of tannin is placed in the cylinders with the hides and a current of electricity is kept passing through it. Aluminum is being separated from the oxide by means of an electrical current. The oxide is dissolved by some metallic flouride and the pure metal is deposited in a fused form. The substance employed as a solvent can be used for an indefinite time, as none of it is wasted or decomposed by the electrical action. Another use for electricity has been found in a device for holding dishes on a table set in the dining-room on an ocean steamer. It consists of a small piece of iron sunk into the bottom of each dish, which touches a wire rendered magnetic by means of a current.—*Chicago Herald.*

THE FUTURE OF CITY TRANSPORTATION.—The future possibilities of electricity, as applied to locomotive purposes, makes one fairly dazed with the impossibility of grasping the subject. Much has been said and written in regard to the application of electric-power to street railways for the transportation of passengers, and this especial branch of electric-power has already developed into a great industry, the size of which is appreciated by few. The application of electric-power to the transportation of merchandise in our great cities is yet a *terra incognita*, though its possibilities are even greater than the street-railway service. An electric street car can, under skillful management, be operated cheaper than one drawn by horses. It requires three times the power to propel a vehicle over a stone pavement that it does on a rail or iron roadways. Horses cannot draw heavy loads on iron roadways because of the difficulty of obtaining a sure footing. On an iron roadway an electric locomotive can draw a load for less money than horses could draw the same load on the best stone pavement. The expenditure for cartage in the City of New York each year reaches the enormous sum of $100,000,000. At some future day, not far distant, we hope, when the public are sufficiently aroused to the importance of this question, a certain width of our great thoroughfares all over the city will be given up to an iron roadway, on which self-propelled electric vans may noiselessly carry on the great traffic which now offends our ears, wears out horse-flesh, and has been but little improved up to the present time since the days of the Cæsars. In fact, we aver that with our boasted improvements of the nineteenth century, it requires more expenditure of horse-power to draw a ton of merchandise a mile in the streets of New York than it did in Rome in the early days of the Empire. —*Electrical Review.*

THE IMMENSE ELECTRIC PLANT that is now being erected at London on the Thames river will consist of at least six buildings. The engine recently put in is of 5000 horse power and runs one dynamo capable of generating electricity for over 40,000 lights. The driving-wheel to this dynamo is over six feet in diameter. There are very few arc lights in London, as the majority of business men look with disfavor upon running any extra risk of fire.

LIGHTNING has been known to strike overhead electric-light wires and discharge itself through the dynamo to earth, to the imminent danger of the machine.

A BIG $200,000 central electric-power station is among the probabilities in Cleveland, Ohio, where the progress of electric roads has been markedly rapid.

IN AN ELECTRIC ROAD the power the engine develops is directly in proportion to the work being done, whether one or a dozen cars are in the circuit.

THE San Jose electric railroad is to be operated by an overhead system, the underground plan having proved a failure.

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Passing Events.

The decision of the Treasury Department with regard to free lead ores from Mexico and Canada will be a great disappointment to the lead miners of the Pacific Coast, for it legalizes a continuance of a practice which has wrought great injury to the lead-mining interests of the United States.

The reduction of freight rates on ore will doubtless bring renewed prosperity to the famous old camps of Eureka, Nevada. It will admit of the miners of that district shipping lower grades of ore to other centers, so that local "smelting trusts" cannot longer control the product of the region adjacent to Eureka.

The early but heavy rains which have prevailed all over the coast for some days have brought a very desirable water supply which will start up many mills and mines. In many places stamps have been hung up for lack of water for a month or two, the suppiy having been short this summer. There will now be an abundance to fill all the ditches and streams.

The coinage of silver dollars is to be resumed at the Mint in this city. It is the opinion that henceforth the San Francisco and Carson Mints will be allowed to coin a part of the $2,000,000 which are turned out every month. Silver bullion to the amount of $200,000 has been shipped here from Omaha. Last year less than $300,000 in silver, all told, was coined at the Mint in this city.

ARIZONA MINERALS.—The Governor of Arizona says the mineral products of 1888 are given as follows: Copper, 31,797,000 pounds; gold, $850,000; silver, $560,000. With better railroad facilities the Governor thinks the mineral output would be greatly increased.

ST. LOUIS AND NEW YORK CAPITALISTS are putting $2,000,000 into a 100,000-acre grant in Mexico, where is located the Vegonia vein and a number of undeveloped ledges.

Mexican Lead Ores.

The decision of the Treasury Department with relation to Mexican silver-lead ores, just given out, will be a great disappointment to the mining community; though the great smelting companies now reaping a profit from the ruling will rejoice. Miners do not believe that the decision is legal, but it will be impossible to change it until Congress again meets. Whether, even then, the smelting companies cannot put off legislation still further, is a question. Some sections of the country, where there are great smelting plants, prefer to see the present system continued, though the miners who have lead ores to sell which are produced in this country are the sufferers.

Secretary Windom, in his decision, sustains the present classification that admits argentiferous lead ores imported from Mexico free of duty. The Secretary, in his letter promulgating the decision, after reciting the uniform decisions and practice of the Department with respect to the classification of these ores since 1880, says: "The dutiable or non-dutiable character of these ores was a subject of investigation by the Judiciary Committee of the Senate, who reported, on the 5th of July, 1888, in effect, that ores of the character mentioned, namely, ores containing more lead in weight than either gold or silver, but more gold or silver than lead in value, are not, in the opinion of the committee, subject to duty under the existing law. If the question presented were a new one, and had not been a subject of administrative construction, fortified by the opinion of the Judiciary Committee of the Senate, I would feel at liberty to give greater consideration to the weighty arguments which have been adduced, tending to establish the dutiable character of all ores of this description containing lead in appreciable or considerable quantity, more so if it had been satisfactorily demonstrated that these ores are not known, nor entitled to be known, commercially, as ores of silver."

He assumes that the rulings and practice in vogue were known to Congress when it passed the Tariff Act of 1883, and that the Department is without authority to change the congressional definition of ores, on the faith of which large business interests have been established. These large "business interests" are the smelting plants which are making more money out of these Mexican ores, produced by peon labor, than they could out of ores produced in the United States. The Secretary says: "That Congress did not intend to impose a duty upon lead which might be found in different ores, but only upon such ores as were then recognized under decisions of the Department as lead ores, is gathered from other parts of the Tariff Act, for in paragraph 186 'copper' is made dutiable whenever found in ore, and in paragraph 191 'nickel' is also made dutiable whenever found in ore or in other crude forms. In those cases it is clearly metal contained in ore which is made subject to duty, and had the same form of expression been used in reference to lead, that metal would have been dutiable at the rate prescribed whenever found in ore. According to well-settled rules of statutory construction, this difference in form of expression must be deemed to indicate different legislative intent and to limit the authority of the Department to impose a duty in such cases to the ore itself under existing rules of classification. I consider, therefore, that the present classification has attained the force of congressional enactment, and that change, if desired, must be sought in congressional intervention."

The smelting and reducing corporations on the frontier will continue to reap large profits, while the lead miners of the whole country will suffer. Canadian ores can come into Oregon, Idaho and Montana under this same ruling. Lead ore pays duty; silver ore does not. Under Secretary Windom's ruling large quantities of lead ore come in duty free under the bald pretense of being silver ore. It is understood that Judge Bachelder, the Assistant Secretary of the Treasury, gave this whole subject a careful examination, and came to the conclusion that the foreign ores should pay duty before being admitted into the United States, but an order from the President delayed the decision. The matter became one of international importance, and it has been finally decided in favor of the Mexican ore men and American smelting companies.

The Eclipse Expedition.

On the 16th inst. the U. S. steamship Pensacola, with 375 officers and men and 40 scientists, left New York for the west coast of Africa, where the total solar eclipse of December 22d will be observed. The expedition is well equipped with the most improved instruments, some of which are new inventions. Prof. Todd of Amherst College is the head of the astronomical party. Mr. J. E. Jens, our correspondent at New York, was among those who went down to see the party off. He writes us that Prof. E. J. Loomis of the Smithsonian Institute goes along to study African plants and birds. Prof. C. A. Orr, anthropologist of Clark University, will upon reaching the coast of Africa leave the expedition, and accompanied by five black and five white men, all fully armed, strike out for the interior, visiting many of the native tribes, whose manner of living he will closely observe, photographing and measuring them, noting their habits and studying all the characteristics peculiar to each tribe. H. Chatelain accompanies the expedition to talk Portuguese to the African settlers. Prof. Bigelow will help Prof. Todd manage the observations, as will also S. H. Jacoby, who represents Columbia College, and H. S. Davis of Princeton College. Harvey Brown of the National Museum, at Washington, goes as naturalist. The Pensacola is in command of Capt. A. B. Yates. All hands will eat their Christmas dinner in St. Paul de Loanda, Africa, and will return about next May, when we may learn something new in regard to solar heat and the whole solar system. H. Carbut of Philadelphia has gone to photograph the eclipse as well as all other interesting objects on the journey.

Owing to the public spirit of Mr. C. F. Crocker, the Lick Observatory of this State is enabled to send a party also to observe this clipse, that gentleman having undertaken to defray the expenses from his private purse. The Lick Observatory has sent two experts—Burnham and Schaeberle—to Cayenne. One of their duties will be to verify an important observation made at the eclipse in January last. On this occasion a remarkable extension of the outer corona was noticed and appears on a number of the negatives taken with the large instruments. Professor Holden considers it very desirable to secure photographs of the regions still further remote from the moon's limb. Some observers, who contend for a connection between the solar corona and the zodiacal light, hold that the direction of the principal streamers in eclipses occurring in December and January exactly bears out their view, and they look to the coming event for final confirmation.

Messrs. Burnham and Schaeberle will do the chief work at Cayenne. They will have at their disposal a six-inch Dallmeyer photographic lens from the Washington Observatory and a six-inch portrait lens which did good service at the California eclipse in January in the hands of Mr. Ireland. Mr. Burnham will also have a six-inch Clark telescope stopped down to three inches.

The objects of the expedition are threefold. First, to obtain negatives of the inner corona, showing all the detail possible from the limb outward; secondly, to secure photographs of the extension of the outer corona; thirdly, to secure photographs with a small camera immediately after the third contact, on standardized plates, for use in measurements of the brightness of the sky. Mr. Burnham will remain in Cayenne for some time after the eclipse to take advantage of the opportunity for stellar observation in the southern heavens.

YUKON MINERS.—Forty-six miners came down this week on the steamer St. Paul from the Yukon river, Alaska, and very few had realized from the placers more than enough to pay their passage home. There is said to be no danger of starvation among the miners wintering on the river, as one of the Alaska Commercial Co.'s supply steamers has gone up to within 200 miles of the miners' camps.

THE British ship Earl of Granville has cleared at Port Townsend for Shanghai with 982,000 feet of lumber. In the hold were four sticks of fir 24x24 inches square and 110 feet long.

THE Thomson-Houston electric railway system has been adopted by the San Jose and Santa Clara Street R. R. Co.

Land Grants and Minerals.

As before noted in the PRESS, the Montana mining public is exercised over the probable issuance of patents to the Northern Pacific railroad on lands well known to be mineral in character. In fact, in Oro Fino district, in one section claimed by the railroad company, is the Champion mine, which alone is valued at over a million dollars. If the patents are issued, the mines will belong to the railroad company. The Board of Trade of Butte, M. T., has sent to the Secretary of the Interior the following telegram:

In behalf of the miners and people of Montana, we earnestly request and urge that any order for the issuance of patents to the Northern Pacific Railroad Company for lands in Montana, be delayed until a full and proper presentation of the facts as to the mineral character of a large portion of them can be made. Millions are at stake, and our people are threatened with irreparable injury which will bring ruin to thousands. Vigorous measures are being taken to present the facts to your Department.

A delegation of mining men from the Oro Fino mining district sent a similar telegram. Last year the miners of Montana held what is called a mineral-land convention at Helena and presented the facts in this case to the Department in categoric form. The papers have been pigeon-holed at Washington, and lost through the change of administration. S. M. Stockslager, ex-Commissioner of the General Land Office, says a recent decision of like nature by the Department in favor of the Central Pacific railway would probably act as a precedent in the Northern Pacific case, and the patents be issued, notwithstanding the protests.

Railroads and Ore.

The first thing a mining camp wants is mines; then it wants capital to develop them; then comes the need of smelting works or mills, and then a railroad, and after that cheaper rates of transportation. It seems that all of these things are necessary, though it might be supposed that when the smelter or mill period arrived, the people could get along very well without the iron tracks. It appears to have been generally the case, however, that unless there were means of transportation for low-grade ores to other reduction centers, the local works have made such charges as to get about all the profit there was from most of the mines and claims.

Eureka, Nevada, has been in this fix for some time. The smelting companies have made such a scale of charges, and the nearest railroad such a rate of transportation, that the camp has been far from prosperous. Quite recently, however, as noted in the PRESS, the rates of transportation on ore to other smelting centers have been materially reduced, which will bring about a lively competition on low-grade materials. Unless the smelters are reasonable, all the ore will be shipped elsewhere.

All this is good for the miners. Many of them can now work claims which were practically valueless under former conditions. There will be more men at work, more money in circulation, and a more prosperous community. A recent sale of the Diamond and Antelope mines in the district will still further better matters. The developments in these mines by the new owner will renew life in the district and bring back numbers of men who have left for other camps.

MORE LOWER CALIFORNIA PLACERS.—The discovery of rich placers is reported at San Pedro Martier, Lower California. They are northeast of Vallecios valley about 55 miles, and the water is said to be good and plentiful. Several hundred prospectors have already gone to the placers, and the Mexican customs officers have increased their force, expecting a rush. Miners are said to come into Alamo from the new fields to trade nuggets for provisions and then hurry back. A Mexican has brought in one nugget worth $60. A dispatch states that freighters from San Diego and Ensenada are refusing freight and taking passengers only. This will cause doubtless another Lower California "excitement," if the reports are only half truth. Nothing is known of the extent of the new fields. Judging from the character of the country, the diggings are probably "dry."

THE Copper Queen mine at Tombstone, Arizona, has paid $70,000 in dividends this year.

Bedded Ore Deposits.

The ore deposits of all that portion of the San Juan country within the borders of Ouray county, Colorado, are either in the tertiary eruptives or confined to a relatively narrow zone in the sedimentary beds just beneath them. The ore deposits in the igneous formation would be classed as fissure veins. In addition to these, however, there is that form of fissure locally called "chimney." In the sedimentary formation the ore deposits are either fissures, usually along fault-planes, or intercalated beds between limestone, which forms the footwall, and a quartzite or shale that forms the hanging-wall.

The bedded deposit at Mineral farm consists essentially of a barite gangue, carrying silver, and occasionally bunches of argent ferous tetrahedrite. The Red mountain bedded deposit is on the west slope of Mt. Abram, near its base. Mr. G. E. Kedzie of Ouray, Colorado, read a paper on this subject before the American Institute of Mining Engineers from which we make the following extracts with engravings.

"In descending series from the park level, the first formation encountered in passing up-hill is a white and compact vitreous quartzite in beds from one to three feet thick. The 'pink quartzite' is a light-red argillaceous quartzite in thin beds, about 35 feet thick. The top of this bed is a fine-grained conglomerate, consisting of worn fragments of white quartz with a red argillaceous ground mass. The line of the bed which forms the hanging-wall of the ore deposit is finer grained and lighter colored.

"The crystalline limestone is white and massive-bedded, having a mean thickness of about 35 feet. This limestone forms the footwall of the ore deposits, which are mainly located on the upper portions of the bed, at or near its contact with the overlying pink quartzite.

"The lower quartzite is light-gray and foliated, and from one to two inches thick.

"The andesite constitutes the entire mass of the rugged mountains in the vicinity, and is nearly 3000 feet thick on either side of the valley. Microscopically, it consists of a light-gray or pink ground mass, with an abundance of white crystals of an altered feldspar together with few grayish-green crystals, either of hornblende or angite."

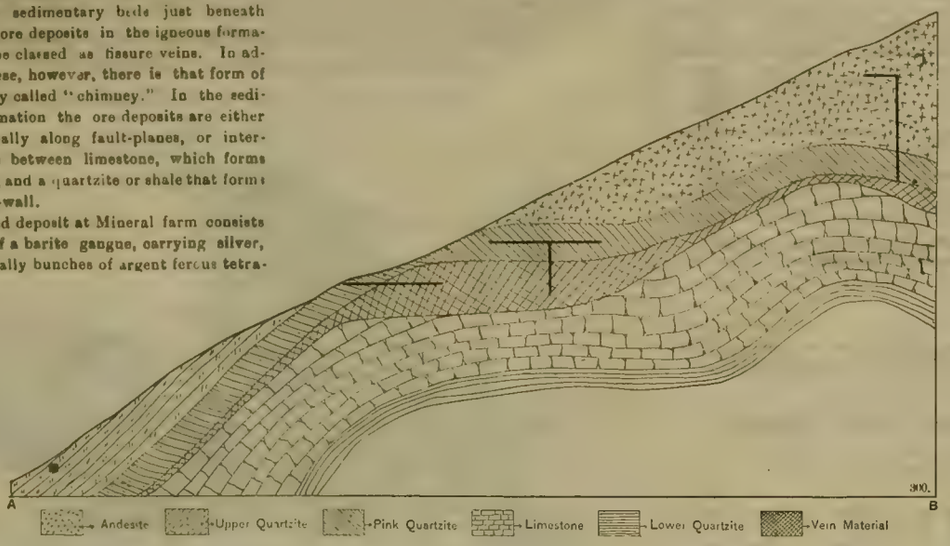
There are several vertical ore bodies, partaking of the nature of fissure veins, the principal one being the Mono. The ore body is from one to two feet wide, and is a continuous body of pyrite and chalco-pyrite. In general this ore is not very rich in silver.

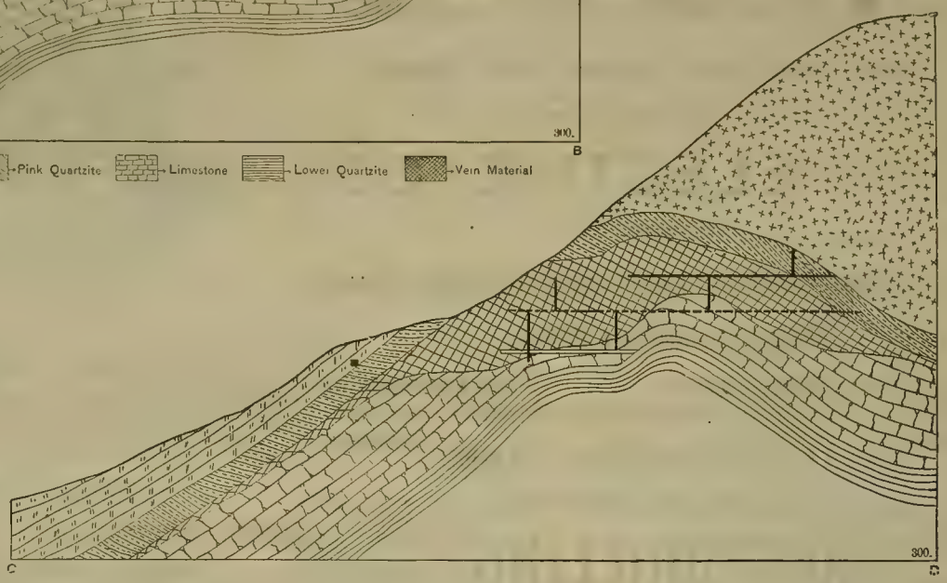
A vertical vein of barren quartz, with a few disseminated crystals of pyrite, is found just east of the Brooklyn workings. The walls of the vein, where is the igneous formation, are strongly kaolinized and heavily impregnated with pyrite.

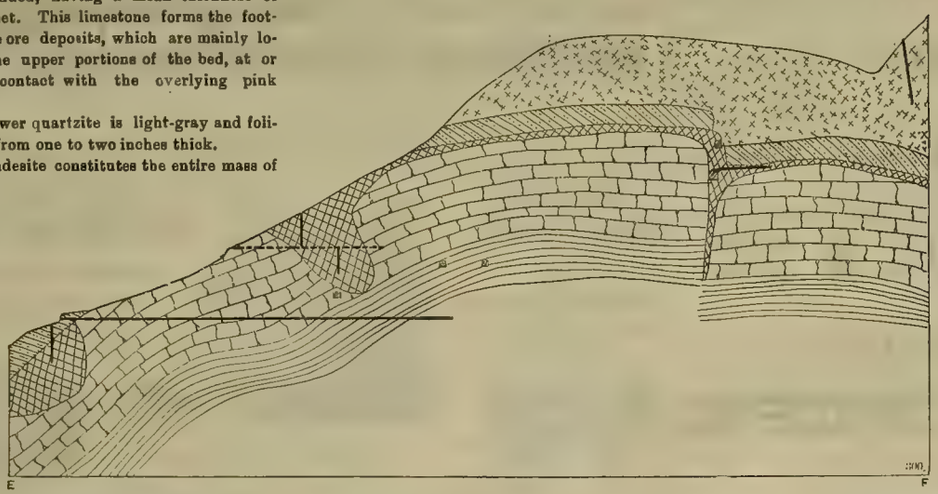
Lastly, at the Comstock workings, in the upper quartzite, there is a one-foot vertical ore body, the ore of which consists principally of galena, with some chalco-pyrite and blende, which, with large quartz crystals, forms a lining to a closely connected series of vugs.

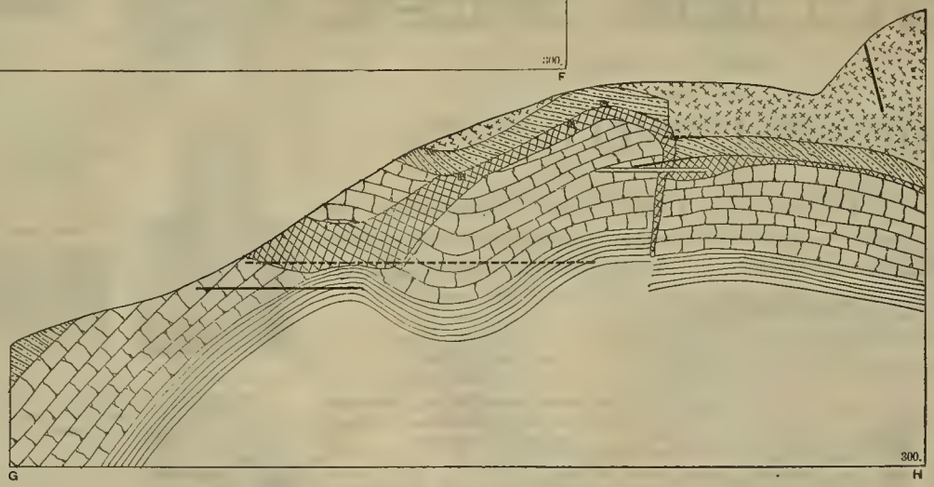
The ore body of the greatest commercial value occurs on the crystalline limestone, at its contact with the overlying pink quartzite. The minimum thickness of the vein material is three feet, but it extends downward into the limestone for a very variable distance, being nearly 100 feet thick at the Saratoga workings, while in the Brooklyn workings the vein material reaches nearly to the base of the limestone. The greatest longitudinal extent of these bodies of vein material is in a direction parallel with the strike of the inclosing rocks.

The rich ore bodies in the vein material are very irregular, and the line of demarcation between rich ore and low-grade vein material is exceedingly indefinite. There is, however, an apparent tendency of the richer argentiferous iron ore to assume a horizontal position, while the light-colored kaolin bands with which the lead values are associated assume positions nearer vertical along the original fracture planes of the limestone. The pyrite and the great mass of vein material is of low-grade in silver, containing from a mere trace to 20 ounces per ton. The assorted ores, which are shipped to smelters in ten-ton lots, vary from 50 to 80 ounces of silver per ton, with an occasional shipment giving much higher returns. All of the ores vary from one to three-tenths of an ounce of gold per ton.









BEDDED ORE DEPOSITS OF OURAY COUNTY, COLORADO.

Chrome.

Although California is one of the few places in the United States where chrome is found, the mining of that substance has not been profitable of late. The freight expenses have eaten up most of the profit. The chrome men want a higher duty put on the imported article, and say that if this were done many mines now unworked would pay. The most extensive deposits in California are in Placer, Alameda and San Luis Obispo counties. The deposits are irregular, however, the substance not being found in regular ledges anywhere. There are deposits in other counties than those mentioned and some of them are being opened.

Quite recently work has been commenced on a chrome mine 25 miles west of Red Bluff, Tehama county. The ore will be hauled to Red Bluff, shipped by rail to this city, then by sailing vessels to New York, and from there by rail to the Philadelphia Chrome Works. This mine can turn out about 15 tons a day now, with a dozen miners at work, but they expect to employ 50 men shortly. A good road is being built to the mine.

ALASKAN COAST.—The Government Coast Survey steamer Carlisle P. Patterson returned the past week from a five-months' cruise off the coast of Alaska. The engineers and officers of the Patterson have been engaged chiefly during their trip in making soundings along the coast south of Juneau and around Admiralty island, a large island east of Sitka.

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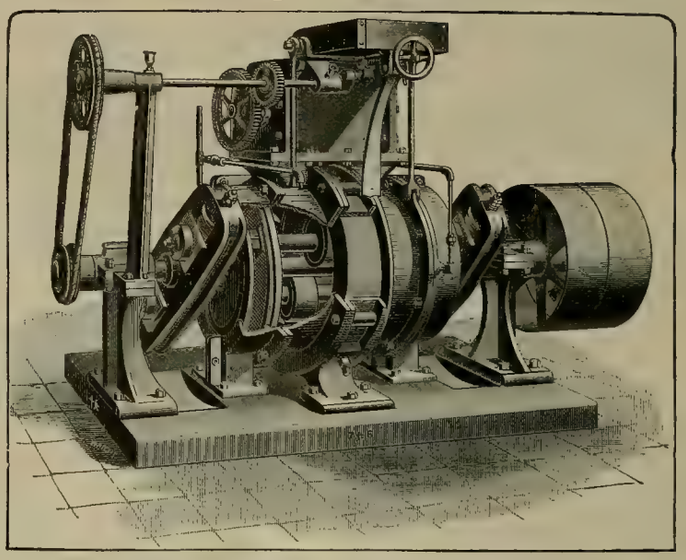
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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific States.

FOR WEEK ENDING OCT. 15, 1889.

413,125.—FRUIT-DRIER—J. H. Bard, Oakland, Ogn.

412,645.—SIDE-HILL PLOW—J. D. Burkhart, Dayton, W. T.

413,040.—FENDER GUARD FOR CARS—R. M. Edwards, S. F.

413,044.—CAR COUPLING—F. S. Fox, S. F.

412,741.—ORE SEPARATOR—J. B. Freeman, Los Angeles, Cal.

412,742.—ROAD-SCRAPER—Geo. Fry, Phœnix, A. T.

413,149.—HEADER AND THRASHER—Geo. W. Haines, Stockton, Cal.

412,757.—FASTENING FOUNDATIONS TO PILES, ETC.—R. Hunt, S. F.

412,923.—NECKTIE FRAME—Jos. Kaiser, S. F.

412,926.—CONE CENTER FOR LATHES—John Knight, S. F.

413,071.—DEVICE FOR SECURING THE COVERS OF BEDS—Rosa H. Lowe, Sumner, W. T.

412,965.—SEWER-FLUSHING TANK—E. B. Mastick, Alameda, Cal.

413,062.—PENHOLDER SOCKET—M. L. Rodrigue, S. F.

412,983.—WEED-CUTTER—E. Schmidt, Marysville, Cal.

412,699.—OBSTETRICAL APPLIANCE—J. P. Turney, Arlington, Ogn.

413,120.—CABLE RAILWAY CROSSING SIGNAL—G. H. Wright, S. F.

The following brief list by telegraph, for Oct. 22d, will appear more complete on receipt of mail advices:

California Elliott H. Woolsey, Oakland, speculum attachment; George Mullins, Los Angeles, mixture for refining copper and its alloys; Thomas F. Haggerty, San Francisco, concrete pavement; Reuben W. Hunt, San Francisco, roller bearing; Wallace H. Holland, Pasadena, holder for sashes or blinds; Leslie A. Gregg, assignor of half to Plank, San Jose, orchard cultivator; Charles O. Farcott, assignor of two-thirds to N. W. Spaulding and C. Goodall, San Francisco, automatic recording compass; Frank F. Eggers, San Francisco, for manufacturing battery zincs; Charles W. Bassett, Alameda, buckle; Henry Anderson, San Francisco, sewer.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable prices, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

DISTILLING APPARATUS.—Pedro Napoles of Napa, California. No. 412,407. Dated Oct. 8, 1889. This apparatus is mounted compactly upon a wheeled truck, whereby it may be transported readily. It consists essentially of a series of boilers operating in pairs, each pair independent of the other, whereby when one is being cleaned out, the other may be in use, thereby rendering the operation a continuous one; a steam boiler, a rectifier and condenser, pipes connecting the steam boiler with the boilers of the series, and controlling-cocks, whereby the steam may be directed into any or all of the boilers of the series, pipes connecting the boilers with the rectifier and condenser, and cocks controlling said pipes whereby the vapor may be directed from any or all of the boilers into the rectifier or into the condenser, and a pipe connecting the rectifier with the condenser.

ELECTRIC-IGNITING DEVICE FOR LAMPS.—Manuel Carranza of Guatemala, Central America, and Jose M. Tinoco of San Francisco, California. No. 412,464. Dated Oct. 8, 1889. This invention consists of a swinging frame adapted to be moved forward and backward to close and open an electric circuit, said frame having a spiral platinum wire in said circuit whereby it is heated to incandescence, and when brought into contact with the top of the wick lights the wick. In addition to these points are other mechanical constructions adapted to render the device simple and effective.

ADJUSTABLE CONE-CENTER FOR LATHES.—John Knight, S. F. No. 412,926. Dated Oct. 15, 1889. The main features of this improved cone-center are its peculiarly adjustable jaws. The object is to adapt the cone-center to pieces of work which have an open center or hole and which have to be trued from the outside irrespective of the inside. When a piece of work is put in the lathe which requires to be turned true from the outside without respect to the inside or center hole or cavity which it may have, then the jaws are properly set out independently of each other, to fit and bind upon the open center or hole of the piece of work and hold it so that its outside can be turned true.

AUTOMATIC SEWER-FLUSHING TANK.—Edwin B. Mastick, Alameda. No. 412,965. Dated Oct. 15, 1889. This invention relates to a device for automatically flushing sewers where it is necessary to have a periodical and intermittent discharge. The main portion of the body of the tank is rectangular, with the bottom horizontal; but from the point where it is pivoted, and about which the movement is made, the bottom slopes or inclines upwardly, gradually decreasing in depth, the two sides and the tank being continued out. By reason of this construction, the tank may be nearly filled with water and still maintain its normal position; but as the water rises and the weight is transferred more and more to the outer or wedge-shaped end, it will be finally overbalanced so that this shallow-pointed end will be tilted downward and the contents discharged. The tank again tilts back on being relieved of its load, ready to be again filled. This provides an automatic self-discharging tank which will continue to operate as long as the supply of water or other liquid flows into it, and it needs no attention, having no joints, hinges or other parts to get out of order.

HEADER AND THRASHER.—Geo. W. Haines, Stockton, assignor to the Stockton Combined Harvester and Agricultural Works. No. 413,139. Dated Oct. 15, 1889. This invention relates to certain improvements in that class of apparatus employed to cut, thrash and clean grain while the apparatus is traveling about the field, being propelled by steam, horse or other power. The patent covers certain details in the construction of the header portion of the apparatus, and its attachment to the thrashing mechanism.

NECKTIE FRAME.—Joseph Kaiser, S. F. No. 412,923. Dated Oct. 15, 1889. This invention consists of a skeleton frame, over which a necktie may be formed into a bow-knot, and the whole readily attached to the collar-button. The object is to provide a simple and effective device for enabling any one to form a necktie into a bow-knot and attach it in place, and also providing for the ready removal of the tie from its frame and the substitution of another tie.

Old Mining Districts.

There are numbers of mining districts on this coast which have been practically abandoned for years because the mines would not pay under the system in vogue when the camp had its boom, and many of them lie idle today because there was once a boom and no money was made. However, the time will come when most of those districts will again become the scenes of busy labor. Improved processes, less extravagant habits, better means of transportation, more knowledge, and better system should in a great many cases repopulate these camps and make them profitable. Mismanagement and the attractions of more prosperous regions had their influences in wrecking those districts, but the claims still remain and many pay under improved conditions.

The Placer *Herald* in speaking of the Ophir district gives some of the reasons why this and other quartz regions did not pay. It says:

The mines are just as rich to-day as ever, but the metal must be sought in lower levels than formerly in the mines that have been opened. Unfortunately for the reputation of the district, the miners that used to operate did not work systematically and in accordance with the laws that govern other industries. They were too impatient of delay, too anxious to strike a rich pocket to make the necessary preparation for the practical working of the mines. Though they might be poor in purse, they had no ideas of economy, and threw away the chance of making their fortunes through their carelessness of expenditure and their misdirected labors. In their haste to strike payrock they often found themselves unable when it was struck, to work it at a profit because they had neglected to do the preliminary work so necessary to the successful development of a mine. Although a fortune lay within reach, they could not handle it because their machinery was not sufficiently strong, or their pumps could not raise the water; or perhaps their funds through their extravagance failed just at the point when success was in sight. Sometimes when the pay chute was worked out they concluded it was no use to prosecute the work any further, as the lead had petered, and they abandoned the mine. Still with all their mismanagement and ignorance of the proper mode of mining, a vast amount of gold was taken out, and what is better, when the future of the district is considered, a large knowledge of the nature of gold-bearing veins was acquired by their misguided attempts to find out the mysterious hiding-places of the precious metal. This experience has taught miners that nature has not stored all the gold in the upper layers of the ledge. It has taught them that as they descend, successive deposits will be found, and that practically the possibility of exhausting the supply is limited only by man's power of descending into the earth. The greater number of the mines have only been prospected and only imperfectly at that. The shafts are mere pinholes and the cuts mere scratches. They tell nothing in many cases of what is below. The formation, the kind of rock in the hanging and foot walls, indicate that the mines are valuable and that they will well repay the labor of opening them. There is every indication that they are deep mines, and that years will be required to exhaust their treasures. There is no question of their richness and permanency, and all that is needed to make Ophir one of the great mining centers of the coast is capital and confidence.

THE Vallejo *Times* says: It is stated that the suit of George Schild vs. the United States, on account of infringement of patent in building the gates of the caisson, has been settled, Schild receiving $30,000.

The Clayton Air-Compressor.

(Continued from page 317.)

which is patented, and covers what is claimed to be the only practical and efficient method of circulating water around an air cylinder, for cooling the air.

The patent combined speed and pressure governor, for controlling both the air pressure and the speed of the compressor, operates by cutting off the steam when the desired pressure of air is attained and turning it on again when the pressure becomes reduced; in addition to this, the speed governor regulates the speed of the compressor. This governor is guaranteed to control both the speed of the compressor and the pressure of air without any attention from the engineer. Besides the foregoing, there are other features of excellence embraced in these air-compressors which add to the superiority of their general design.

In addition to their use in sinking caissons, working pneumatic riveters, furnishing air to divers in submarine operations, working rock-drills, coal-cutters and underground hoisting and pumping machinery and charging automatic sprinklers, they are largely used in the aerated system of burning crude petroleum for fuel purposes, and have been very successful in the transmission of natural gas. Four of a large size are being used for this purpose at Rixford, Pa., forcing the gas a distance of 13 miles, for heating and lighting the city of Bradford. They are also in use for a like purpose at Wellsville, N. Y.

Two duplex gas compressors have just been constructed for compressing 2,000,000 cubic feet of gas each, per day, to a pressure of 200 pounds per square inch, for the Kentucky Rock Gas Co. in supplying the City of Louisville, Ky. Natural-gas companies, civil and mining engineers, contractors, bridge-builders and others interested in compressed air, will do well to send for their complete Catalogue No. 6, to the Clayton Air Compressor Works, No. 43 Day street, New York.

Mining Personals.

Ralph Lowe of the New Almaden mines is in town from San Jose.

Archie Borland, the mine operator, has returned to Oakland from New Mexico.

Maurice Clark is superintendent of the Red Rover mine and mill, Actos, Los Angeles Co.

Superintendent A. C. Hamilton of the Chollar, Potosi, and other middle mines arrived in this city last week.

A. S. Bates, superintendent of the Adelaide copper mine, Nevada, has been informed of the death of his father, which occurred in New York, and he and Mrs. Bates have gone to that city.

W. E. Sharon, superintendent of several of the Gold Hill mines, Virginia City, arrived here on Oct. 18th, to attend a meeting of the managers of those mines to determine upon future work.

J. Everett Bird is superintendent of the Good Hope mine at Perris, Pinacate district, San Diego county. He has commenced a new $6000 residence. The shaft water will be used for irrigating, and handsome grounds will be laid out surrounding the house. Some 20 acres will be devoted to oranges and deciduous fruits. This is a good way to combine mining and fruit-raising, but there are not many sections of country outside of California where this can be done.

Luther Wagoner, mining engineer of this city, is at present engaged for the U. S. Geological Survey examining the reservoir sites to be formed in the higher Sierras of Tuolumne, Calaveras and Mariposa counties. Mr. Wagoner's party traveled by pack-trains and could only visit those sections where provisions and forage could be obtained. The party located about 50 sites suitable for small reservoirs, and also located and surveyed eight sites on which reservoirs of immense size and capacity could be constructed. These larger sites were surveyed in ten-foot counter-lines, but the actual capacity of each has not yet been calculated. Mr. Wagoner's party has located sites on which reservoirs could be constructed capable of furnishing the greater part of the San Joaquin valley with an unfailing supply of water. Many more suitable places for dams are known to exist in the counties visited.

Business-Like and With Dispatch.

AUBURN, PLACER CO., CAL., Oct. 20, 1889.

Dewey & Co.—DEAR SIRS: I received the patent for improvement in tool handle through your office all correct; also a copy of the PRESS with published notice of the same, for which accept thanks.

I can cheerfully say that everything in connection with the patent has been done in a business-like manner and with dispatch. Yours truly,

J. S. JAQUITH.

Assessment Notices.

Lapanta Consolidated Mining Company.

Location of principal place of business, San Francisco, California. Location of Works, Hawthorne Mg. Dist., Esmeralda Co., Nevada.

NOTICE is hereby given that, at a meeting of the Board of Directors, held on the 2d day of October, 1889, an Assessment, No. 2, of Two Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin, to the Secretary, at the office of the Company, Room 56, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 8th day of November, 1889, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the 21 day of December, 1889, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

J. STADTFELD, JR., Secretary.

Office, Room 56, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

Gray Eagle Mining Company, Location

and principal place of business, San Francisco, California. Location of Works, Placer Co., Cal.

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 16th day of October, 1889, an Assessment, No. 15, of Six (6) Cents per share was levied upon the Capital Stock of the Corporation, payable immediately, in United States Gold Coin, to the Secretary, at the office of the Company, Room 11, No. 303 California St., San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 18th day of November, 1889, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Tuesday, the 10th day of December, 1889, to pay the delinquent assessment, together with the cost of advertising and expenses of sale.

By order of the Board of Directors.

J. M. BUFFINGTON, Secretary.

Office, Room 11, No. 303 California St., San Francisco, California.

Dewey & Co.'s Scientific Press Patent Agency.



OUR U. S. AND FOREIGN PATENT AGENCY presents many and important advantages as a Home Agency over all others, by reason of long establishment, great experience, thorough system, intimate acquaintance with the subjects of inventions in our own community, and our most extensive law and reference library, containing official American and foreign reports, files of scientific and mechanical publications, etc. All worthy inventions patented through our Agency will have the benefit of an illustration or a description in the MINING AND SCIENTIFIC PRESS. We transact every branch of Patent business, and obtain Patents in all countries which grant protection to inventors. The large majority of U. S. and Foreign Patents issued to inventors on the Pacific Coast have been obtained through our Agency. We can give the best and most *reliable* advice as to the patentability of new inventions. Our prices are as low as any first-class agencies in the Eastern States, while our advantages for Pacific Coast inventors are far superior. Advice and Circulars free.

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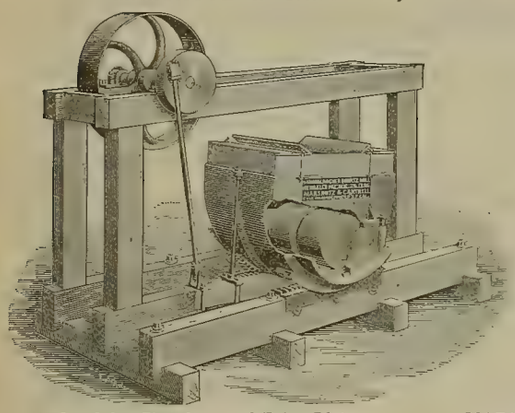
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6. There is no wear except on shoes and dies.
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GOLD SEPARATOR.

They are good machines. If the gold is in the dirt they will save it. They will save finer gold than water will.

T. J. SCOTT,
Osceola, Nevada.

Smith & Drew took out Tuesday, in their dry wash diggings, in addition to 5 ozs. of fine gold, a nugget weighing 22 ozs. The machine used was Freeman's Dry Process Separator.—*Utah Daily Union, May 10, 1889.*



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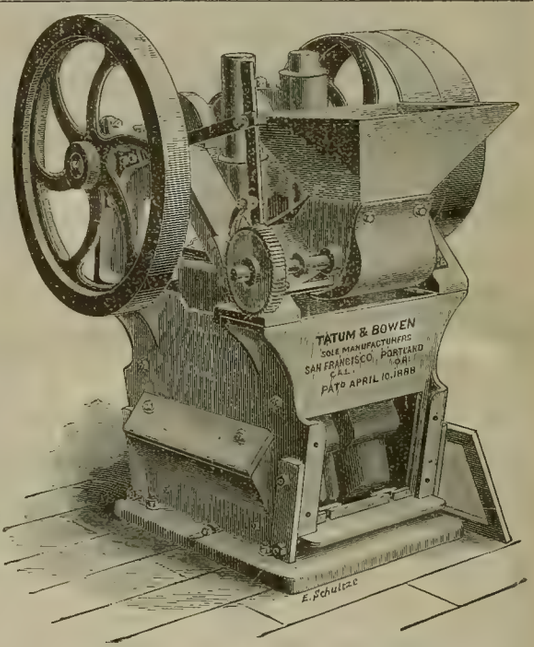
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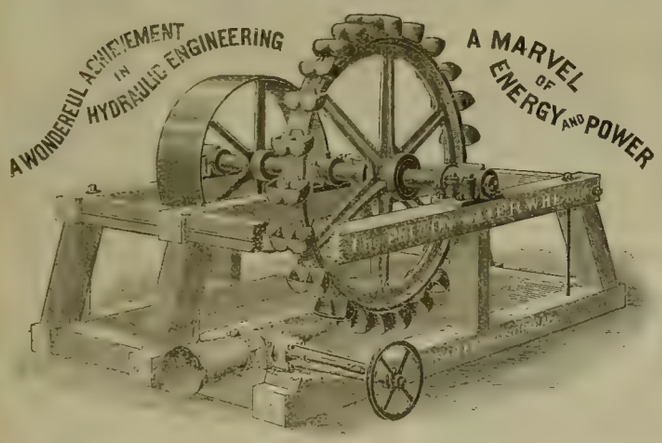
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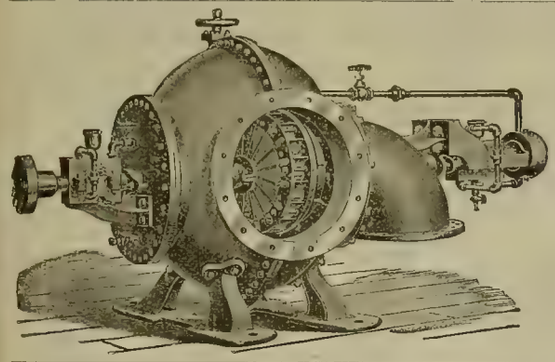
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Oct. 24, 1889.

The local money market is reported easy, although at the close there is a stronger market for sterling and New York exchange. The demand for crop purposes is about satisfied and in consequence remittances from the interior are increasing. The rains in the valleys and foothills with large deposits of snow on the mountain ranges have given ample water supply to start up many quartz-mills and hydraulic claims. Iron-workers report the receipts of fair orders for work, with the outlook of the most flattering character for next year's business. This opinion is grounded on a more liberal supply of water for mining purposes than has been had for several years, and also every probability of an easy money market in 1890.

MEXICAN DOLLARS—The market has held strong throughout the week at 76¾ to 76½ cts, By steamer leaving for China on Oct. 17th there went forward $142,079 shipped by Chinamen to Hongkong.

SILVER—The steamer that left on Oct. 17th for China took out the following shipments of bullion: To Shanghai, $73,000; Hiogo, $47,000; Japan, $234,000. Total, $354,000. Immediately following the sailing of the steamer, the London and New York market shaded off, causing buyers in our market to bid lower, but with holders indifferent sellers. With an advance in the English and Eastern markets this market appreciated in sympathy under fair buying orders and a scarcity of bullion. As there is an ample supply of water in Carson river, the mills on that stream, it is claimed, will soon start up on ore from some of the Comstock mines, but with the Carson and San Francisco mints coining standard dollars the supply of silver bullion available for export will not be materially increased. The Government bought silver at Omaha for coinage here. The price paid is private, but reported at 94 1-10 cts at Omaha, which makes it a fraction over 95 cts here. Our market closes strong to-day with 95 cts bid.

QUICKSILVER—Receipts the past week aggregate 374 flasks. The market is reported unchanged, but mine-owners anticipate a better home demand from now on, owing to a large supply of water for the mines. The shipments by overland railway in last month aggregate 101,900 pounds.

BORAX—Shipments the past month overland aggregate 805,370 pounds. The market continues strong, with a good Eastern demand ruling.

ANTIMONY—The market continues to rule strong at 20 cents. The East reports a continued scarcity, a good demand and a strong market.

LIME—Receipts the past week aggregate 3987 barrels. The home demand continues to fall off.

TIN—European mail advices report a very strong market at an advance for plate, but no essential change for pig. With us the market is quoted higher for prompt shipment and firmer, with no business for spot.

COPPER—In another department of this week's paper there appears a review of the situation abroad. Later mail advices report a strong market and a fairly active demand.

LEAD—The market is essentially unchanged. The general tone at the East is reported to be steadying, although the demand is, as yet, restricted to near-by wants.

IRON—The market is reported strong for both spot and to load. As far as we can learn, iron-workers generally, while not distressed for supplies, are willing to take any desirable parcels offering at concessions. Both the English and European markets are quoted active at higher prices.

The following are the latest comparative quotations f. o. b. at Glasgow:

F. o. b. Glasgow.	Oct. 10, '89.	Oct. 16, '89.
No. 1 Coltness	70s 6d	72s 6d
" Langloan	69s 0d	72s
" Summerlee	68s 6d	70s 6d
" Gartsherrie	67s 6d	70s 6d
At Ardrossa.		
No. 1 Eglinton	56s 0d	58s
" Glengarnock	65s 0d	67s 6d
" Dalmellington	57s 6d	58s

COAL—Imports the past week aggregate as follows: From Nanaimo, 714 tons; Coos Bay, 1250; overland, 80; Departure Bay, 2320; total, 4364 tons. Imports the past week were exceptionally light, but the heavy arrivals of coal-laden vessels in the forepart of this month gave us liberal supplies. While the local demand is not so pronounced, yet it is fairly active, with consumers purchasing ahead. The southern ports have been in the market for coal, owing to the light coal tonnage on the way to those ports. The last week several vessels were taken to load with coast coal for San Diego. High outward freights still rule in Australia, which are against any low prices for Australian coal.

Eastern Metal Markets.

By Telegraph.

NEW YORK, Oct. 24, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	42⅞	93½	$10 75	$3 90	$20 90
Friday	42⅞	93½	10 75	3 90	20 90
Saturday	42⅞	93½	10 75	3 90	20 90
Monday	43	93⅝	10 70	3 80	20 90
Tuesday	43¼	93⅝	10 75	3 80	20 75
Wednesday	43⅜	93⅝	10 85	3 80	20 90

NEW YORK, Oct. 23.—Borax supply is light and old rates firm. Quicksilver is easier in tone, 68@69c. No quotable change in copper. Pig lead is weak under the announcement that there is no variation in the tariff. Spot, $3.80@3.85; for October, November and December, $3.75@3.80.

THE *Kern County Californian* says: The railroad company is laying steel rails over the Tehachipi mountains that weigh 70 pounds to the yard. These are the heaviest ever used in the West, and are American steel, made at Scranton, Penn,

San Francisco Metal Market.

WHOLESALE.

THURSDAY, October 24, 1889.

ANTIMONY	19 @ 20
BORAX—Refined, in carload lots	7¼@ 7½
Powdered " " "	7¼@ —
Concentrated " " "	— @ 6¾
All grades jobbing at an advance.	
COPPER—	
Bolt	21 @ 22
Sheathing	22 @ 24
Ingot, jobbing	15 @ 16
do, wholesale	13 @ 14
Fire Box Sheets	22 @ 24
LEAD—Pig	4½@ —
Bar	5 @ —
Sheet	7 @ —
Pipe	6 @ —
Shot, discount 10% on 500 bags Drop, ℔ bag	1 45 @ —
Buck, ℔ bag	1 65 @ —
Chilled, do	1 85 @ —
STEEL—English, lb	16 @ 20
Canton tool	9 @ 9¼
Black Diamond tool	9 @ 9½
Pick and Hammer	8 @ 10
Machinery	4 @ 5
Toe Calk	4½@ —
TINPLATE—B. V., steel grade, 14x20, P. S	4 90 @ —
B. V., steel grade, 14x20, spot	4 90 @ 4 —
Charcoal, 14x20	6 25 @ 6 75
do roofing, 14x20	5 12½@ 5 25
Pig tin, spot, ℔ lb	21 @ 21½
COKE—Eng., ton, spot, in blk & sks, reaptvly	17 00 @20 00
Do, do, to load	13 50 @14 50
QUICKSILVER—*By the flask*	— @47 50
Flasks, new	@ —
Flasks, old	35 @ —
CHROME IRON ORE, ℔ ton	10 00@— —

IRON—Glengarnock ton	Spot. 30 00 @— —	To Load. 29 @ —
Eglinton, ton	29 00 @— —	29 @ —
American Soft, No. 1, ton	— — @31 00	31@ —
Oregon Pig, ton	— — @30 00	— @ —
Clay Lane White	— — @26 00	26 @ —
Shotts, No. 1	30 00 @30 00	— @ —
Bar Iron (base price) ℔ lb	2½@ 3	— @ —
Langloan	30 00 @— —	30 @ —
Thorncliffe	30 00 @— —	30 @ —
Gartsherrie	30 00 @— —	30 @ —

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$20 00	$17 00
41 to 50 ft	21 00	18 00
51 to 60 ft	23 00	20 00
61 to 70 ft	27 00	21 00
1x3, fencing	22 00	19 00
1x4, "	21 00	18 00
1x3, 1x4 and 1x6, odd lengths	19 00	16 00
Second quality	17 00	15 00
Selected	24 00	22 00
Clear, except for flooring	31 00	28 00
Clear for flooring	2 00	.....
Clear V. G. No. 1 flooring	6 00	.....
Firewood	14 00	10 00
Dressed Pine, flooring, No. 1, 1x6	32 00	29 00
No. 1, 1x4	34 00	30 00
No. 1, 1¼x4, 1¼x6, and odd sizes	37 00	33 00
All sizes, No. 2	27 00	24 00
Stepping, No. 1	44 00	35 00
Stepping, No. 2	34 00	28 00
Ship timber and plank, rough	27 00	18 00
Selected, planed 1 side, av'ge 40 ft	29 00	24 00
" " 2 " " " "	31 00	26 00
" " 3 " " " "	33 00	28 00
" " 4 " " " "	35 00	30 00
Deck plank, rough, average 35 ft	35 00	32 00
Dressed, average 35 feet	40 00	35 50
Pickets, rough, B. M	20 00	16 00
1x1½, 4 ft long, ℔ M	6 50	5 00

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	7 75 @ 8 00	Cardiff	9 50@10 00
Liverpool St'm	8 50 @— —	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	9 00 @ 9 00	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Gilman	7 00
Scotch Splint	9 00	Seattle	7 00
Greta	9 00	Coos Bay	6 00
Westminster Brymbo	9 00	Cannel	11 00
Nanaimo	9 00	Egg, hard	18 00
Sydney	8 50	Cumberland, in sacks	19 00
Jackson	6 00	do, bulk	18 00

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, department 10, San Francisco:

CALIFORNIA CONTRACTING CO., Oct. 19. Object, to conduct a general building business of houses, bridges, canals, etc. Capital stock, $100,000. Directors—A. J. Hughes, Rhodes Borden, I. L. Borden, J. A. Fairchild and W. E. Brown.

SAN FRANCISCO STREET-INDICATOR CO., Oct. 19. Object, to utilize an invention of H. G. Krasky. Capital stock, $250,000. Directors—Henry G. Krasky, Frank van Deventer, James H. Anderson, G. F. Ochs and E. P. Farnsworth.

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Eureka Cons., Oct. 22, $24,000; Mt. Diablo, 22, $6438; Cons. California and Virginia, 19, $60,349; Butte and Boston, 17, $25,344; Hanauer, 19, $2775; Lexington, 19, $27,848.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

EUREKA CONSOLIDATED. — At the annual meeting of the Eureka Con. mining company the following officers were elected to serve during the ensuing year: Wm. Fries, Pres.; P. N. Lilienthal, V. P.; H. P. Bush, Sec.; and D. Friedenrich and F. A. Benjamin, trustees. The Anglo-Californian bank was appointed treasurer. The financial statement showed the assets of the company to be $125,000, the liabilities, $38,000, the net assets being $87,000,

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Belcher M Co	Nevada	13	50	Oct 17	Nov 20	Dec 11	John Crockett	327 Pine St
Best & Belcher M Co	Nevada	34	25	Sept 11	Oct 16	Nov 6	L Osborn	309 Montgomery St
Central California Oil Co	California	1	50	Sept 6	Nov 1	Nov 18	F L Gorlinski	314 California St
Cisdmus M Co	Nevada	—	20	Sept 19	Oct 31	Nov 25	J Craig	204 California St
Chicago M & M Co	California	2	15	Sept 13	Oct 18	Nov 4	W Grant	520 Montgomery St
Crown Point M Co	Nevada	52	50	Sept 18	Oct 21	Nov 11	J Newlands	329 Pine St
Del Norte Gravel M Co	California	2	7	Aug 24	Oct 3	Oct 26	J B Cronan	230 Montgomery St
Grand Prize M Co	Nevada	22	30	Sept 24	Oct 28	Nov 19	E R Grayson	327 Pine St
Golden Jacket M Co	Nevada	3	10	Oct 14	Nov 21	Dec 20	E G McClellan	331 Montgomery St
Golden Prize Con M Co	Nevada	3	25	Sept 21	Oct 26	Nov 16	C D Bennett	330 Pine St
Gould & Curry M Co	Nevada	63	30	Oct 15	Nov 18	Dec 11	A Durbrow	399 Montgomery St
Gray Eagle M Co	California	15	6	Oct 16	Nov 18	Dec 10	J F Buffington	303 California St
Lvermore Coal M Co	Ca ifornia	1	50	Sept 18	Oct 19	Nov 6	G C Higgins	120 Sutter St
Locomotive M Co	Arizona	5	5	Oct 19	Nov 25	Dec 17	A H Fish	309 Montgomery St
Lapanta Con M Co	Nevada	2	02	Oct 2	Nov 3	Dec 2	J Stadfeldt	309 Montgomery St
Mexican M Co	Alaska	1	25	Oct 11	Nov 11	Dec 2		
North Belle Isle M Co	Nevada	16	20	Sept 18	Oct 22	Nov 13	J W Few	310 Pine St
North Bonanza M Co	Nevada	9	10	Sept 17	Oct 26	Nov 14	J F Bolling	410 Montgomery St
Oak Con M Co	California	4	7	Sept 5	Oct 10	Nov 20	E J Ryan	230 Montgomery St
Peer M Co	Arizona	8	10	Sept 4	Oct 10	Nov 5	A Waterman	309 Montgomery St
Potosi M Co	Nevada	33	50	Sept 18	Oct 22	Nov 12	C E Elliott	309 Montgomery St
Platt & Gil on G M Co	California	3	4 00	Sept 11	Oct 15	Nov 4	C Herrman	326 Kearney St
Peerless M Co	Arizona	13	10	Oct 11	Nov 19	Dec 10	A Waterman	309 Montgomery St
Scott Bar M & M Co	California	3	10	Sept 10	Oct 31	H Pink		309 Montgomery St
Silver Hill M Co	Nevada	25	20	Sept 27	Oct 31	Nov 21	D C Bates	309 Montgomery St
Sierra Nevada	Nevada	96	50	Oct 5	Nov 3	Dec 7	E L Parker	309 Montgomery St
Seg Belcher & Mides Co	Nevada	4	25	Oct 7	Nov 4	Dec 8	E A Holmes	309 Montgomery St
Tuscarora Con M Co	Nevada	2	10	Oct 12	Nov 15	Dec 5	J Scoville	309 Montgomery St
True Con M Co	California	7	2½	Aug 31	Oct 12	Nov 16	J C Bates	434 California St
Union Con M Co	Nevada	39	25	Oct 8	Nov 9	Dec 13	J M Buffington	303 California St
Vine Spring M Co	California	1	15	Oct 10	Nov 11	Dec 9	F S Snell	218 Sacramento St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Candelaria Con Mexican M Co	C S Givens		221 Market St	Annual	Oct 28
Estaca Con Mexican M Co	C S Givens		221 Market St	Annual	Oct 28
Mayflower Gravel M Co	California	J Morizio	323 Montgomery St	Annual	Oct 31
Occidental Con M Co	Nevada	A K Durbrow	309 Montgomery St	Annual	Nov 4
Alpha Con M Co	Nevada	G E Elliott	309 Montgomery St	Annual	Oct 29
California Slate Co	California	J O Hanscom	9 Mission St	Special	Nov 25

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Champion M Co		T Wetzel	522 Montgomery St	10	Oct 15
Caledonia M C	Nevada	A S Cheminant	328 Montgomery St	08	Aug 5
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	Sept 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	Aug 25
Idaho M Co	California		Grass Valley	5 00	Oct 7
Mt Diablo M Co		Nevada R Heath	319 Pine St	30	Oct 21
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Sept 10

Mining Share Market.

Under strong bear points, the banks calling on brokers to strengthen their accounts and the brokers in turn calling on their customers for more money to keep their margins good, had a depressing influence on the market, and as prices shaded off under outside selling, further calls for money to keep up margins were in order, which naturally threw large quantities of stock on the market. With the close of business on Tuesday a steadier tone set in for the Comstocks that was followed by a slight advance yesterday (Wednesday) under confirmed reports of heavy rains in Storey county and sufficient water in the Carson river to admit of the mills starting up on or about November 1st. There is water enough to allow the Nevada mills to start up soon. The bears are not happy, owing to prices not having shaded off enough, but they affirm that the low prices should come within the next ten days. The bulls, while trying to look satisfied, are nevertheless far from confident in their position, yet they affirm that not only large lines of margins have been uncovered, but large quantities of stock carried by outside parties have been sold, owing to the assessments to be paid. In outside stocks the market has been dull and heavy, as if the manipulators are waiting for an upward move in the Comstocks, so as to sell their holdings out at an advance.

From the mines reliable private advices are hard to get. It looks as if the manipulators are doing all they can to depress the Comstocks and purposely keep back news. The crushing of Savage and Hale and Norcross ore is to be resumed about November 1st. It is also stated that two or more of the Gold Hill mines will also soon send ore to the mills. Yellow Jacket ore to the extent of 100 tons a day is now being milled. It runs in assay about $25 a ton. Now that there is plenty of water, Potosi ought to begin soon to take out ore for milling. It is generally claimed that after next week very important work will be inaugurated on the Comstock, much of which has heretofore been noted in these columns. From the outside mines there are confirmatory advices of an improvement in two of the Quijotoa mines. From the Tuscaroras and Bodies there is nothing new to report, last week's advices virtually covering this week's.

The market opened this (Thursday) morning at higher prices for the Comstocks and barely steady for outside stocks. As there were selling points out, outside holders were free sellers. After the boom prices shaded off under fairly active business. There is an agreement between the managers of the Gold Hill and Alta groups of mines to pump the mines to the lower levels and divide the expenses pro rata. With a confirmation of this agreement by the board of directors of each mine in interest, pumping will be inaugurated as soon as possible thereafter. Virginia city papers report rains and snow for several days past in the mountain ranges on the Nevada side; they also state that the Comstock Tunnel Co. will commence work at an early day to extend the tunnel farther west. This work will be inaugurated in the Savage ground. This confirms our statement regarding contemplated work made fully two months ago.

IN ALASKAN WILDS.—A. Ingram and F. C. Young starved to death on the Takeenor, a tributary of the Yukon river, Alaska. Their provisions had given out and they had lost the trail. Their companions on the prospecting trip, R. C. Rose and J. W. Sperry, kept on and were saved, having traveled 600 miles on foot. They found a cache of 53 dried salmon on which they lived until settlements were reached.

OBSERVATORY SITES. — Says the Pomona *Times:* Parties representing Harvard University in the matter of locating observatories are expected here to investigate the feasibility of locating an observatory on Mt. San Antonio, or on some of the adjacent peaks. The energies of these parties are now directed to the selection of the best site before the observatory is permanently located.

John Kelley, superintendent of the Bodie, Mono and Bulwer mines, is in this city.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 4.		WEEK ENDING Oct. 11.		WEEK ENDING Oct. 18.		WEEK ENDING Oct. 25.	
Alpha	1.30	1.35	1.20	1.30	1.05	1.25	1.00	1.15
Alta	2.15	2.35	2.20	2.25	1.85	2.30	2.00	2.30
Andes	.70	.75	....	....	.60	....	.55	.60
Belcher	2.70	2.90	2.50	2.70	2.25	2.60	2.00	2.30
Best & Belcher	3.30	3.50	3.20	3.40	3.05	3.35	2.80	3.10
Bullion	.60	.65	.55	.55	.50	.60	.50	.55
Bodie Con	.70	.80	.70	.85	.65	.80	....	....
Benton	....	....	....	....	3.25	....	....	....
Bulwer	.30	.30	.30	.30	.25	....	.15	.30
Commonwealth	3.10	....	3 05	3.30	2.95	3.20	2.95	3.00
Con. Va. & Cal	6⅝	6⅞	6	6⅝	5¼	6⅛	5¼	5¾
Challenge	2.70	2.90	2.75	2.80	2.25	2.65	1.90	2.10
Chollar	1.85	1.90	1.55	1.75	1.55	1.70	1 45	1.65
Confidence	6¾	7	6¾	6⅞	6.25	6.75	5.00	....
Con. Imperial	.40	.45	.40	.45	.35	.45	.30	.35
Caledonia	.25	....	.20	....	....	....	....	....
Crown Point	2.50	2.85	2.25	2.55	2 05	2.20	2.00	2.50
Crocker	.50	.60	.50	.55	.40	.50	.45	....
Eureka Con	3.00	3.25	3.00	5.50	3.20	4.00	3.60	4.50
Exchequer	.50	.60	.50	.55	.50	.55	.55	....
Grand Prize	.50	....	.50	.65	.55	.70	.55	.60
Gould & Curry	1.95	2.05	1.90	2.05	1.55	1.90	1 35	1.55
Hale & Norcross	3.00	3.30	2.75	3.05	2.75	3.00	2.75	2.95
Julia	....	....	....	....	.20	....	.20	....
Justice	.65	1.70	1.55	1.70	1.35	1.55	1.40	1.50
Kentuck	1.25	1.30	1.15	....	1.15	1.15	1.00	....
Lady Wash	....	....	.40	....	....	....	.35	....
Mono	.70	.80	.75	.80	.60	.70	.40	.55
Mexican	3.75	4 20	3.60	4.00	3.40	3.80	3.10	3.60
Navajo	.30	....	.35	.40	.30	....	.35	....
North Belle Isle	.55	.70	.75	.80	.70	.75	.70	.90
Nev. Queen	.60	.65	.65	.85	.60	.75	.90	....
Occidental	1.45	1.50	1.40	1.45	1.10	1.30	1.00	1.15
Ophir	4.30	4.95	4.50	4 80	4.05	4.55	3.70	4.20
Overman	1.10	1.30	1.05	1.15	.90	1.05	.80	.95
Potosi	1.30	1.45	1.25	1.35	1.10	1.25	1.05	1.60
Peerless	.30	.40	.30	.35	.25	.30	.20	....
Peer	.10	.10	.10	.20	....	....	....	....
Savage	2 00	2 30	1.75	2.05	1.55	1.75	1.60	1.70
S. B. & M	1.65	1 85	1.35	1.60	1.15	1.40	1.05	1.15
Sierra Nevada	2.60	2.85	2.20	2.60	....	....	1.55	1.90
Silver Hill	.30	.35	.25	....	.15	.20	.15	.20
Scorpion	.20	.30	.20	....	.25	....	.25	....
Union Con	3.00	3.3.	2.95	3.10	2.80	3.00	2.60	2.85
Utah	.95	1.05	.90	.95	.85	.90	.65	.85
Weldon	....	....	....	....	.20	....	....	....
Yellow Jacket	3.10	3.40	3.05	3.25	2.90	3.15	2.75	2.95

Sales at San Francisco Stock Exchange.

THURSDAY, Oct. 54, 9:30 A. M.

250	Alta	2.25	
150	Andes	.60c	
500	Alpha	1.25	
220	Belcher	2.40	
250	B. & Belcher	3.05	
50	Bullion	.55c	
100	Challenge	2.15	
30	Confidence	6.37½	
150	Crown Point	2.60	
100	Con. Imperial	.35c	
200	Con Va & Cal	5.62½	
300	Exchequer	.55c	
150	Grand Prize	.55c	
250	Gould & Curry	1.50	
200	Hale & Nor	3.00	
550	Julia	.20c	
350	Justice	1.45	
235	Mexican	3.45	
100	Mono	.50c	
50	Occident	1.10	
250	Ophir	4 15	
100	Overman	.90c	
50	Peerless	.25c	
300	Potosi	1.50	
200	Savage	1.60	
300	Scorpion	.25c	
270	S. B. & M	1.20	
200	Sierra Nevada	1.75	
630	Silver Hill	.15c	
200	Union	2.90	
300	W Comstock	.25c	
90	Yellow Jacket	2.85	

For New Subscribers—Something New and Rare.

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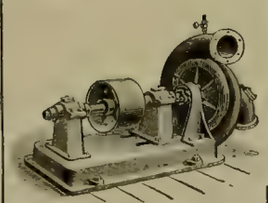
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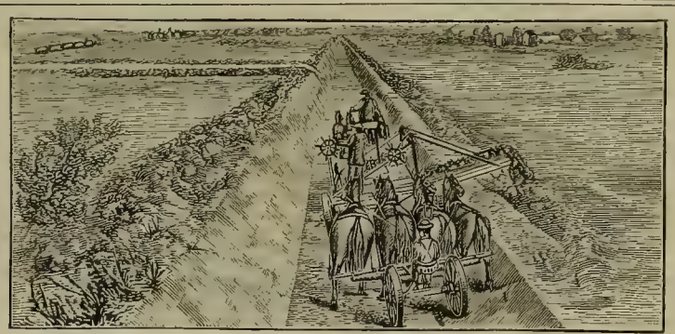


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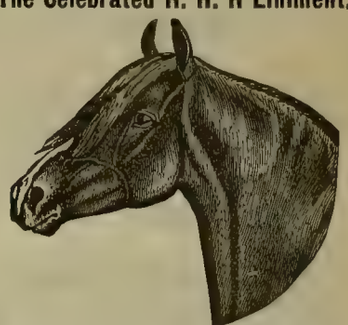
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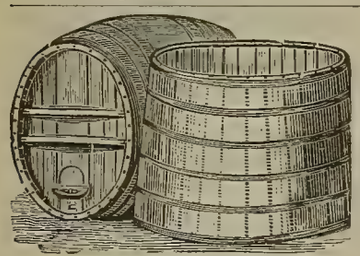
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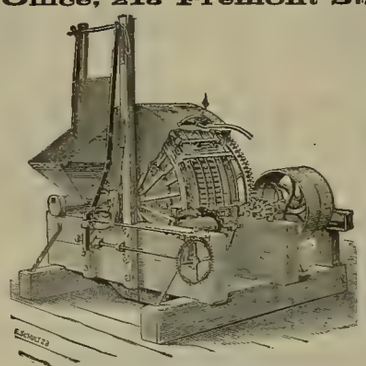
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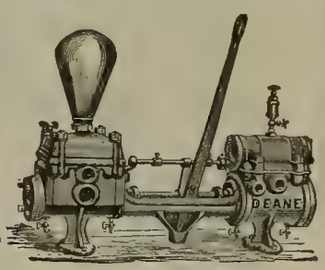
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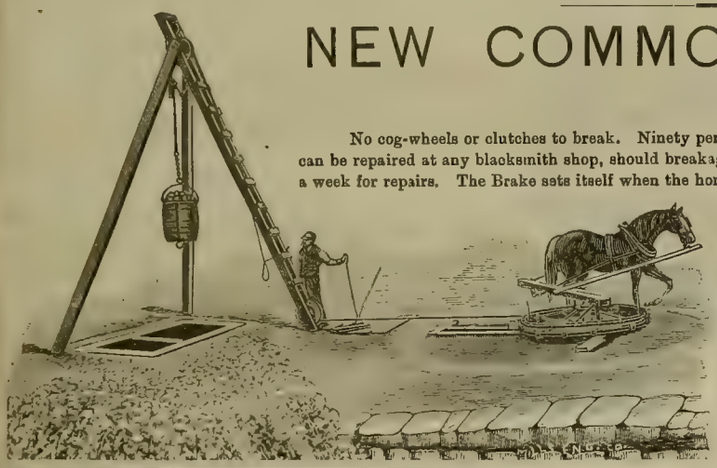
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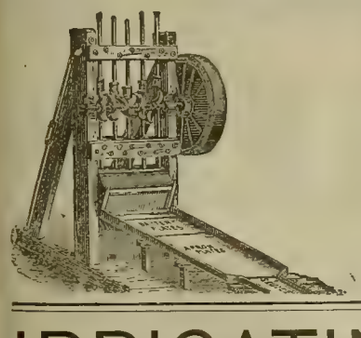
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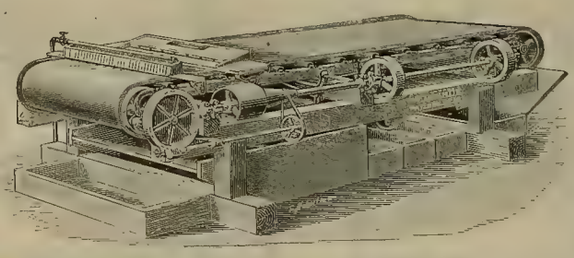
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Protected by Patents December 22, 1874; September 2, 1879; April 27, 1880; March 22, 1881; February 20, 1883; September 18, 1883; July 24, 1888. Patents applied for.

There are Over 2200 Plain Belt Machines now in Use.

THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

ADAMS & CARTER, Agents [illegible]E VANNING MACHINE CO., Room 15, No. 132 Market Street, San Francisco, Cal.

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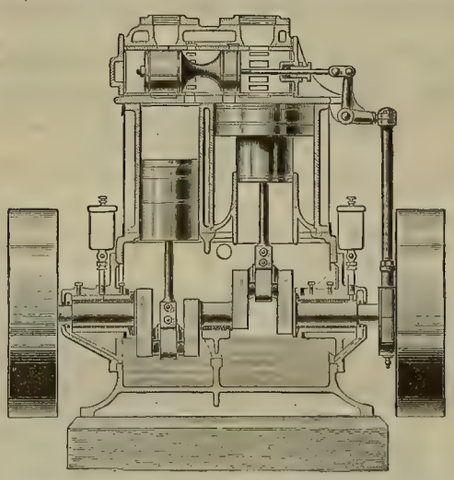
PARKE & LACY COMPANY

—IMPORTERS AND MANUFACTURERS OF—

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TURBINE WATER WHEELS,
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Golden Gate Concentrators,
GREATEST CAPACITY
OF ANY CONCENTRATOR MADE,
One Machine Taking Pulp from 10 Stamps.



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SALES DURING LAST FOUR MONTHS:

COMPOUND, 44 ENGINES, 5215 HORSE POWER. STANDARD, 99 ENGINES, 4500 HORSE POWER. JUNIOR, 166 ENGINES, 4260 HORSE POWER.

Grand Total, 309 Engines, Aggregating 13,975 Horse Power.

21 and 23 Fremont St., San Francisco, Cal. 189 Clarence St., Sydney, N. S. W.

PACIFIC IRON WORKS

1850. —BUILDERS OF— 1888.

MINING MACHINERY.

GENERAL OFFICE AND WORKS:
127 First St., San Francisco, Cal., U. S. A.
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PLANTS FOR GOLD AND SILVER MILLS, embracing machinery of LATEST DESIGN and MOST IMPROVED construction. We offer our customers the BEST RESULTS OF 38 YEARS' EXPERIENCE in this SPECIAL LINE of work, and are PREPARED to furnish the MOST APPROVED character of MINING AND REDUCTION MACHINERY, adapted to all grades of ores and SUPERIOR to that of any other make, at the LOWEST POSSIBLE PRICES.

We are also prepared to CONSTRUCT and DELIVER in COMPLETE RUNNING ORDER, in any locality, MILLS, CONCENTRATION WORKS, WATER JACKET SMELTING FURNACES, HOISTING WORKS, PUMPING MACHINERY, ETC., ETC., of any DESIRED CAPACITY.

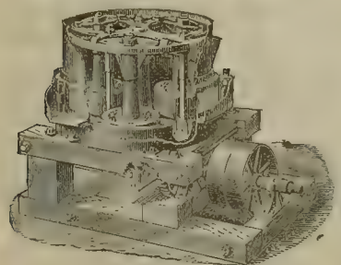
THE GATES CRUSHER

Is beyond all question the most important improvement that has ever been made in this class of mining machinery. It will do more than twice the work with a given amount of wear than any other Crusher made, besides crushing so much finer that for mining uses, the capacity of the mill is greatly increased. It has the same relative superiority for macadamizing purposes, affording the cheapest and most reliable machine for this use.

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CENTRIFUGAL ROLLER QUARTZ MILLS,

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LIX—Number 19.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, NOVEMBER 2, 1889.

Three Dollars per Annum.
Single Copies, 10 Cts.

The Wenstrom Magnetic Ore-Separator.

Tho only magnetic separating machine which has actually taken the place of hand-picking in the iron mines of Sweden, was designed and patented by Jonas Wenstrom of Oretro, Sweden. It has also been successfully adopted by the Lackawanna Iron and Coal Co. of Scranton, Pa., where the fine waste before it goes to the dump is put over this separator. It is useful for treating cinder from the Bessemer converters. In this machine (in which soft iron becomes magnetized by induction) the barrel is made up of soft iron bars and wood which is rotated around a stationary shaft by a cog-wheel. Inside of this barrel on the shaft is placed eccentrically a cylindrical electro-magnet, provided with a number of flanges (*N. S.* Fig. 1), between which wire is wound so the flanges are of negative and positive polarity, being energized by a current passing through the wire coils from a small dynamo. As will be seen in Fig. 1, the flanges, *N*, *S*, are circular, and follow the internal contour of the barrel on the front side, while on the opposite side they are cut down to the line *B*, *B'* in Fig. 2. Hence the bars of the revolving barrel on the front side of the machine are magnetic only while passing from *B* to *B'*; and after they pass the point *B'* in the lower part of the machine, they cease to be so, and remain entirely without magnetism in passing through the space from *B'* to *B*, at the back of the machine. The bars have alternately two and three projections coming close to the polar flanges, so that each bar becomes virtually a prolongation of the magnetic poles.

The ore and rock are fed on top of the revolving barrel, coarse and fine together, and the ore adheres to the barrel during half a revolution, being only released after it has passed out of the magnetic field *B'*; the non-magnetic material rolls off the barrel and falls in front of the dividing-board, while the magnetic material drops off behind it.

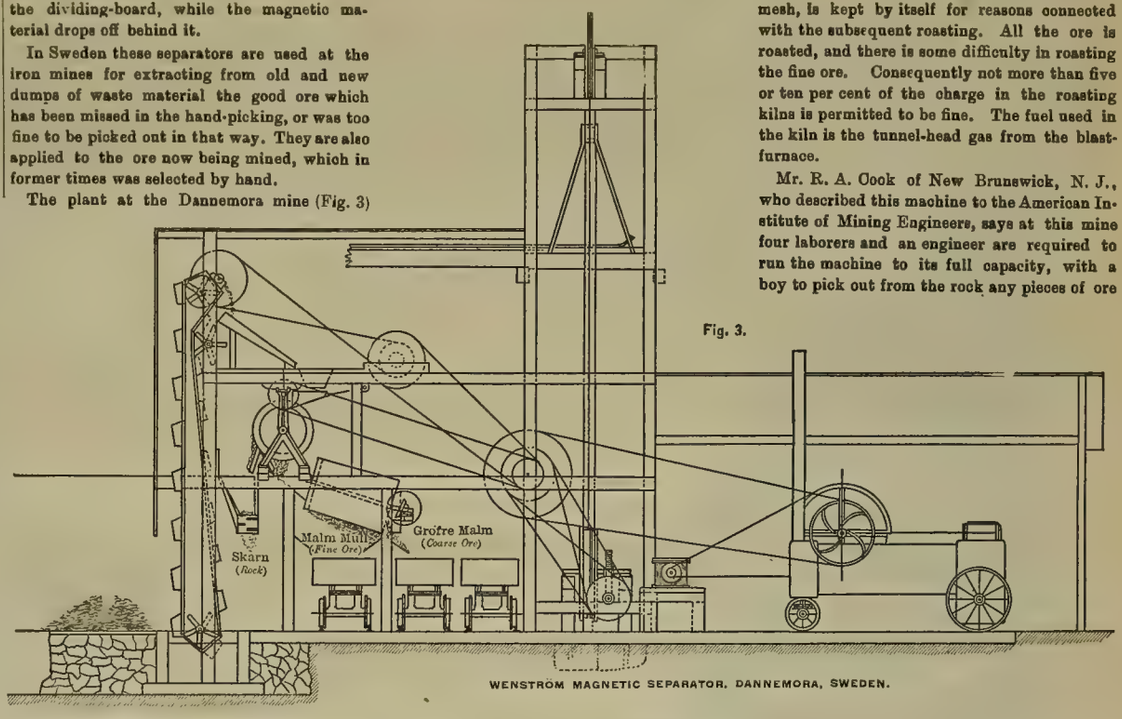
In Sweden these separators are used at the iron mines for extracting from old and new dumps of waste material the good ore which has been missed in the hand-picking, or was too fine to be picked out in that way. They are also applied to the ore now being mined, which in former times was selected by hand.

The plant at the Dannemora mine (Fig. 3) consists of a separator, 24 inches on the face and 27 inches in diameter, a small dynamo and a portable engine, which runs not only the separator but also a bucket elevator and a hoist capable of raising a car loaded with half a ton of ore. The material (anything below a four-inch mesh) is dumped from a trestle at the elevator, which conveys the material to the feed of the separator, and the separated rock falls into a chute, and is thence delivered into a car and run off to the waste dump. The ore runs down into a barrel screen of perforated steel, the holes being one inch in diameter. The pieces which pass through fall into one car, while the coarser portions fall into another. These cars are then hoisted on the elevator and run off to the point of shipment. The fine stuff, below one-inch mesh, is kept by itself for reasons connected with the subsequent roasting. All the ore is roasted, and there is some difficulty in roasting the fine ore. Consequently not more than five or ten per cent of the charge in the roasting kilns is permitted to be fine. The fuel used in the kiln is the tunnel-head gas from the blast-furnace.

Mr. R. A. Cook of New Brunswick, N. J., who described this machine to the American Institute of Mining Engineers, says at this mine four laborers and an engineer are required to run the machine to its full capacity, with a boy to pick out from the rock any pieces of ore which may have been mechanically knocked off by larger pieces of rock.

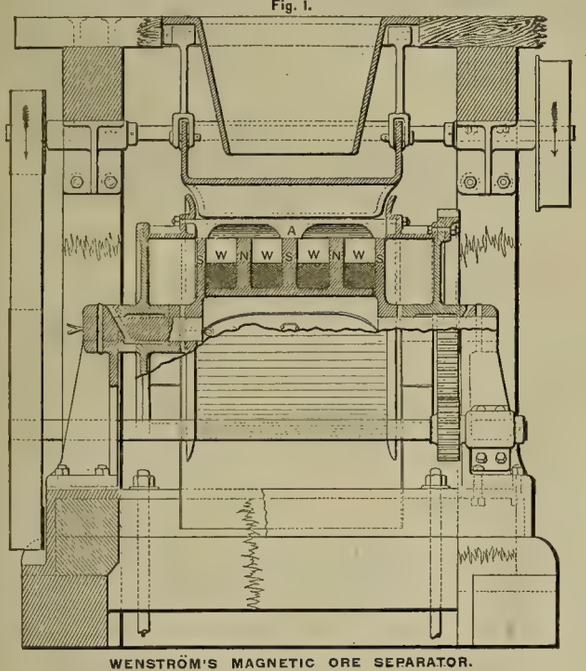
There are other uses to which this magnetic separator has been profitably applied in Sweden. One is that of separating the pieces of iron from the dirt, in yards where pig iron has been stored, or from any old heaps of waste material —for instance, where the dumpings from cupolas have been piled.

Fig. 3.



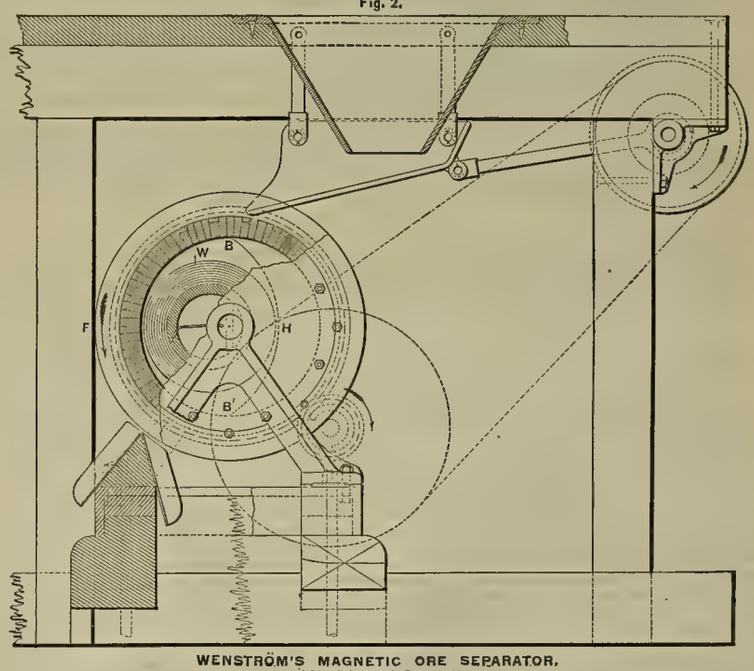
WENSTRÖM MAGNETIC SEPARATOR, DANNEMORA, SWEDEN.

Fig. 1.



WENSTRÖM'S MAGNETIC ORE SEPARATOR.
CROSS SECTION
Scale: 1 in. = 1 foot.

Fig. 2.



WENSTRÖM'S MAGNETIC ORE SEPARATOR.
LONGITUDINAL SECTION
Scale: 1 in. = 1 foot.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Tuolumne County.

Items of Interest from Sonora.

EDITORS PRESS:—The miners of old Tuolumne need no longer grumble that base-ore mines of any value have to remain idle, in consequence of there being no means at hand for the reduction and treatment of their sulphurets, for I am pleased to be able to state that this county has now a very complete and efficient chlorination outfit just erected outside of the town of Sonora, on the Summersville road, by the owner, Mr. A. Maltman. The mining community is to be congratulated on securing the valuable services of the above gentleman, for he is a thoroughly competent and experienced metallurgist, chemist and assayer. The want of such works has been long felt, and many valuable mines have been shut down, as there were no means nearer than Amador county to treat custom sulphurets; besides, all samples of rock or bases had to be sent to San Francisco for assaying, there being no office for the latter in the county. Now the presence of Mr. Maltman is a real boom for us all, and he being well equipped, must succeed and give general satisfaction. Aside from this, quantitative analysis of any substance, rock, metal, water, etc., can be determined and attended to in person by Mr. Maltman.

I will now briefly describe the chlorination works. The main building is 116x30 feet, graded in floors downward toward the creek at the back, with a frontage on the main road upward. The first floor is the receiving and weighing room for the crude sulphurets. The second floor contains the reverberatory furnace, 40x12 feet, most strongly braced transversely and laterally. A double-lined iron smokestack of considerable hight conveys the fumes, gases, etc., far away. I may here mention the furnace contains some special improvements over the ordinary old reverberatory—firstly, producing a more even combustion, promoted by the admission of oxygen in the right place, and an arrangement of the floor by which the sulphur from the last added charge helps to provide fuel and finish the roasting of the prior charge, and so on till completed. I am not at liberty to disclose further the modus operandi. Then again, no troublesome smoke is seen issuing from the ports or doors, making it an easy matter to rake forward or otherwise the molten mass, which is most perfectly roasted and desulphurized; being devoid of any cinder, it now passes to the cooling floor, therefrom to the vats, in the right condition to receive the chlorine. The process is the hyposulphite for leaching silver, and used in conjunction in the chlorination of gold. Mr. M. makes his own chemicals used in his works, from the crude material.

Assaying and scorification charges are moderate. Cost of reduction per ton $20 to melting into gold bar, and 90 per cent guaranteed of the assay value. Same for 30 or 100 tons. Water is laid into the works from an altitude of 150 feet. Office and assaying room is attached to or adjoins the main building. The owner contemplates making further additions and improvements later on. The works are kept steadily at work.

I trust all mine-owners will patronize Mr. Maltman that he may in the near future be able to enlarge his premises. Present capacity, 4500 pounds. I had the pleasure to inspect plans gotten up by Mr. Maltman for the Grant, Treadwell & Co. mines at Alaska. Capacity, 14 tons daily, for a reverberatory furnace of his own design, similar to the one built at the works described, which speaks well for his ability in his profession, and for the superiority of his furnace.

From the Bonanza mine of Sonora has been taken out to date considerably over $100,000 in the old works, and not yet cleaned up; but on a more westerly crossing the lucky lessees have constructed fine hoisting works 60x30 feet and are sinking an incline shaft about 70 degrees to connect old works, or rather to enable them more cheaply to work the chute below the old works, which will give them considerable backs of several hundred feet, and by means of a powerful pump will be able to drain the mine and the chute from the point tapped upward. A new horizontal engine is just placed in position of increased power.

The mines generally depending on water-power are shut down, owing to the short-sighted and penurious system of the old Tuolumne Water Co., by not providing against a dry season by constructing large storage reservoirs high up in the mountains; but I am pleased to state they have partially awakened and have commenced to build a storage reservoir, which, I trust, by next fall will be completed. It can be if they put sufficient men on the work. This reservoir embraces many hundred acres of land and will, when completed, be a vast and profitable revenue, which, had it been undertaken several years ago, this county would be to-day in a more flourishing condition as regards its mines and ranches. Water is the grand desideratum, and a scarcity means loss, idle men and unproductiveness to every one. ARGUS.

The Proposed Mining Law.

EDITORS PRESS:—Having thoroughly examined the proposed new mining law, I find there is far from any improvement over the present one. In the first place, there will be entirely too many dates to observe. The present law, as regards the beginning of the assessment year, is all that any reasonable person can wish. There is winter at both ends of the year, and all summer in which to perform the necessary work.

No man who is self-sustaining enough to strike out to find something for himself should be restricted to one claim. It is not one time in a hundred that the first claim located is the best one in a camp. In this case, the proposed law would greatly decrease the prospector's rights, as well as encourage the camp-followers and do-nothings to follow a little in the rear of the prospector and rest on their oars until he found something; then a grand charge would follow, and the prospector would have no advantage whatever over the do-nothings. It is the industrious prospector's rights that should be fostered, and not the whisky ring. No doubt there can be some improvement on the present law.

As about all relocations are made on or about the first of the year, there is ample time for doing the required work the same year—in other words, do not allow any remnant of the year on any relocated claim. This would stop relocating to save doing assessment work.

An individual having more than one claim should have the right to concentrate his work all on one claim, provided he did, say, three or four times as much as it would require to scatter his work over all of his claims. A company may have the same privilege by doing a much larger amount of work.

This would be a stand-off to the present tunnel law, which grants about the same thing. It is a well-known fact that most of adjoining claims located by the same person are for self-protection, and not for the worth of the ground. E. H. R.

Eureka, Nev.

Shasta County Notes.

EDITORS PRESS:—The Iron Mountain Silver mine is running to its full capacity with 20 men employed. The ore is an iron cap, and the supply seems inexhaustible. About 20,000 ounces of bullion is shipped from the mill every month. James Sallee is superintendent.

Manzanita, the mine owned by Greenbaum & Levy, has suspended operations; the cause assigned being that the ore has given out. They have a five-stamp mill at Grizzly Gulch—a new plant run long enough to use up the 200 tons of ore taken from the mine.

The Niagara mine on French Gulch is producing well. This is the mine purchased of Mr. Coleman, of San Francisco, by the English and German syndicate.

Mr. Conant has recently purchased the Wheeler mine on Kline's gulch, and is working it.

The J. I. C., next to it, is a very promising mine. As yet it is hardly more than a prospect; 31 tons of ore produced $3200 worth of bullion.

The Gladstone comes next, and is another good one.

The Utah & California Gold Mining Co. (Walker Bros.) have just completed their new mill, near the Sacramento river, at Old Diggings. The location is excellent. The superintendent, H. D. Rippetu, furnished the plans and had charge of its erection. It is a model for convenience and economy in handling the ore. The work was done by Wm. Stephens, of Redding, who has built other mills in the vicinity, and speaks well for his ability as a mill-builder.

The work of clearing the ground was commenced on July 20th, and the mill started on October 6th. It has 10 stamps and uses a Blake crusher.

The Central mine, just above, is not being operated. Hart & Flemming employ 12 miners, and are running to their full capacity.

A very rich find is reported in the Mammoth, and San Francisco parties are negotiating for its purchase.

The Calumet is adding to its plant. The machinery used in the mill is almost entirely the invention of the superintendent, Mr. A. B. Paul, and has proved very successful.

Gold mining in this county is yet in its infancy. The country is being thoroughly prospected, and quite a number of promising finds are reported. All that is needed is capital to develop the treasure which lies hidden in its mountains. H. B. P.

OUR TWO GREAT PETROLEUM STATES.—Five years ago the production of petroleum in Ohio was hardly worth mentioning. Last year her production was 10,000,000 barrels, against 16,000,000 barrels for Pennsylvania, and this year it is believed that the production in Ohio will lead all other States.

A VEGETABLE CARTRIDGE SHELL, which is entirely consumed in firing, is a French novelty. With this shell the cartridge has scarcely half the weight of a metal cartridge, the cost is considerably less, and the inconvenience of removing the shell after each shot is avoided.

The Discovery of Gold.

Oregon has developed a "new" discoverer of gold in California. On the tombstone of Capt. Charles Bennett, in the Rural cemetery near Salem, it is recorded "that he was the discoverer of gold in California." Hon. Stephen Staats writes in the *West Side* newspaper and says: "As to the gold business, it is related that Marshall picked up something in the race at Sutter's mill, not knowing what it was, and showed it to Bennett, who examined the same and pronounced it gold. 'Why, that is gold!' was his exclamation. And this is the simple story of the discovery that may be said to have transformed society and worked such wonders in the material development of America, if not of the world. But the circumstance was merely fortuitous, and anticipated the events only a few months at the most. Adventurous Americans were beginning to enter California and roam over its wastes, and their sharp eyes would have soon detected the shining metal. But Captain Bennett was the discoverer of gold in California, nevertheless."

The real story of the "discovery of gold in California" has been told in the PRESS, as related by Marshall himself. It seems strange that Bennett's name was never linked with the discovery in any prominent way, and it is rather late to get any acknowledgment of his claim. The only other names connected with the occurrence are those of Sutter, Peter Weimer and Mrs. Weimer. Marshall and Weimer were together when the gold was found, the former picking up the piece of gold in the tail-race. According to their version, they thought it was gold, and finding more, kept the matter secret several days. Bennett is not mentioned by them or others. Marshall's statement is confirmed by Mr. and Mrs. Weimer. Sutter and all the hands at the mill Henry W. Bigler's diary or journal, the only written record, gives the date as Jan. 24, 1848. But Marshall put it at Jan. 19, 1848. This confusion of date is explained by the fact that Marshall and Weimer kept the matter secret several days, and Bigler recorded it when he heard of it. None of the participants of the event mention Bennett in any way.

The credit of the discovery doubtless belongs to Marshall, and always will. The State of California has lately erected a statue to his memory on a site near the point where the old mill stood.

It was this discovery which led to the rapid settlement of this State and the greatest gold excitement ever known to the world. Nevertheless, gold had been found in California long before, and was known to the Mexican Government. In 1844, Manuel Castanares, representative in the Mexican Congress from the Department of Upper and Lower California, published in Mexico the fact that placers had been discovered, and officially called attention to their importance. He said that in 1843 there were in circulation in Los Angeles about 2000 ounces of gold which had been taken from the placers near there. This had been taken out in 1842–3 Who made the original discovery no one knows; but it was that of Marshall that started the "California gold-fever" that resulted in the memorable "days of '49."

The Giant Madrona.

The genus really belongs to the Old World. Asia has its species, and Mexico claims one or two representatives, but the pride of the family and the delight of arboriculturists is the strong, healthy and handsome child of the west coast. It is often 80 to 100 feet high, 3 feet in diameter, and a famous specimen in Marin county has a measured girth of 23 feet at the branching-point of the tremendous stem, with many of the branches three feet through. The foliage is light and airy, the leaves oblong, pale beneath, bright green above. The bloom is in dense racemes of cream-white flowers; the fruit a dry, orange-colored berry, rough and uninteresting. But the charm of the madrona, outside of its general appearance, is in its bark—no, it is not a bark, it is a skin, delicate in texture, smooth and as soft to the touch as the shoulders of an infant. In the strong sunlight of the summer these trees glisten with the rich color of polished cinnamon, and in the moist shadow of the spring-time they are velvety in combination colors of old gold and sage-green. There is a human pose to the trunk. Seen through the tangle of the thicket, it looks like the brown, lithe body of an Indian, and in the moonlight the graceful upsweep of its branches is like the careless lifting of a dusky maiden's arms. Every feature of the madrona is feminine. They grow in groves or neighborhoods and seldom stand in isolation, courtesy to the winds, mock at the dignified evergreens and oaks, and with every favorable breeze and opportunity, flirt desperately with the mountain lilacs that toss high their purple plumes on the headwaters of Los Gatos creek.—*F. N. Somers in Oct. Harper's.*

A GERMAN SCIENTIST wishes to determine, by means of photography, if the moon is inhabited; and it is said that the King of Wurtemburg has decided, in order to solve the interesting problem, to cause to be made, in the best possible condition, photographs of the moon; then to enlarge the negative 190,000 times.

Bankrupt Law.

The National Bankruptcy Convention that recently assembled at Minneapolis, Minn., consisting of representatives from the commercial bodies of the United States, formulated a National Bankrupt law. The following are the salient points: Jurisdiction in bankruptcy proceedings is conferred upon the United States District Courts; the appointment of a referee at a salary of $3000 per annum is provided for, and a trustee is to be nominated by the creditors. The United States District Attorney must examine every bankrupt at the first meeting of creditors and also at the last meeting before the debtor is discharged. It is made the duty of that official to lay all questions of fraud before the Grand Jury. Fraudulent preferences are strictly forbidden. Valid liens created in good faith are protected. The bankrupt is allowed exemptions according to the State in which he lives. If he can show a faultless record and clean hands, he will be immediately discharged, no matter how small a dividend he may pay.

A committee was appointed by the convention to present these and other points to Congress in the shape of a bill, but judging from former efforts in this direction they have a big task on hand. Our experience in this matter has not been satisfactory. The Constitution of the United States authorizes Congress to establish "uniform laws on the subject of bankruptcy throughout the United States." A Bankrupt law was passed in 1800, limited to five years; but was repealed before it had been in operation three years. In 1841, another Bankrupt law was passed, and repealed 18 months afterward. In March, 1867, another Bankrupt law was passed, that was thought by the legal minds that framed it, to be so well adjusted in the light of past failures, as to prevent all fraud and insure justice to everybody, but it worked so badly that it was soon repealed.

The ideal of a bankrupt law looks wise and beneficent. It works uniformly all over the country. It helps the unfortunate debtor who honestly surrenders his property to receive a final discharge and go where he pleases to repair his fortunes. It can work no hardship toward the creditor, for all his dealings and contracts are made in the light of such a contingency.

But the chief complaint against such laws has been that proceedings in the District Courts of the United States are too cumbrous, liable to vexatious delay, and unnecessarily expensive and inconvenient. For instance, under the old Bankrupt law, so far as this State was concerned, the proceedings had to be commenced and the estate of the insolvent debtor closed up and distribution made in the District Court of the United States sitting in San Francisco. This made it very inconvenient and expensive for parties and witnesses at a distance. It also tended to create a monopoly of the legal business in the hands of a few lawyers, who, residing in the city of San Francisco, managed to get the ear of the Register and Court, and becoming experts in the forms and practice, fattened upon the spoils. The delays wore out the patience of all parties concerned, because the lawyers put off the final settlement as long as they could invent a plausible reason. It is hard to see how any national bankrupt law can be shaped so as to avoid these disabilities. In the nature of the case the proceedings will always have to be taken in some branch of the Federal Courts, and this will cause the burdens to bear heavily upon the majority who live at a distance. It would seem that for all practical purposes an insolvent estate may be as well closed up and distributed in the Superior Courts of the respective counties of the State, and it certainly can be done more promptly, at less expense and a great saving in time and trouble.

CIVIL ENGINEERS AND IMPROVEMENTS.—Three members of the Oakland City Council, W. W. Camron, president, and John Hackett and H. M. Collins, have been empowered by that body to select three civil engineers, who are to make a report as to the cost, etc., of mooted public improvements. It is probable that Colonel Mendell of the U. S. Engineer Corps will be nominated as one of the trio of experts.

THE Placer *Argus* says that the Auburn electric-light works will have a plant capable of 1000 incandescent lights and also an arc-light plant. They hope to be fully equipped by the middle of October. Their water force is taken from the Bear river supply by a ditch about 2400 feet long. Both dynamos will receive their force from turbine wheels. About 19 miles of wire in all will be placed.

A LOAD FOR WIRE ROPE.—The proper safe working load for wire rope is as follows: One-half inch in diameter, 1000 pounds; five-eighths inch, 1500 pounds; three-fourths inch, 3500 pounds; one inch, 6000 pounds. This is for 19 wires to the strand, hemp centers.

MRS. PAGE carries the mail twice a week between Neskowin and Grande Ronde, in Tillamook county, Oregon. The distance is 30 miles and she never fails to be on time.

A LARGE SAWMILL is to be put up at Slab creek, El Dorado county, to cut timber for a V flume to carry lumber to Folsom.

On the Nicaragua Route.

Preparations for building the inter-oceanic canal by the Nicaragua route seem to be progressing favorably. It is reported that the hitch in the proceedings which came about through lack of harmony between Nicaragua and Costa Rica, which have riparian rights on opposite sides of the stream which is to form a part of the canal, is said to have been adjusted, and credit is given to a Californian, Hon. L. B. Mizner, now U. S. Minister to Nicaragua, for efficient service in adjusting matters. Hardly too much can be said of the importance of the successful termination of this project to California interests, and we hope it will be speedily attained.

To gratify curiosity as to the character of the country through which the canal will pass, we have secured a number of authenticated views from the Government, representing the points especially noted by the engineers. One of these is presented on this page. It is of the San Juan river, at the junction of the San Francisco. The point is on the division between the eastern end of Lake Nicaragua and the Atlantic terminus at Greytown, and about one-third of this distance, westward from Greytown. The San Francisco is a stream of considerable volume, and has formed a part of the canal line as laid down by some surveys, there being a canal proposed from the San Juan to the basin of the San Francisco, thence for a considerable distance in the basin of the San Francisco, and thence by canal again to the terminus on the Caribbean sea. In using the basin of the San Francisco it is proposed to make an embankment about a mile and a quarter long connecting two high hills confining the valley of that stream and turning it into a large artificial lake, affording unrestricted navigation for eight and one-half miles, where ships can wait or pass each other. The water thus stored will be of much value in operating contiguous portions of the canal.

The engraving gives a good idea of the San Juan and San Francisco rivers in their lower portions. Higher up, the streams run between projecting mountain spurs and have some rapids and rippling flow, but as shown in the engraving the water is deep and slow, and the banks, broken only by low, isolated hills, are well covered with tangle of forest tree and vine peculiar to the lowlands.



ON THE NICARAGUA ROUTE—THE RIVER SAN JUAN AT THE MOUTH OF THE SAN FRANCISCO.

FOR CUTTING GOVERNMENT TIMBER.—In 1884 a judgment was rendered in the U. S. Circuit Court against Robert Noble of Georgetown, El Dorado county, for $5230, for cutting timber on Government lands. A few days ago Deputy U. S. Marshal Hopkins went to Georgetown and attached Noble's mill, 184 acres of land, a large lot of logs and lumber, houses, etc., to satisfy the judgment.

First Idea of Employing Steam.

The following extract from the life of George Stephenson, Railway Engineer, by Samuel Smiles, Boston, 1859, page 69, is of interest:

Solomon de Caus, who was shut up for his supposed madness in the Bicetre at Paris, seems to have been the first to conceive the idea of employing steam for moving carriages on land, as well as ships at sea. Marion de Lorme, in a letter to the Marquis de Cinq-Mars dated Paris, Feb. 1, 1641, thus describes a visit paid to this celebrated madhouse in company with the English Marquis of Worcester: "We were crossing the court, and I, more dead than alive with fright, kept close to my companion's side, when a frightful face appeared behind some immense bars and a hoarse voice exclaimed, 'I am not mad! I am not mad! I have made a discovery which would enrich the country that adopted it.' 'What has he discovered?' asked our guide. 'Oh,' answered the keeper, shrugging his shoulders, 'something trifling enough! You would never guess it. It is the use of the steam of boiling water.' I began to laugh. 'This man,' continued the keeper, 'is named Solomon de Caus; he came from Normandy four years ago to present to the King a statement of the wonderful effects that might be produced from his invention. To listen to him you would imagine that with steam you could navigate ships, move carriages—in fact, there is no end to the miracles which, he insists upon it, could be performed. The Cardinal sent the madman away without listening to him. Solomon de Caus, far from being discouraged, followed the Cardinal wherever he went with the most determined perseverance, who, tired of finding him forever in his path, and annoyed at his folly, shut him up in the Bicetre.'"

An Amiable Nuisance.

It may seem just a little bit cruel to find fault with good-natured people, and yet a recent writer in one of our popular monthlies has been hard-headed enough to call attention to some of the evil results of too much amiability.

One of the many mischievous forms of what usually passes for good nature that he particularizes is that of indorsing and guaranteeing. It is very hard and unpleasant for a kind-hearted, amiable person to refuse a neighbor or old friend who asks him to indorse a note or guarantee his good faith in a transaction, and yet the amount of evil and suffering which often results from this form of cleverness and accommodation is too frequent to need comment. Many a thrifty man has been wrecked by not being able to refuse to put his name to a note as security, and many a family has suffered in consequence. It may be impossible for the best of men to get along under our present business methods without this sort of indulgence, at times, still one cannot be too careful in looking into the solvency of those who desire this kind of accommodation. Good faith and ability to pay is not afraid of rigid scrutiny. Then indorsements are often no real kindness to those who ask them, for, securing funds they have not earned so easily, they are led into extravagance and speculation which might have been avoided had they been compelled to operate in a more moderate way.

There is one form of mischief incidental to an unwise amiability that there is hardly an excuse for thatthis writer overlooked. It is that of recommending incompetent or unreliable persons for responsible positions. We once heard a State Senator boast that he had signed about 200 applications for positions in the mint. "I sign the paper of everybody that comes to me," he said. We were told the other day that the present superintendent of the U. S. mint in San Francisco had a book nearly as big as a ledger crowded with names of applicants, every one of whom came well indorsed. The same state of things exists at the custom-house, and indeed where Uncle Sam has any soup to ladle out. Now this deluge of applicants for office is largely owing to the fact that our leading citizens who are supposed to possess some influence with public officials are too indolent or good-natured to turn away any one who applies for their signature. It is easy to see that this state of things must be very annoying to our appointing powers, for when hundreds and thousands come to them, equally well labeled, how are they to discriminate? When eminent and leading citizens from indolence or too much good nature are careless in their recommendations of persons for places of trust and profit, the unworthy or incompetent are sure to get into office and the evil may be far-reaching and not easily remedied. And yet this is going on all around every day.

Many other instances of the mistakes and deceptions practiced upon the public by good-natured and really well-meaning people might be given. But this is sufficient for the present. The impulse or desire to oblige a friend, neighbor, or poor applicant, may seem very beautiful and praiseworthy, but no impulse, however generous, if tainted with injustice, deception, or even carelessness, where the welfare of the public or private persons is imperiled, should be allowed to masquerade as a virtue.

STATISTICS OF RAILWAYS IN THE U. S.—The first annual report on the Statistics of Railways in the United States, made by Statistician H. C. Adams to the Interstate Commerce Commission for the year ending June 30, 1888, submitted in March last, with the accompanying tables, makes an octavo of 390 pages. We are indebted for a copy to the courtesy of E. A. Moseley, secretary of the I. C. C.

OVERHEAD CHECK-REINS.—About 500 veterinary surgeons in Great Britain have signed a paper condemning the overhead check-rein as painful to horses and productive of disease. It distorts the windpipe, and is liable to cause paralysis of the muscles of the face, apoplexy, coma and inflammation of the brain.

The Silver Problem.

For the first time for years the San Francisco and Carson City Mints are coining standard dollars, which gives color to the impression that the administration intends having $4,000,000 coined monthly. That the wants of the country demand the full maximum monthly coinage allowed by Act of Congress is well illustrated in the fact of there only being $2,500,000 of net silver in the Treasury at the close of business on October 11th. The call was chiefly for small silver certificates for moving the crops, farmers and business men in general apparently giving them preference. In this connection it is in place to state that the usually well-informed correspondent of the New York *Journal of Commerce*, writing from Washington, D. C., under date of Oct. 11th, says that it is reported on good authority that one condition of the acceptance of the office of Director of the Mint by E. O. Leech was that no attempt should be made by him to depreciate the price of silver, and that the advance of silver in the London market on the day of his acceptance was due to a change in the policy of the United States Mint.

It now looks as if silver bullion will gradually appreciate in value, and before three months pass reach in this market, in sympathy with higher prices abroad, $1 an ounce fine. This opinion is based first on the rapidity with which the silver certificates in this country have gone into circulation; already over $280,000,000 have been issued against the silver coin held by Treasury. Besides this, of the standard dollars coined, the amount that is in general circulation aggregate $58,370,317 on the 11th day of this month. Second, the output of silver by the mines does not keep pace with the increasing demand for the bullion for coining and manufacture. Third, the appreciation of the Russian roubles also has a decidedly favorable effect on silver. Fourth, with a general revival in the various industries in England and other European nations, it is found that the circulating metallic currency is not sufficient to meet trade requirements, and therefore the more demand for small subsidiary silver coin, or else small certificates issued against silver held by the national banks. Fifth, the Asiatic countries are heavy buyers, taking apparently more than they did at this time last year, and that taken by them never returns again as a disturbing factor in the markets of this country.

THE raw borax, which is to be refined at the new East Oakland refinery, will come from a deposit at Lone Ranch, Oregon, 25 miles north of Crescent City.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Butte.

BIG SPECIMEN.—Chico *Enterprise*, Oct. 24: Jno. Adams was in town the other day and exhibited a specimen of the riches of the Butte creek mines, which put us in mind of old days. On the Sam Dean mine, on Little Butte, near the mineral slide, there was found in the regular course of mining a nugget which weighed 21¼ ounces, valued at nearly $400. It was a solid piece with no quartz in it.

El Dorado.

GEORGIA SLIDE.—Georgetown *Gazette*, Oct. 24: The Georgia Slide miners took advantage of the rain last Monday and co-operated in floating down the ditch their winter's wood, amounting to a hundred or more cords. This is their practice every fall. They have also started up their sluice claims.

Fresno.

KINGS CREEK.—Cor. Fresno *Expositor*, Oct. 25: The mineral developments in the Kings Creek mining district are very promising. Late assays being made from the shafts are valued from 500 to 800 ounces in silver and 16 in gold. This ore was taken out of what is known as the Second Sierra—Mace mine, Little Expositor mine and the Lone Pine mine. They are showing similar ore now from the Sierra. The ore taken out of the Sierra at present is nearly pure silver. In the bottom of the shaft there is four feet of white silver ore. There is a pack-train being made up near Fresno Flats to pack in barley and pack out ore in order to have it worked. The ore has been taken out by Milton Mann, an old forty-niner and experienced miner, and others. Their statement is that it cannot be beat on the Pacific Coast or any other coast.

Inyo.

IMPROVED PROSPECTS.—Inyo *Index*, Oct. 26: In the old mine, formerly known as the Drummer Boy, but now called the Erin, good prospects have been reported for some time. Heretofore the ore carried only lead and silver, but late developments show a high percentage of gold. The mine is only a short distance east of Independence Depot, and is being worked by Tom Treglown and Ike Wilmot. A piece of ore from the new strike shows free gold and if we mistake not, is rich in tellurium.

KEELER.—Mr. J. V. Skinner has his largest ten-animal team at work between Keeler and Cerro Gordo. Heavier and larger teams were found to be necessary in order to haul the large amount of freight constantly arriving for the Union Mining Co. The company are still shipping first-class ore. Ore is now coming in from the mines worked by Frank Fitzgerald, six or seven tons having arrived at the depot and now awaiting another load to complete a shipment. Regular shipments will be in order soon.

Mono.

BODIE.—*Alta*, Oct. 26: During the past week the upraise from south drift, 900 level, was advanced 12 feet; upraise from south drift, 1000 level, was driven 13 feet; east crosscut from shaft was extended 25 feet.

MONO.—During the week the south drift, 1000 level, was advanced 38 feet; west crosscut No. 2 from same was driven 22 feet.

BULWER.—During the week raise No. 5 was extended 2 feet. East crosscut from the top of same was driven 12 feet; north drift from top of raise No. 5 was started and driven 18 feet; finished putting in partition and ladders; also put in door to force air up raise.

Nevada.

GOLD POINT MINE.—Grass Valley *Union*, Oct. 25: Work on the Gold Point mine will start up again in a few days, operations having been suspended for some time, owing to the destruction by fire of the shaft-house. For the present, hoisting will be done by a horse-power whim, but the company contemplate to soon introduce water-power, which will be obtained from the Empire pipe-line, for hoisting, pumping and milling, as it is found that it will be necessary to have a mill on the ground, instead of incurring the present cost of $4 50 per ton for hauling and milling. The ledge in the shaft of the Gold Point is showing strong, between six and seven feet in width, and of good milling quality.

THE FORTUNA QUARTZ MINE.—The visit of ex-Congressman Page at the present time is with reference to the Fortuna quartz mine, near Nevada City, and while here it is his intention to make arrangements for pumping out the mine and resuming development work. The mine has a good reputation as a "prospect," having a ledge of good size and carrying well in sulphurets. It has not been worked to any great depth, and may be said not to have had a chance to show its good points. There is good hoisting and pumping machinery on the mine, and although it has not been in use for some years, with ordinary repairs it will not take long to put everything in good working order.

THE SPANISH MINE.—*Transcript*, Oct. 23: The buildings for the mill and hoisting works at Lord & Co.'s Spanish mine on Woods' ravine are inclosed, and now the putting in of the machinery can proceed without regard to the condition of the weather. The owners are operating on a limited capital, but they have a first-class property and by a continuation of the same energy and grit they have heretofore displayed will not be long in getting it under full headway.

THE CROWN POINT.—*Tidings*, Oct. 29: The water-wheel, 8-inch pump and accessories purchased from the Bidger Mining Co. have been put in place on the Crown Point mine and are now in operation. Pumping was commenced Sunday night, and as the underground workings below the 180-foot level are not extensive, it is expected that the mine will soon be dry. Joseph Bonivert is superintending operations.

Plumas.

THE GOLDEN KEY MINE.—Greenville *Bulletin*, Oct. 23: Some time since we mentioned that Moore & Owens, owners of the above-named property, were packing ore from the mine to the Hoffner mill on Rush creek, two miles distant, to make a crushing test. They crushed 57 tons, cleaned up and have shipped the bullion to the mint. The product was 53 ounces of bullion, worth over $900. The ore crushed was taken out the full width of the large vein. The showing, therefore, is very good, and stamps the Golden Key as being a valuable property. It is about 8 miles west of Greenville. A steam-mill can be erected on a good site less than half a mile from the mine. Plenty of timber for all needed purposes is at hand, on the ground. The owners are poor men, able to work the property only in a small way. It would be much better for the community if a large company could secure control of it and operate it on a larger scale.

NEW SHAFT.—We are informed that a contract has been let to sink a shaft on the ridge between Gibsonville and La Porte, 500 feet deep. The contract price is $27,500.

Placer.

TO START.—Placer *Republican*, Oct. 24: The mill on the Kendall mine at Badger ravine will start up Nov. 1st. They take 30 inches of water. B. F. Hartley has returned from Minneapolis, and he will at once build a Huntington mill for his quartz mines at Ophir. The owners of the Horman mine at Iowa Hill have bought the Grizzly ditch of "China" Tom and intend to run their machinery with water.

San Diego.

WORKING MINES.—Julian *Sentinel*, Oct. 26: Our mining interest has marched out from among the possibilities of the future and taken its place among the fixed facts of the present. The Ready Relief is being worked to-day with good success. For 20 years the boys have been sinking away, and they haven't found bottom yet, although they are down 475 feet. The Stonewall mine is the finest property in the State, employing about 200 men. A new 20-stamp mill is being added to the 10-stamp already in operation, and when completed will be the finest work of the kind on the coast. This, with other improvements the Governor is making at the camp, will cost about $200,000. The Owens, Helvetia, Big Blue, Washington, Gold King and Queen, Cincinnati Belle, Fraction, Warlock, Richmond, Hidden Treasure, Ruby, and a number of other mines are being worked at present, and prospects are good for others to start soon. Some of the last-mentioned mines are working three shifts a day, others two, and some only one.

THE WARLOCK.—Julian *Sentinel*, Oct. 18: The Warlock mine, situated about three miles from Julian, and owned by Robert Walker and Robert Bell, is now being worked by the owners. The boys have been silently at work for some time, and but little has been said or known about the results. About two weeks ago they commenced building an arastra. The boys, though inexperienced in methods of saving the gold, manage to clean up nearly $100 per ton. It has been said by persons who ought to know that they lose a large per cent of the gold. The boys are satisfied with present returns, and with plenty of good rock in sight they ought to be.

OWENS.—In the Owens mine the water this week has increased to such proportions that it is impossible to control it with the light pumps now in use, and work is temporarily suspended.

Shasta.

ANOTHER MINING SALE.—*Democrat*, Oct. 30: Another important sale of mining property was closed last Monday. Messrs. Lawrence Garrecht, Frank Young and Frank Panter sold their Mammoth mine in Old Diggins, to Mr. F. H. Meyers, of San Francisco, for $45,000. We are informed that a good portion of the purchase price was paid down, the balance to be paid in short time installments. Two Woodland bankers are interested with Mr. Meyers in the purchase. The new company will commence extensive development work right away with the view of erecting a large milling plant on the property in the near future.

UNCLE SAM.—Shasta *Democrat*, Oct. 23: The Uncle Sam M. Co. of Squaw creek, besides adding 10 more stamps to their milling plant, making 20 in all, and which will be dropping by the 1st of November, have also put in a Burleigh drill and air-compressor engine. The Burleigh will be in operation in a few days in the lower tunnel, which, when it encounters the vein, will be about 1400 feet long. This is a mining enterprise that will give Shasta county mining interests a big reputation away from home.

OLD DIGGINGS.—Redding *Free Press*, Oct 26: Ed Minot, one of the boys in blue, who has been working on the new mill of the Walker Bros., at Old Diggings, informs us that the mill is a fine one and that it is now in working order. The ore-bin will hold 500 tons of ore, and the concentrators are doing splendid work. The owners have spared no expense in getting the mill and mine in shape for the production of wealth.

Sierra.

QUARTZ MINING PURCHASE. — Grass Valley *Union*, Oct. 25: Yesterday Stephen Long and Andrew Husom paid into bank the purchase-money for a three-fifths interest in the Lone Star quartz mine in Sierra county, which is situated about 12 miles from Downieville and east of Sierra City. They have had a bond for this interest for several months, and being satisfied from careful investigation as to the value of the property, they have now paid for it upon the condition that the title is clear and indisputable. The location of the Lone Star on the vein is between the Empire and Garibaldi mines, the former now running a ten-stamp mill and the latter a five-stamp. The ledge is well defined, about two feet in width, and shows well in free gold. The Lone Star is not developed, except as to prospecting shafts, but the new owners expect to sink a working shaft on the vein as soon as they enter into possession, and steam machinery will be put up at no distant day, as both water and fuel are right at hand and can be had at but small cost. Messrs. Long & Husom have a very favorable opinion of the location and believe they have become interested in a property that will turn out well.

THE SADDLE-BACK.—*Tribune*, Oct. 19: The Saddle-Back Gold Mining Co. crushed five tons of rock from its mine this week and it went $60 a ton, or a total cleanup of $300 was the result. We have heretofore stated in these columns what the situation is and who the owners of this mine are. It is needless to say that they are all jubilant over the handsome result of their first test of the rock through a milling process. The ore was crushed in the Kentucky mill, which is situated a short distance above town. Owing to there being no wagon-road to the mine, it was necessary to bring the rock quite a distance on pack mules, which brought the cost of getting the rock to the mill up to $15 per ton. Of course the crushing of the five tons was just to ascertain the grade of the ore. A tramway will be erected very soon from the mine to the Kentucky mill, and it will not be long before the fortunate stockholders will be realizing big results from Saddle-Back mine.

A GOOD MINE.—*Tribune*, Oct. 25: The mill at the Salinas and Mercer mine was started up Tuesday. The company have completed their dam above the mine. It backs up water a distance of a quarter of a mile and is 22 feet deep. The building of the dam has been quite an expense for the company, but it will be an everlasting help to them. They will now be able to run the mill the entire year around. The Salinas and Mercer is an excellent property, and it will not be long now before the stockholders will be getting regular dividends. There are six men employed in the mine at present. G. Black is doing the amalgamating work at the mill. A large force of men will be put to work before long.

LOST THEIR DUMP.—*Mountain Messenger* Oct. 26: The Union Consolidated Mining Co. of Happy Hollow, near Port Wine, lost their dump during the storm by its sliding down upon the Highland Mary ground. The rain softened the ground to such an extent that the bulkhead gave way. There were about 8000 carloads of gravel in the dump, estimated to contain $30,000 worth of gold. Not having water to wash the gravel, it had been stored awaiting the water that caused the disaster.

SHAFT.—It is reported that the Scotch Mining Co. near Gibsonville are about to sink a 400-foot shaft on their mining claim, as they have a fine prospect.

EXTENSION.—Bald Mt. Ex. Co. made 32 feet with their main tunnel last week. The main tunnel is in 3500 feet, and very soft dark-colored slate at the face.

Siskiyou.

RAIN AND SNOW.—Yreka *Union*, Oct. 24: Miners and others can begin to laugh now and take comfort; the rain has been a pretty copious one in the valley, and the snow has been a goodly one in the mountains. It is said Sawyer's Bar mountain has several feet of the latter. With plenty of rain and snow this winter, Siskiyou is bound to make a big showing next year.

Trinity.

NEW RIVER. — Cor. Trinity *Journal*, Oct. 26: Work is being done on the Ridgeway. The tunnel is now in 715 feet and the ledge is expected to be tapped daily; the contractors are now in the footwalls, a hard black slate and full of ore matter and mineral stains, looking very favorable for a large ledge. Water is not very strong yet and is not expected in large quantities until the ledge is reached. The fine 10-stamp mill is about completed and can be got ready to run in short order. Beyond doubt it is one of the finest pieces of work in Trinity county. Taking the Ridgeway property as a whole, it is hard to conceive a more complete arrangement or to obtain a more economical way of treating ore. All the camp is deeply interested and look for further developments with great interest. The Mountain Boomer, Excelsior and Uncle Sam are at work with paying results; the Grover Cleveland is also working a small force with good results, crushing with arastra. Mr. Sherwood starts up this week, but work generally has been slack lately, owing to the lack of water. Some three weeks ago a party started for Virgin creek, consisting of some eight of our principal miners, and the reports brought back are really inconceivable. They took up or relocated some claims known to exist there for some time, and if reports speak the truth, it is one of the most valuable discoveries in the world. It consists of a mammoth ledge of free-milling ore followed on the surface for over 2000 feet and varying in width from 220 feet down to 40 feet. As a matter of fact, all the ore prospects in free gold, but of course it is low grade, but should the ore average as anticipated, $2 per ton, there is a bonanza in it for some one, as the conveniences for working cheaply were never excelled.

KNOW-NOTHING CREEK.—Trinity *Journal*, Oct. 26: From Rudolph Junkans, in the Know-Nothing creek mines, we learn that the camp is generally prosperous and the mines get better as they are opened. The Gold Run mine, owned by Raddlefinger, Dannenbrink & Co., is looking very well. The ledge they are now working is 4 feet wide. The tunnel by which this ledge is worked is being driven ahead to tap the Gold Run ledge proper. The latter ledge will be tapped at a depth of 200 feet. Much work has been done in fitting up the mine for convenient working, putting in chutes, tracks, etc. Last week the mill was started up on $100 ore. There are over 200 tons of this ore now ahead of the mill and things are now so arranged that the mill can be run during the entire year, except, perhaps, a short time during the heaviest freezing weather. The Know-Nothing is owned by Bennett, Black, Hansen & Reiley. They are now taking ore from a 2-foot ledge, having plenty of stoping ground on first-class rock. They are running a tunnel to tap the ledge at a depth of 60 ft. which will greatly facilitate labor in the extraction of ore. The Hansen is owned by D. Hansen and Geo. Morris. The tunnel they were at work on for some time proved a success, tapping the ledge as was expected. They are down on the ledge with a shaft 50 feet. The ledge shows well, being a 22-inch vein. This bids fair to be one of the best mines in the camp. The crushing of ore will begin in about a week. The Wolverine, owned by Hagelin, Dayton & Reiley, furnishes some good ore which is being crushed in an arastra. This ledge is about 1 foot wide. The Yocumville mine is owned by Bennet, Cannon and Mitchell. The ledge has been struck in the lower tunnel and they are now making a raise to connect with the upper tunnel. The lower tunnel taps the ledge at a depth of 125 feet and the ore is very good, but none has been crushed yet. They are developing the mine preparatory to putting up a mill if the body of ore is found sufficient to justify.

Tuolumne.

KANAKA MINE.—*Union-Democrat*, Oct. 26: This mine, lately purchased by parties in New York, will soon be started into full operation. The five-stamp water-mill will be increased to 10 stamps and a Blanding crusher added to the plant.

BUCKEYE MINE.—The developments on this mine show a strong vein—some 13 feet wide—of good milling free ore, and the sulphurets are found by assay to be of unusually high grade. It is stated on good authority that arrangements have been made by the owners with parties here to put hoisting works and pump on the mine at an early date and to develop it in length and depth. The work will be pushed. The mine from all present indications has a bright future. It is situated near Summersville in this county.

NEW ALBANY.—We understand that the development on the south end of this mine is showing finely, and the parties who lately purchased it from Dr. John Walker are well satisfied with the property. The 10-stamp water-mill on mine is being put in thorough repair and will soon be at work on ore of good-paying grade.

HYDE MINE.—The machinery placed on this mine by the new owners who purchased it one month ago is in successful operation, and the water is being rapidly lowered in the main shaft, 350 feet deep, preparatory to extensive work on the different levels.

TO WASH.—Tuolumne *Independent*, Oct. 23: Preparations are being made at the New '49 Diggings for washing when water comes. The ground has been well prospected and yields from two bits a pan up. Messrs. J. B. Doyle, Hugh Adair, Dan McMillan and Charles Reed are the members of the New '49 Co.

Yuba.

SMARTSVILLE.—Cor. Marysville *Democrat*, Oct. 24: The town is about one mile from the Yuba, the old mining town of Sucker Flat being between Smartsville and the Yuba. The Blue Point Mining Co., John Dunn Supt., and the Excelsior Mining Co., John Doubt foreman, are working on the Old Bar, above the famous Blue Gravel mines, which in its day took out over 7½ millions, and it is estimated did not save 25 per cent of the gold. The rest of the gold and quicksilver, enough to pay for the working, lies in the Yuba. On the Blue Gravel claim the owners had worked from the top of the hill down 250 feet to the bed of the old river. The action of the water on the old bedrock is as plain as if 250 feet of rock and gravel had never been on top of it. We noticed the place between two large rocks where $1,000,000 was taken out in 50 days. There is a natural rift in the rocks 80 feet deep below the ancient bed, which the old company utilized in that tunnel to carry the water out to the Yuba and which would have cost, Mr. Dunn says, $1,000,000 to have built. The volcanic character of the rocks is plainly perceptible. The Blue Point is working 56 men day and night and the Excelsior 40. They are both putting on new men. Each mine is paying out as wages about $3000 per month. The cement seems to be alive with gold. The pan washings show a very large percentage of gold.

NEVADA.

Washoe District.

CON. CALIFORNIA & VIRGINIA.—Virginia *Chronicle*, Oct. 26: The usual quantity and grade of ore is being extracted from the various openings on the 1435, 1500 and 1600 levels. On the 1300 level in the south end of the mine have resumed extracting of milling ore. On the 1650 level the stopes on the 7th and 11th floors continue to yield the usual quantity of ore of fair quality. On the 1950 level the incline winze below that level is down 125 feet on the slope, and are extracting ore from the bottom on the south side of the winze. During the week 1075 tons and 1440 pounds of ore were shipped to the Morgan mill; 1540 tons to the California. The average assay value of all the ore worked at these mills during the week, according to battery samples, was $28.16. Bullion valued at $48,219.15 shipped to the Carson mint.

SIERRA NEVADA.—On the 520 level from the main east drift, 1185 feet from the shaft station, a south drift is advanced 380 feet, continuing in porphyry.

UNION CON.—On the 1465 level the north latera drift is advanced 548 feet from the south line, continuing in porphyry and clay.

MEXICAN.—On the 1465 level from the north drift from west crosscut No. 1, 50 feet in from the lateral drift face, a west crosscut is advanced 26 feet. Formation porphyry.

OPHIR.—On the 1300 level the east crosscut from the shaft station, to connect with the top of the raise above the 1465 level east drift, is extended 266 feet, continuing in porphyry showing some quartz.

GOULD & CURRY.—On the 200 level, the southwest drift is extended 58 feet. Formation soft porphyry. On the 400 level, west crosscut No. 1 is extended 424 feet. Formation hard porphyry.

BEST & BELCHER.—On the 550 level, west crosscut No. 1 is extended 41 feet. Formation clay and porphyry. On the 1000 level, the northwest drift is extended 357 feet. Formation hard porphyry with streaks of quartz.

SCORPION.—The 520 level south drift is out 283 feet and continues in porphyry.

SAVAGE.—Extracting ore of good quality from the 400 level north drift. Extracted 197 mine cars of ore since last report.

HALE & NORCROSS.—East crosscut No. 1 on the 300 level is advanced 25 feet. West crosscut No. 2 on the 700 level has connected with the Chollar workings. Preparing to extract ore from the 1200 level.

CHOLLAR.—The 750 level north drift is out 590 feet and continues in porphyry. The 850 level north drift is in low-grade quartz.

POTOSI.—The 850 level south drift continues in hard porphyry. Repairing 750 and 650 drifts for timbering.

NORTH GOULD & CURRY AND EAST BEST & BELCHER.—The northwest drift to connect with the North Gould & Curry is being rapidly advanced.

IMPERIAL.—An east drift from the winze bottom below the 300 level, to connect with the Imperial shaft, is out 110 feet. The joint Confidence-Challenge 500 level north drift is out 1090 feet from the Yellow Jacket shaft.

WARD COMBINATION SHAFT.—Repairs still in progress to the 1800 level shaft station.

ALPHA AND EXCHEQUER.—The joint shaft is down 85 feet below the 500 level. The 500 level west crosscut is out 310 feet.

OVERMAN.—The south drift from the winze bottom continues in clay and quartz.

CROWN POINT.—The 700 level south drift is out 490 feet. The 400 level west crosscut cut four feet of fair-grade ore. The raise above the 600 level is up 22 feet. The bottom of the winze below the 800 level is showing ore. The 900 level south drift is reopened 464 feet.

BELCHER.—No. 2 east crosscut on the 1200 level is in porphyry and quartz. The 1000 level east crosscut continues in porphyry. The 850 level

south drift is out 172 feet. The 200 level west crosscut is in low-grade quartz.

YELLOW JACKET.—Daily ore shipments average 50 tons, battery samples showing an average assay value of $25 per ton.

SEG. BELCHER.—The 1200 south drift from the Belcher is being advanced south.

SILVER HILL.—The 160 level northeast crosscut continues in quartz and porphyry. The 260 level northwest drift continues in porphyry.

BALTIMORE.—Stripping ore on the 338 and 225 levels.

JUSTICE.—Crushed 232 tons of ore showing an assay value of $25.99 per ton.

ALTA.—Crushed 300 tons of ore, assays showing a value of $29.75 per ton. Opening the 1040 level station to cut downward continuation of 925 level ore, showing in winze below the latter level.

NEW YORK CON.—Ore of fair grade still showing in the raise above the 800 level west cro-scut.

EAST SIERRA NEVADA.—The 520 level south drift is out 165 feet and continues in porphyry.

UTAH.—On the 600 level the southeast drift is advanced 135 feet from the shaft station. Formation, hard porphyry with some water.

OCCIDENTAL CON.—During the week extracted and milled 316 tons of ore, showing an average assay value of $20.50 per ton. Shipped to Salt Lake for sale concentrates showing a total estimated assay value of $18,500.

NORTH OCCIDENTAL.—Have connected the 350 and 300 levels by an upraise and are now stoping ore from the 300 and 400 levels.

Flowery District.

OPERATIONS SUSPENDED.—Virginia *Chronicle*, Oct. 24: The suit of injunction filed by Gov. Stevenson, owner of the Lady Bryan, restraining industrious miners from developing Flowery district locations within the boundaries of the 500 acres of mineral land claimed by the Governor as included in the patented lines of the Lady Bryan, has resulted in a complete suspension of operations in that district. The suit was not entered until Messrs. Sheppard & Lees developed a stratum of high-grade ore in the Adriatic, and probably would never have been entered had no important discovery been made.

Golconda District.

GREAT REPUBLIC.—*Silver State*, Oct. 22: E. L. Labadie, who has been looking at the Great Republic and New Star consolidated mine at Golconda, says the shaft is down over 60 feet and the ledge carries three feet of good ore at the bottom of the shaft. The company will ship a carload of ore to Salt Lake to-morrow to be reduced.

Jumbo District.

THE DUNLOP MILL STARTED.—Virginia *Chronicle*, Oct. 21: The Dunlop five-stamp mill, erected in Jumbo district near the Wild Goose location, was started crushing ore from that mine last week. The mill is operated by steam-power and pulverizes 15 tons of ore in 24 hours. The ore of that district is exclusively gold-bearing, and the mill has all the modern attachments for saving the yellow metal. There is a vast amount of ore in Jumbo, showing a value of from $15 to $20 per ton in gold that can now be profitably worked.

Pennsylvania District.

TO CONCENTRATE.—Pioche *Record*, Oct. 24: W. R. McFadden, Phil Smith and John Smith have leased from T. C. Poujade the Pennsylvania quartz-mill for eight months, and went down during the week to put the mill in repair. They will make an effort to concentrate the "black jack" ore, taken out during the last workings of the mine, and which contained so much base material as to render it unprofitable to work by the milling process.

Pioche District.

ORE-PRODUCER.—Pioche *Record*, Oct. 24: The old "iron" or "paint" mine, situated in the rear of the buildings on the north side of Meadow Valley street, and which has been located and abandoned a number of times during the past 15 years, just now bids fair to become a valuable ore-producer. It was relocated several months ago by John Sheridan and Henry Deno as the Gypsy Queen, and a shaft started at a point about opposite Cedar street. The shaft is now down some 60 feet and the indications during the past week are so good for ore that the owners are encouraged to continue their developments with vigor.

Robinson District.

LOCAL MINING SALE.—White Pine *News*, Oct. 26: A mining sale was consummated in Ely last Saturday. It was not for a large amount, but, nevertheless, it is a straw that indicates a favorable mining breeze has set in for Robinson district. A. L. Tyler (the "Red Wagon" man) purchased a one-half interest in the Los Angeles mine of Willie Watson for $1000 cash. The claim is as yet but little prospected, but is located in the center of the mineral belt and prospects well. Mr. Tyler intends to develop the claim.

Sacramento District.

OFF TO THE MINES.—*Silver State*, Oct. 23: M. S. Bonnifield and County Clerk Dunn left this morning for Sacramento district to look at the mines. According to report there are good mines in that section.

Wild Rose District.

THE WILD GOOSE.—*Silver State*, Oct. 29: The ore body in the Wild Goose mine, which belongs to the Paradise Valley Mining Co., is getting larger and richer. At latest accounts it was 27 feet wide and nearly all ore.

Wolverine District.

DECEPTIVE ORE.—Virginia *Chronicle*, Oct. 24: An assay of ore recently developed in a Wolverine district mining location, eight miles east of the mouth of Six Mile canyon, showed a value of $95 in gold and $218 in silver per ton. The vein is about nine inches in width and the character of the ore is black sulphuret, carrying a small percentage of lead. Experienced miners pronounced the material worthless until they were shown the assays. The vein has a total breadth of about three feet, with well-defined walls and an eastern dip of 60 degrees.

ARIZONA.

NEW DISCOVERY.—Mohave *Miner*, Oct. 24: Thos. Woods and J. H. Cofer are working a new discovery in the Wallapais. It is an adjoining claim to the Democrat and Antelope, and they think that they will develop the richest mine yet found in those mountains. Supt. G. M. Bowers of the Nighthawk had his recent shipment of 40 tons worked at the Arizona Sampling Works instead of shipping to California as intended, being fully satisfied that he could do as well with his ore here as anywhere else. E. F. Thompson is highly pleased with the ore body in the Empire mine at Chloride. As work is pushed, the ore vein grows wider and richer. The work of pumping the water from the lower levels of the Cupel mine will require about ten days or two weeks constant pumping, when Supt. Mackenzie will resume active operations on this valuable property. Mr. Murray and others are now working the Boggs and Hackberry mines in Big Bug district, Yavapai county, and are very well satisfied with the outlook in these mines. The Arizona Sampling Works have worked since our last report the following lots of ore: E. W. Stedman, Daggett, 2½ tons; John Hawkins, a small lot of lead ore from Cerbat; M. D. Howell, C. O. D. mine, one carload; George M. Bowers, three carloads high-grade ore from the Nighthawk; M. D. Howell, C. O. D. mine west, two cars lead ore; N. C. Amer, eight tons from the Silver King mine; John Hughes, four tons of ore.

BRITISH COLUMBIA.

GOLDEN.—Cor. New Westminster *Truth*, Oct. 20: The mining sections tributary to Golden are at present suffering a reaction from the slight boom which annually strikes the country about the season the geese return. There are quite a number of prospectors out on the new discoveries on Deception and Copper creeks, and others will return to those fields just as soon as the bondholders loosen their grasp or raise the bond on the properties. There is a small force of government employes putting the finishing strokes to the Copper creek trail, and the early spring will see the Lost Chief and other claims commence a steady shipment of ore. Lowe and Daniard returned from the South Fork of the Spilimichene country, where they are engaged in assessment work. They claim to have struck the Dark Horse vein in a spot where the vein matrix is 30 feet wide. They return in a few days to prosecute further investigations in the hunt for unearthed millions. Up the Columbia, Rosamond and Kirkpatrick have started up with a force of eight men to develop, according to contract, their Tobby creek property. These claims will also be in shape to commence a steady shipment of ore in the spring. For the present, Jubilee mountain is worked only by a few prospectors finishing their assessment work, but we are led to believe that C. F. Law resumes operations there in a few weeks. The Maggie McRae is turning out larger than ever, the owner having uncovered a large chamber of copper ore, running from 30 to 40 ounces in silver.

COLORADO.

SAN JUAN.—Silverton *Miner*, Oct. 24: The Ajax is turning out some fine gray copper, which is being sacked for shipment. Two cars of 200-ounce ore per month has been the steady product of the Lookout this season. Six men will be employed all winter. The Iowa is looking fine. The gold ore is treated at Ward & Shepard's mill, and the heavy lead ore comes to town. Two men sacked 91 sacks of ore on the Ariadne last week, and the first carload of ten tons will come down in a few days. Charley Carlstrom is taking out 400 sacks of ore per week running 65 ounces silver from the Seven Thirty. The North Star (Sultan) dump which has been tested this week in the Victoria mill is found to be profitable and there is every probability that a stamp-mill will be erected for its treatment at an early day. Tim Hart, A. H. Kellar and Henry Schwarz have taken a lease on the Pandora mill dump and are putting in lixiviation works there for treating the tailings and slimes that pass from the mill. The Victoria mill has been running all the week on the North Star second-class ore, with a view of ascertaining its concentrating qualities. The Sheridan, Union and Mendota mines are all short of miners, but a man must know his business if he remains there long. A rich strike of gray copper was made last Saturday in the North Star on Solomon in the seventh level, and shipments of a carload per day are being made in add tion to 30 tons of concentrating ore which goes through the mill. The prospects up Mineral creek are developing into good mines rapidly.

DAKOTA.

THE DEADWOOD SMELTERY.—Deadwood *Pioneer*, Oct. 24: It is stated on good authority that the syndicate represented by J. K. P. Miller, of this city, has determined to at once build an experimental plant of from 15 to 20 tons capacity, for the treatment of refractory ores by pyritic smelting. If the ores are successfully treated in a plant of this size the same syndicate stands ready to furnish whatever sum may be necessary to increase the capacity to 200 or 300 tons daily. Coincident with building the larger plant the D. C. railroad is to be extended to Bald Mountain and Ruby Basin, and spurs run from the main line to camps of all the principal mines. The fact that F. R. Carpenter, to whom credit must be given for introducing the process here, yesterday presented his resignation as Dean to the school of mines faculty at Rapid, with request that it take effect at once, is construed here, as well as there, to mean he is immediately coming to Deadwood to superintend building the plant and to conduct the operations thereof.

IDAHO.

SEAFOAM.—Ketchum *Keystone*, Oct. 25: A lot of 8 tons of ore from the Birdie R. mine at Seafoam was sampled at the Ketchum sampling works this week, yielding 335 14-100 ounces silver, 2-10 ounces gold and 29 per cent lead per ton, netting the owners of the mine $2312. This is the highest grade ore shipped in quantity from the above-named camp during the season. Other shipments of ore have been made from the Birdie R. mine prior to this, but none so rich, showing evidently that the ore in this mine is improving as the work of development progresses.

THE POORMAN MINE.—Butte *Inter-Mountain*, Oct. 23: Patrick Clark, superintendent of the Poorman mine in the Cœur d'Alenes, is in the city, and this morning informed a reporter that everything is lovely at the Poorman, and the mine and concentrator are in active operation. A shut-down was rendered necessary last month, owing to a smelter combination. The shut-down was of short duration, however, and everything is now running at full blast. All the other companies are also in full operation. Mr. Clark is much disappointed, of course, at Windom's lead decision, and says the effect of it can already be noticed in the falling of lead to $3.80. Previous to the decision and in the face of an expected favorable ruling, lead sold at $4@4.05. Mr. Clark says that the disappointment of Cœur d'Alene lead miners is very great, as they had expected a favorable decision.

LOWER CALIFORNIA.

SULPHURETS OF IRON.—Alamo *Nugget*, Oct. 26: The International Co.'s mill shut down Saturday on account of their having gotten into sulphurets of iron ore on the Princesa and Telemaco mines which cannot profitably be worked in a Huntington or stamp-mill. It is thought that enough of the free-milling ore from the Ulises and the other mines will soon keep the mill running again. Just what process will be adopted for the reduction of the Princesa and Telemaco ore it is impossible now to predict, as there are several processes, either of which may be used. It is likely that a good quantity of the ore will be thoroughly tested in order to ascertain which of the different methods will produce the best results. It may be necessary in order to make these tests to take the ore to some of the big reduction works in the States. One thing is certain—an ordinary quartz-mill cannot work the ore to advantage and save the gold even with concentrators. The ore is very rich and lies in large veins, in the Telemaco being five feet wide.

ANOTHER BIG GOLD BRICK.—Before the International Co.'s quartz mill shut down last Saturday Mr. Ayers cleaned up 40 pounds (troy) of amalgam, which was retorted Monday and left a gold brick worth $3500. Altogether the company's mill has run 24½ days and has turned out $12,500 in gold.

THERE have been many prospectors here and good ones, too, who have not struck it rich—in fact have not struck it at all, and many a tenderfoot has left the country a sadder if not a wiser man. This occurs in all mining countries, but the yield of bullion now commencing to set in will after a while begin to convince the outside world that somebody is making a living down here in these frosty mountains.

NEW MEXICO.

SAN PEDRO.—Silver City *Enterprise*, Oct. 25: San Pedro is resting on her laurels just now. Quiet reigns supreme, and all are looking longingly forward to renewed activity in the mines. The closing down of the Santa Fe copper mine and smelters has had the effect of throwing a damper upon the "boomers." Much necessary improvement is being made in and about the mine and smelters, and as a consequence, considerable time must elapse before work will be resumed. A large amount of additional machinery is arriving, all of which has to be set up before anything can be reasonably expected. The mines are doing well, and a large amount of development work is being done in a quiet way. Lincoln-Lucky, as a matter of course, is eagerly watched, as it is presumed to be in the lead. Black Hawk is plugging along slowly, and is more eagerly inquired after, if possible, than is the Lucky. The reason for the interest shown in this property is evident, as a big strike here would settle the camp for all time to come. Situated as it is, at the north end of the camp, nearly 2 miles distant from the Lucky, should a body of ore be encountered here, it would conclusively prove the continuity of ore, through all the intervening space. It is a theory borne out by experience in camps of similar formation to this one, that galena and carbonate ores are apt to be found at points largely removed by distance, and it has also been demonstrated satisfactorily that the ore bodies prove continuous, or nearly so. There are a few notable exceptions, but the rule applies generally.

AROUND CHLORIDE.—*Black Range*, Oct. 25: L. J. Otto is making a survey of the Goodenough mine and the claim adjoining on the west, the Extension, which is the property of the lucky owners of the Goodenough. Dr. E. P. Blinn is working his newly discovered prospect which he has named Mrle. The Mrle, though an infant prospect, produces some fine-looking ore. The Ana Bell, on the upper waters of Mineral creek, in this district, has a body of milling ore 17 feet in width and gives assay returns from 10 ounces in silver to 50 ounces in silver; the ore also carries gold. This property is developed by a shaft and a tunnel; the tunnel is being steadily pushed forward and has now attained the length of 250 feet, and it is expected that 30 feet more development work will tap a chute of high-grade ore. The Ana Bell is owned by Messrs. Payne, Cloudman & Chandler of Fairview. Owing to the reorganization of the Midnight Mining Co. the Midnight mine shut down temporarily last week. The Midnight mine can show more solid stoping ore for the amount of development than any other mine in Sierra county, and the beauty of the whole business is that the ore contains excellent milling properties. The mine has for a long time been carefully and judiciously developed under the management of Superintendent Cass, and is now in excellent condition to be worked on a large scale and at good advantage.

MONTANA.

TWIN MOUNTAIN.—*Inter-Mountain*, Oct. 22: With the completion of the road now being built into Twin Mountain district the mines of that locality will soon be better known, and as knowledge of them spreads, interest in them will increase, and unless present indications are entirely false, a new and profitable field for investors will be opened and the reports of large deals from there will be frequent. One reason why so comparatively little is known about the district has been its hitherto almost inaccessible location; being away from all roads, no one but the hardy prospector has cared to visit it. Although badly handicapped by reason of their isolated position and consequent difficulty of obtaining supplies, the prospectors have continued to develop their claims and now have some good results to show for their faith and labors. One of the principal mines is the Richmond, owned by the American Gulch company of Anaconda. A shaft 150 feet deep has been sunk and tapped the ore body at a depth of 25 feet from the surface. From this point a continuous vein of ore has been followed and the present bottom of the shaft is in a body of iron and lead carbonate ore 15 feet wide. The Grasshopper, owned by Abel Fitz, has a shaft 27 feet deep and a tunnel of 80 feet. An 8-foot body of iron carbonate ore has been uncovered in both the shaft and tunnel which assays 250 ounces in silver and 71 per cent lead. The Edwards Carbonate, one of the first locations made in the district, is owned by Edwards & Co. Development consists of a shaft 95 feet in depth and a tunnel of 300 feet which follows an ore body of about 2½ feet. Several heavy shipments have been made during the present year and more will follow, as the mine is in condition to allow of its being worked during the entire winter. Limebach, McIntyre & McDonald own the Cassey Howard. A well-timbered shaft 60 feet deep has been sunk upon this claim. Crosscutting for the main ledge is now being carried on from the bottom of the shaft. Considerable galena ore has been taken out. Another very promising prospect is the Levi P. Morton, of which Walter R. Fish & Co. are the proprietors. From the bottom of the shaft, 28 feet deep, a level has been run a distance of 50 feet showing ore the entire length. Between 10 and 15 tons of fine lead carbonate ore are piled on the dump. Assays from this ore run from 75 to 250 ounces in silver. A mine owned by Wolf, Bair and others of Butte also shows up well, and work upon it will be carried on all winter. The Lynn, owned by Guler and Driscol, has been opened by a 25-foot shaft and several tunnels. Quite an amount of good ore is piled on the dump. Of course there are numerous other prospects in the camp, and some of them make exceedingly good showings for the amount of development done upon them. Those mentioned above are among the best known and so far most valuable claims in the district.

THE CHAMPION.—*New Northwest*, Oct. 25: The Champion Co., last Monday night, temporarily cut down their mining force materially in the mine. The reason for this is obvious. They are erecting a 20-stamp mill which will be completed on or before Jan. 1st, to mill their ores instead of shipping them. They have now on the dump ore that it is estimated will net the company $100,000, and ore enough exposed in the mine to run the mill a year. The ores are not high enough grade to justify shipping, when by holding them a short time they can be reduced at a much greater net profit in their own mill. With the amount on the dump it is not considered necessary or desirable to continue raising large quantities now at heavy expense until the mill is in operation. Hence the force is reduced, and those retained are working on the upraise from the 350 foot level leading toward a heavy body of ore. Work is progressing satisfactorily on the mill building and it will be ready for the machinery, a part of which is already in transit.

UTAH.

LEAD MINES SHUT DOWN.—Salt Lake *Tribune*, Oct. 24: The blow struck at our lead-mining industry by the Secretary of the Treasury takes sudden and severe effect. It crushes immediately operations of the two distinctively largest lead companies in Utah, and they will be obliged to shut down. The Lead Mining Co. of Bingham and the Brooklyn employ directly and indirectly over 300 men. Their product should yield a revenue of some $10,000 monthly; but the immediate effect of Secretary Windom's ruling is to not only destroy that revenue, but to make an actual deficit in the operations of these companies. Six hundred tons of ore, produced at a cost of $16 per ton, have to be sold for $15.75. The company cannot stand that sort of a balance-sheet, and on the 1st of the coming month will be obliged to shut down and discharge all employes except three or four watchmen. It is a severe blow to the industry of the Territory, and will be especially hard on Bingham. It will also have consequences more far-reaching than the mere cessation of industry in two great producers, for the lack of the ore hitherto put on the market by these companies will seriously cripple and reduce the smelting activity of this valley. It is probable that this great and disastrous shut-down will be followed by others that in the aggregate will stagnate Utah's mining industry in general, leaving running only such exceptional concerns as the Ontario, Daly and others whose lead product is not their life. Hitherto the companies now shutting down have sold no ore except on a four-cent basis, the smelters at Denver, Omaha and Pueblo taking it at that rate for its excellent fluxing qualities and in the hope that the Treasury Department would do our home lead-producers justice; but now that rate is no longer available. The highest Treasury official says our miners must compete with 60 cents a day Mexican peon labor and the price of lead ores come down accordingly. The result is a compulsory shut-down, as recited above. In regard to the capital invested, of which so much bandle is made, the companies named have a plant which stands them at about $400,000, and this is but the investment of two allied companies. The companies which are now shutting down have spent large sums in improvements and for machinery the present season, expecting the favorable decision they had a right to. A cessation of work means practically an abandonment of their property.

WASHINGTON TERRITORY.

THE IRON AGE.—Ellensburg *Capital*, Oct. 24: The continued advance in iron in the East and South is causing manufacturers to turn their attention toward the iron mines of the West within the past month, and Kittitas county, which contains the most extensive and varied deposits of iron of any section in the Northwest, is now being carefully examined by iron experts and capitalists. Mines hitherto neglected are being relocated, developed and bonded at good prices. The iron fever is spreading in a degree that is certainly gratifying to the people of Ellensburg, who see in it great possibilities for their city. It would be impossible to find a city more favorably situated for the establishment of large iron furnaces and rolling-mills than Ellensburg, located as it is in the center of iron and coal deposits, the extent of which it would be impossible to tell. Ellensburg ranks first among the cities of Washington in a commercial point at present, and with its iron manufactories once established, it will rank first among the manufacturing cities of the Pacific Coast.

MECHANICAL PROGRESS.

Hardening and Tempering Steel.

The Value of Science in Metallurgy.

It must be very evident to every close observer of recent improvements in the metallurgical processes connected with the production and manufacture of steel and iron that those processes are receiving much more careful and scientific attention than was the case formerly. Still, with all the care and scientific research thus far expended, it is very evident to close observers that there is much yet to learn in regard to the metallurgy of iron and its compounds. There are good reasons for believing that iron itself can exist in more than one state—that it is allotropic in character. This is really an enforcement of the molecular motion theory in regard to iron, which is just now largely influencing the character of metallurgical experiments.

Iron and Steel Masters

On both sides of the Atlantic have been very much interested within the past few weeks in the proceedings of the late meeting of the British Association, especially in an address delivered before that association by Prof. Roberts Austen on the "Hardening and Tempering of Iron." The professor commenced with a brief history of the progress of knowledge in hardening and tempering steel. He remarked that notwithstanding the great progress in and importance of that art, the true theory of the process is still far from clear, and such knowledge as we possess has been very slowly gathered. His remarks under this head were very interesting and instructive, but we must reserve them for a future occasion, and call attention now to only the later experiments and progress in this direction. The professor proceeded to consider

The Mode of Existence of Carbon in Steel

He showed at great length that although carbon in any of its forms, graphite, soot, or diamond, could enter into intimate association with iron, the relations of carbon and iron were really very complex. The researches of Karsten, Berthier, and finally, of Sir F. Abel, had shown that in soft steel the carbon exists in the form of a true compound or "carbide" with iron, while in steel which has been hardened by rapid cooling, the carbon is "dissolved" and not truly combined. In "tempering" or softening steel another change in the relations of the carbon and iron is effected, the degree of hardness of the steel depending mainly on the relation subsisting between the carbon and the iron, although the state of the carbon did not explain all the facts of hardening and tempering.

The Allotropism of Iron.

The next portion of the subject was one of great difficulty. Prof. Austen gave full reasons for his belief in the allotropism of iron—that it can exist in more than one state. For instance, carbon may be equally pure carbon either in the diamond or sooty form; sulphur equally pure sulphur, either in a form which is soft and pliable at ordinary temperatures, or in the hard yellow form with which we are all familiar; the soft passing instantaneously into the hard variety with evolution of heat. In the same way there is strong reason to believe that at a red heat the molecules of iron are really hard.

The Effect of Heat on Iron.

If pure iron be cooled, either quickly or slowly, it passes into the soft modification; but if carbon be present and the metal be quickly cooled, it has no time to pass into the soft modification; the presence of the carbon hinders its passage, and hard steel is the result. Bearing in mind that evolution or absorption of heat is the surest indication of molecular change in the element, Prof. Austen gave experimental evidence of the existence of

Molecular Change in Iron.

One experiment was very curious. A red-hot bar was taken from the furnace, gripped only at one end, while a weight was attached to the other. The bar did not bend when in its hottest state; it might have been expected to be soft, but it fell six inches as soon as the point of molecular weakness came, the iron being comparatively cold.

The Condition of Iron Easily Affected.

The professor proceeded to show how important the action of small quantities of matter on masses of iron or steel really is, pointing out that this appeared to be a broad principle of nature, one recognized by the alchemists, and still employed by the metallurgists, who marvel daily at the extraordinary effect which would be produced on iron by quite small doses of sulphur, phosphorus, chromium, or aluminum. Prof. Austen said that he was not afraid of the taunt of Francis Bacon that "sottishly do the chymics appropriate the fancies of poets in the transformation of bodies to the experiments of their furnaces," for, although metals could not be transmuted, they could be transformed by very slight influences, so as to behave, from the point of view of special work demanded from them, either beneficially or prejudicially.

The Best Qualities of Steel.

Prof. Austen pointed out the importance of hardening and tempering in relation to all kinds of steel. In the early days, when steel was substituted for iron, it was viewed with suspicion, mainly because the fact that iron could exist in two distinct molecular states was ignored. He showed that the material of which the Forth bridge is made owes its substantiality to the fact that, while being very strong, it is very soft and ductile and will not harden energetically. The enormous importance of the

Substitution of Steel for Iron

Was shown by the figures supplied by Mr. Webb of Crewe, who stated that on the entire system of the London & Northwestern railway 18 tons of steel disappeared daily by oxidation and wear. The importance of oil-hardening in relation to gun steel was shown by the fact that at the St. Chamond Works, on the Loire, they had a tank containing 44,000 gallons of oil, into which the hot gun steel was plunged. With regard to highly carbonized steels, it was shown that a properly tempered die would strike 40,000 coins, while one that had been overhardened would probably fracture with the first coin it attempted to strike.

In Concluding His Address,

Prof. Austen said it was strange that so few researches had been devoted to the relations of carbon and iron, and so many to organic chemistry. This arose, he thought, from the belief of chemists and physicists that operations which involved the use of high temperatures were necessarily inaccurate. It could not be that chemists feared, to quote Macaulay, that "science would be degraded by being applied to any purpose of vulgar utility," for he trusted that he had shown that "the empire over matter," which is the object of all research, could be as surely gained in the field of metallurgy as in any other.

Rolling Fluid Metal Nothing New.

The wise King of the Jews was not far wrong when he said "there is nothing new under the sun." Reference is made to this remark by the fact that the London (Eng) *Ironmonger* of August 24th claims that the Norton-Hodgson (American) process of rolling melted metals into sheets, etc., noticed in these columns a few weeks ago, was covered by one of Sir Henry Bessemer's specifications of 1846 and 1857. The latter is as follows: "My invention consists in manufacturing sheets, plates, bars and other forms direct from fluid malleable iron or steel, in place of allowing the same first to cool, or set in molds."

It appears that the patent also included the rolling of rough plate-glass in a fluid condition between a pair of horizontal rolls, which were cooled by water passing through them; also an apparatus for making tin-foil in large sheets by allowing the fluid tin to flow in between a pair of rolls, kept cold by being made hollow and having cold water passing through them. And it is specially stated, "It will be obvious that by the same means as here described, thin sheets of other metals, or alloys of metals, as well as tin-foil, may be equally well manufactured."

Then followed the description of the rolling-mill, with its hollow rolls and water circulation, with external jets playing against the rolls, and the other accessories described in the American invention.

Subsequent History of Bessemer's Process.

It appears that this process was one of the inventions which Mr. Bessemer included in his licenses for working the Bessemer steel patent. Having thus ceded his personal interest in the process, he had no cause to undertake its working, and manufacturers generally seem never to have considered its possible profit worthy the difficulties of development. In the new American invention there may be, for all one can tell from the descriptions which have yet reached England, important differences from the process invented by Bessemer. But the fact remains that for years the principle has been available to our tin-plate makers and other metal-rollers for gratuitous utilization. Of course the patents controlling it have now expired. It does not, perhaps, say much for English metallurgical enterprise that it has been left to America to suggest the practical employment of the process.

Mr. Bessemer made various experiments at the time with his patent machine, and rolled some tin-plate which was pronounced by competent judges to be of splendid quality and finish.

The *Ironmonger* says: "A small piece of this very plate is shown in the large case of specimens of early Bessemer products which was presented some years ago by Sir Henry Bessemer to the Iron and Steel Institute, and is now in the possession of that body. The practicability of the invention was absolutely proven, but it was not pushed forward for the sole and simple reason that nobody had any direct interest in working it."

LOOKING INSIDE BOILERS WHILE UNDER STEAM. — A German scientist, Herr Blass, claims to have devised an incandescent lamp arrangement by which the interior of a boiler may be inspected while the same is under steam. A thick, black tube is inserted through a stuffing-box, through which a small incandescent lamp is introduced, which is connected with a battery. By means of a thick glass-plate, located in the shell of a boiler at a convenient place, the illuminated interior of the boiler may be inspected. While this appears at first sight but a scientific experiment, brought into practical shape it might prove a valuable aid in investigating the conditions prevailing in a boiler at work, and thereby be the means of providing remedies for many of the existing uncertainties in boiler manipulation.

SCIENTIFIC PROGRESS.

The Wonders of Science.

So many queer and unexpected things have been accomplished by science, in recent years, and especially by means of the telephone and its allied appliances, that the public mind is prepared for almost anything. True, we have not yet seen people getting their dinner out of the end of a wire, or men flying around in the air by aid of machines formed with aluminum and operated by electricity; neither have we seen sleep done away with as a waste of time, or the elixir of life fully successful in doubling or trebling the past extreme age of life. These dreams have not as yet been realized; but it is unsafe, in view of what has already been done, to pronounce them absolute impossibilities. But, in very truth, there seems to be scarcely any limit to the power and expansibility of electricity in connection with conducting wires.

For We Can See Sound

Looking down into the throat of a phonograph; we can see a laugh, a cry, a whistle, a strain of music, the ring of a bell, the bark of a dog, thunder, and the whistle of a locomotive. There it is all recorded on a sheet of wax in a series of little dents or holes made by the point of a needle, and without the use of a powerful magnifying-glass you cannot distinguish any difference between these sounds as recorded by the phonograph. Nobody, not even a scientist, would have thought such a machine possible 15 years ago, and that is why it was discovered by accident and not as the result of a long series of logical scientific deductions, and after it was discovered and perfected science has stepped in and furnished the explanation of its phenomena. Next we have a device for

Magnifying Sound.

It is called a "megaphone," or sound magnifier. This is one of Edison's latest efforts, and is regarded as one of his most wonderful exhibits at Paris, where it seemed to attract more attention from the Frenchmen than did any other of his numerous exhibits, not excepting the graphophone, which is so well known on this side. Going into the American exhibit with a friend, says the New York *World*, you would send him to a point a half mile away and ask him to whisper certain words into the megaphone. As soon, it seemed, as the syllables had left his lips, they came bounding over the wires to your ear so greatly magnified that what he spoke as a whisper reached you as a mighty roar, powerful, resonant, yet as distinct as if shouted at your side. The popular American topical songs, as rendered through the graphophone, attracted continuous and enthusiastic crowds. Then we have a

Far-Sight Device,

Which is quite certain to become a practical reality, and by which we will be able to see and recognize our friends even though many miles away. In addition to what Mr. Edison is doing with this device, several European savants have also taken up the development of this wonderful idea. Herr Korzel, a well-known German savant, recently showed its feasibility by exhibiting to a party of scientists in Berlin the image of a friend depicted on a glass plate, who was at that moment speaking to him through a telephone at Potsdam, many miles away. Just before Mr. Edison left London on his return home, he wrote to Mr. McLaughlin, who is Vice-President of the Pacific Phonograph Co., that he had some new phonographic ideas which he thought would be useful and which he would proceed to work out as soon as possible after his return to New York.

Electro-Magnetic Disturbances.

It is well known that electro-magnetic disturbances on this coast have occurred simultaneously with certain sun disturbances observed through the telescope. Evidently the electro-magnetic force must have traveled from the sun to the earth with the velocity of light. Twenty years ago Clerk Maxwell asserted that light was an electro-magnetic wave movement. Following out his suggestion, an interesting series of experiments has recently been made by Prof. Hertz of Brown University, at Providence, Rhode Island, which show that electro-dynamic force is, like light, a wave motion, propagated through ether, and, like light, subject to reflection, refraction, and concentration by means of lenses. Prof. Hertz's experiments were based on the variations of an induction current at various distances from a metal wall, reflecting the primary current; based, in fact, on the well-known phenomena of wave interference, and they show the length of an electro-dynamic ether wave to be 1.72 m., its velocity through space to be 300,000 m. per second, or identical with that of light. By means of a metal reflector, electro-dynamic waves were focused, some substances, such as wood, being transparent; others, such as metal, being opaque, and casting electro-dynamic shadows. A huge prism of tar, weighing 1200 pounds, showed that the laws of refraction are analogous to those of light. Almost infinitesimally short vibrations of ether manifest themselves to us as chemical action, longer ones as light, still longer waves as heat, and these very long waves as electro-dynamic force. Electro-dynamic force is the low and fundamental base of which light and heat and chemical action are the high treble.

Gravitation and Other Mysterious Forces

May yet be shown to be wave lengths in the middle register, and practical applications will undoubtedly be made of this new control over electro-dynamic forces possibly as important as those of the telescope, microscope and spectroscope over light.

Only in the Vestibule of Knowledge

It may be truly said that we are as yet only in the very vestibule of knowledge, and great as have been the unfolding of nature's treasures, what has thus far been done must only be regarded as but the beginning of what may be revealed to future generations. In the search for knowledge it may truly be said: "Veil after veil will lift; but there must be veil upon veil behind."

WHY MORTAR HARDENS.—Mr. G. R. Burnell says that until very recently it was held by most engineers and architects, by himself among others, that the solidification of mortars took place in consequence of the absorption of carbonic acid gas by the lime during the process of crystallization; but it has been fairly objected to this theory that the quantity of carbonic acid gas contained in the atmosphere, which could be brought into contact with a large body of cement, would not suffice to saturate the latter. The generally received opinion on the subject now is, that limes harden simply in consequence of the combination with water which takes place during the slackening; and that the rapidity of the setting, and the permanence of the newly-formed hydrate of lime, depends upon its being combined with some other salt; the pure hydrate of lime, in fact, is soluble, the hydrated silicate of lime is tolerably insoluble, but it forms slowly; while the hydrated double silicate of lime and alumina, or of lime and magnesia, are practically insoluble. The facts actually observed seem to confirm these views, and they certainly enable us to account for not only the different modes of setting, observable in different limes, but also for some of the more gradual actions which take place in that material, and the effects reciprocally produced by the mixtures of various ingredients. In the case of the now generally used Portland cements, and in that of under-burnt lime, some very curious phenomena may, however, be observed, which appear to indicate that the simple laws mentioned above do not comprehend all the conditions which may arise; so that the above theory itself must only be considered as a step toward the attainment of a complete one of a more general character. The phenomena, to which he thus alludes, are connected with the obscure subject of the chemical actions which take place under the influence of high degrees of temperature.

WHAT BRANCHES EMPLOY ELECTRIC WELDING.—At present electric-welding machines in different parts of the country are being used in the following capacities: Axle welding, carriage gears, fifth wheels, twisted-wire cables, welding safe ends of boilers, wagon tires, hoops for barrels. It is also used for joining wires of copper, iron, steel and German silver together in like metals and different combinations. Bars of metals may be joined at angles, as T or Y joints; welding eye rings to the end of bars making rings of precious metals, uniting steel with iron in the manufacture of agricultural implements, tools, etc.; lengthening or shortening rods, bars, screws or bolts; welding of cast-iron pieces in the general construction of machinery, such as frames, fittings, etc. Electric machines are also used in welding boiler plates and other sheet metal and thereby replaces the ordinary method of riveting. The machines are suitable for clamping devices, for electric soldering, brazing, forging or bending of metals. The electricians in the establishment of the Thompson Electric Welding Co. at Boston are now experimenting on radiator and general brazing, on riveting machines which it is claimed will cause a complete revolution in the old methods of riveting, as by electricity the riveting can be done so as to avoid all leaking. One of the latest and most satisfactory developments has been that of welding chain. The company claim that a great merit to the electrically welded chain links is that when subjected to a fracturing load the limb will break away from the weld, whereas when welded by ordinary processes it almost invariably breaks at the weld.

A NEW FLAMELESS EXPLOSIVE.—Miners have long been on the lookout for an explosive which, while doing the work of gunpowder, will be free from the danger which attends that explosive in mines when explosive gases are liable to be met with. It is now claimed that such an agent has been discovered. The *British Mail*, of September last, says that a flameless explosive, called carbonite, which has for some years been largely used in German coal-mines, will shortly be introduced into England. A powerful syndicate, comprising some of the engineers of the best coal properties in the United Kingdom, has been formed for this purpose. It is stated that this explosive has been proved to be absolutely safe in "fiery mines," and in cases where it has been exploded in the midst of an explosive mixture of fire-damp and air it has failed to ignite the mixture. The regulations against the importation of these explosives are so rigid that it is difficult to get any new explosive brought into the country. We are informed that, through the kind offices of Mr. Stuart Wortley, M.P., a special permit will be given for a parcel of the explosive for experimental purposes, and that the first experiments will be carried on at important collieries in the neighborhood of Sheffield.

GOOD HEALTH.

The Secret of Long Life.

We give below, from *Macmillan's Magazine*, some sound counsel for men in the middle of life, and for those as well who are far advanced on the down grade:

Bacon says: "Discern of the coming on of years, and think not to do the same thing still, for age will not be defied." Half the secret of life, we are persuaded, is to know when we are grown old, and it is the half most hardly learned. It is more hardly learned, moreover, in the matter of exercise than in the matter of diet. There is no advice so commonly given to the ailing man of middle age as the advice to take more exercise, and there is perhaps none which leads him into so many pitfalls. This is particularly the case with the brain-workers. The man who labors his brain must spare his body. He cannot burn the candle at both ends, and the attempt to do so will almost inevitably result in his lighting it in the middle to boot; the waste of tissue will be so great that he will be tempted to repair it by the use of a too generous diet.

Most men who use their brains much soon learn for themselves that the sense of physical exaltation, the glow of exuberant health which comes from a body strung to its full powers by continuous and severe exercise, is not favorable to study. The exercise such men need is the exercise that rests, not that which tires. They need to wash their brains with the fresh air of heaven, to bring into gentle play the muscles that have been lying idle while the head worked. Nor is it only to this class of laboring humanity that the advice to take exercise needs reservations.

The time of violent delights soon passes, and the effort to protract it beyond its natural span is as dangerous as it is ridiculous. Some men, through nature or the accident of fortune, will of course be able to keep touch of it longer than others, but when once the touch has been lost the struggle to regain it can add but sorrow to the labor. Of this our doctor makes a cardinal point, but pertinent as his warning may be to the old, for whom indeed he has primarily compounded his elixir vitæ, it is yet more pertinent to men of middle age, and probably it is more necessary. It is in the latter period that most of the mischief is done. The old are commonly resigned to their lot, but few men will consent without a struggle to own that they are no longer young.

Light in the Sick-Room.

Dr. B. W. Richardson, in the course of a lecture on "Disease, and How to Combat It," makes the following remarks:

A custom prevails, despite all our sanitary teachings, that the occupant of the sick-room in the private house should be kept at all hours in a darkened room. Not one time in ten do we enter a sick-room in the day-time to find it blessed with the light of the sun. Almost invariably, before we can get a look at the face of the patient, we are obliged to request that the blinds may be drawn up, in order that the rays of a much greater healer than the most able physician can ever hope to be may be admitted. Too often the compliance with this request reveals a condition of room which, in a state of darkness, is almost inevitably one of disorder everywhere; foods, medicines, furniture, bedding misplaced; dust and stray leavings in all directions.

In brief, there is nothing so bad as a dark sick-room; it is as if the attendants were anticipating the death of the patient; and, if the reason for it be asked, the answer is as inconsistent as the act. The reason usually offered is that the patient cannot bear the light; as though the light could not be cut off from the patient by a curtain or screen, and as though to darken one part of the room it were necessary to darken the whole of it. The real reason is an old superstitious practice, which once prevailed so intensely that the sick, suffering from the most terrible diseases, smallpox, for instance, were shut up in darkness, their beds surrounded with red curtains, during the whole of their illness. The red curtains are now pretty nearly given up, but the darkness is still accredited with some mysterious curative virtue.

A more injurious practice really could not be maintained than that of darkness in the sick-room. It is not only that dirt and disorder are results of darkness; a great remedy is lost. Sunlight is the remedy lost, and the loss is momentous. Sunlight diffused through a room warms and clarifies the air. It has a direct influence on the minute organic poisons, a distinctive influence which is most precious, and it has a cheerful effect upon the mind. The sick should never be gloomy, and in the presence of the light the shadows of gloom fly away. Happily, the hospital ward, notwithstanding its many defects—and it has many—is so far favored that it is blessed with the light of the sun whenever the sun shines. In private practice the same remedy ought to be extended to the patients of the household, and the first words of the physician or surgeon on entering the dark sick-room should be the dying words of Goethe: "More light, more light!"

PENSION DISEASES.—There is a delightful contrast between the rugged and healthy state of the veteran after his pension has been allowed and his decrepit condition before the allowance. I know a man who was simply a harbor of refuge for diseases until he obtained his pension, and then they disappeared. Having drawn his "arrears," he prudently took out a life-insurance policy. The affidavit upon which he obtained his insurance policy curiously contradicted the affidavit on which he got his pension, proving that the pension had restored him to health and made him a "good risk" for the insurance company. The Department was greatly shocked on learning the facts and revoked the pension, but on discovering that the delinquent was a good caucus warrior and hustler at the polls, the Department became shocked at its own imprudence and restored him to the "nation's roll of honor." It is not irony or sarcasm to say that the insurance companies can afford to give lower rates to old pensioners than to other people, because the pensioners' chances of long life are greater than the chances of other men.—*Gen. M. M. Trumbull in the Popular Science Monthly.*

FOR COLD IN THE HEAD.—There are a number of ways of aborting a cold in the head, but most of them are by the means of quite powerful drugs, which a person unfamiliar with their use is never justified in taking on his own responsibility. The Swiss method of treatment is one of the simplest and most efficacious. It is applied in this way: Half fill a jug with boiling water, and into that put a teaspoonful of well-powdered camphor. Fashion out of writing-paper a funnel with which cap the top of the jug. The camphorated steam should be inhaled through the nose for 10 or 15 minutes, the inhalation being repeated, if required, every four or five hours. If, in spite of its unpleasantness, the inhalation is persisted in, it is said that three repetitions will always effect a cure, however severe the "cold in the head" may be.

INTERESTING SURGICAL OPERATION. — The Manchester *Guardian* mentions a wonderful new departure by a provincial surgeon. A small tumor was removed from an important nerve in a patient's arm, and in the course of the operation some of the nerve itself was taken away. This was naturally followed by loss of sensation in the part of the skin to which the nerve was distributed. After 48 hours, the surgeon, having obtained a piece of healthy nerve from a leg which had just been amputated, proceeded to restore the continuity of his patient's nerve with the borrowed piece of tissue. The result was that sensation returned in 36 hours, and there was every prospect of a complete recovery.

USEFUL INFORMATION.

What Invention Has Done.

In making bread-boxes, three workers can do the work of 13 box-makers by old methods.

In cutting out clothing and cloth caps with dies, one worker does the work of three by old methods.

In leather manufacture, modern methods have reduced the necessary number of workers from 5 to 50 per cent.

A carpet-measuring and brushing machine with one operator will do the work of 15 men by the old methods.

In the manufacture of flour, modern improvements save 75 per cent of the manual labor that once was necessary.

In making tin cans, one man and a boy, with modern appliances, can do the work of 10 workers by the old process.

By the use of coal-mining machines, 160 miners in a month can mine as much coal in the same time as 500 miners by the old methods.

One boy, by machinery, in turning woodwork and materials for musical instruments, performs the work of 25 men by the old methods.

In the manufacture of boots and shoes, the work of 500 operatives is now done by 100, a displacement of wage-earners of 80 per cent by aid of machinery.

In stave-dressing, 12 co-laborers, with a machine, can dress 12,000 staves in the same time that the same number of workers by hand could dress 2500 staves.

In the cotton-mills in the United States, the manual labor has been reduced about 50 per cent. Now one weaver manages from 2 to 10 looms, where one loom was formerly tended by one worker.

In the manufacture of brick, improved devices save one-tenth of the labor, and in the manufacturing of fire-brick, 40 per cent of the manual labor is displaced.

In the manufacture of carriages, it used to take one man 35 days to make a carriage. It is now made by the aid of machinery with the work of one man in 12 days.

In the manufacture of agricultural implements, 600 operatives, with machinery, including 18 classes of wage-earners, do the work of 2145 wage-earners without machinery, displacing 1545 workers.

In the manufacture of wall paper, one worker, by the aid of machinery, does the work of 100 workers by manual labor, and in cutting and drying paper by machinery, four men and six girls do the work of 100 operators by old methods.

In manufacturing gun stocks, one man by manual labor was able to turn and fit one gun stock in one day of ten hours, while three men now by a division of labor, and the use of machinery, can turn and fit 125 to 150 gun stocks in ten hours. This displaces the work of 44 to 49 wage-workers.—*Ex.*

REMOVING OLD PAINT.—The ordinary process of scraping old paint, or burning it off, is hardly expeditious enough for general purposes, and is also laborious. Soda and quicklime are far more thorough, and the paint is more quickly removed. The solution of half soda and half quicklime is thus made: The soda is dissolved in water, the lime is then added, and the solution can be applied with a brush to the old paint. A few minutes is sufficient to remove the coats of paint, which may be washed off with hot water. Many preparations are sold for the removal of paint, all of them having some basis of alkali. A paste of potash and strong lime is far more effectual in operation, and the oldest paint can be removed by it. Afterward a coating of vinegar or acid should be used to cleanse the surface before repainting. One authority on the subject recommends the gasoline lamp, a quart of oil being sufficient to last 3½ hours. The method is considered superior to gas, as the flame is stronger and the cost less, besides which the lamp can be carried to any part, which cannot be done conveniently with a gas-jet. But the use of flame of either is dangerous, and to be avoided when possible. For removing varnish, spirits of ammonia is used, but it is a slow process, and several applications are necessary. Scraping and sand-papering can be employed; but it must be done carefully by experienced hands, or the surface of wood will be injured. The *Scientific American* notes that the chemical process of removal has the advantage of leaving the surface in a better condition than burning off or scraping, and for large surfaces of paintwork is to be preferred.

PRESERVING A LAWN.—After a lawn has been neatly leveled, sown, and become well set in grass, the main point is its preservation. This is in no way difficult, if frequent applications of fertilizers are made and severe wear is not allowed in particular spots for games or otherwise. Though fine bone is best to seed down with, when it is harrowed into the soil, it is of little or no use when sown upon the grass. Instead of that, a good complete fertilizer, using about five pounds to the square rod, once in a season, after the first spring mowing, will keep it up. An odorless brand is to be preferred. Wood ashes alone will keep up the grass for some time, but when this is used, it is well to apply some nitrous fertilizer occasionally, say a pound of nitrate of soda to the rod, when and where the grass lacks greenness.—*Vick's Magazine for September.*

A "READING LAMP," which is being put in use on the Southeastern railway, in England, is thus described: "It is on the principle of the 'put a penny in the slot' automatic machines. The apparatus is situated immediately over the passenger's head, and under the rack, and is contained in a small box five inches by three inches. The light is of five-candle power, and is obtained by the introduction of a penny at the top of the box, and by the subsequent pressure of a knob, and will last for half an hour, extinguishing itself at the end of that time automatically. If the light be required for an indefinite period, a penny every half hour will suffice. The light can be extinguished at any moment by means of a second button provided for the purpose. This invention will add greatly to the comfort of passengers during night journeys."

THE WORLD'S CONSUMPTION OF COAL.—The total coal consumption of the world is said to amount to more than 1,000 000 cwt. per hour. Of this quantity about 240,000 cwt. are required per hour in order to heat the boilers for stationary and marine engines, locomotives, etc. The production of pig iron requires 100,000 cwt., and that of other metals 80,000 cwt. per hour. The average hourly consumption of household coal is recorded at 200,000 cwt.

A HINT TO INVENTORS.—It is said that the common cowcatcher attachment to locomotives is about the only article of universal use that was never patented. Its inventor was D. B. Davies of Columbus, Ohio, who found his model in the plow. Red lights on the rear car of trains, it is further said, were adopted at the suggestion of the late Mrs. Swisshelm, after a railway accident in which she had a narrow escape.

COAL WITHOUT SMOKE.—A new process for burning coal without smoke, it is said, has lately been discovered. It consists in sprinkling water containing a special preparation of resin over the coal, and the result is that there is no smoke, and the glow is as intense as coke. An English company is to be formed to work the new atent.

CARPETS FROM COWS' HAIR.—By a new process, and by means of perfected machinery, manufacturers in the East are making carpets out of cows' hair, claimed to be superior to woolen carpet This industry will prove of great benefit to the cattle interests of the West in making a market for the hair as well as the hide.

A MOSCOW FOUNDRY fuses metals by electricity. The glare is greater than the sun, and employes work two hours per day.

ENGINEERING NOTES.

Bridge or Tunnel—Which?

The scheme for making a direct connection between England and France has assumed a new feature in the proposition to make a bridge the connecting link instead of the long-talked-of tunnel. The completion of the new Forth bridge and other great advances which have recently been made in bridge construction has so stirred the engineering world that a serious proposition has been made by Schneider & Co., the great French ironmasters, to construct a bridge from Calais to Dover, the length of which will be 24 miles, to be sustained on 120 piers planted in the sea, at a cost of $170,000,000.

The Project Before the French Savans.

A paper upon the subject was read before the late meeting at Paris of the French Iron and Steel Institute, in which it was shown that the construction would occupy about 12 years and require 1,000,000 tons of steel for the superstructure alone. The width of the openings between the piers would be about 320 feet; greatest hight of bridge above water, 180 feet; greatest depth of water, 170 feet. Thus the highest piers would be 350 feet above foundations. Bunker Hill monument would form but a small portion of one of the largest piers if they are to be built of masonry. The piers would undoubtedly be constructed of iron on foundations of solid masonry. The most serious engineering work would consist in constructing the foundations. If they can be properly laid and constructed, the superstructure would present no serious difficulty if the money can be had.

In Laying the Foundations,

All the sand and other sediment which rests on the chalk strata would have to be removed, as the chalk would form the only reliable basis for such an immense superetructure. Valuable information has been afforded by the borings lately made in connection with the proposed channel tunnel.

This Great International Subject

Drew forth many divergent views in the course of discussion. Mr. Daniel Adamson, speaking of its utility, well pointed out whether in the course of the next 10 or 20 years steamship communication would not become so much cheaper that a bridge would not be necessary. He pointed out with regard to Atlantic-going vessels that these were now using only about half the fuel that they consumed ten years back for carrying any given weight, and it was possible that in this department of fuel economy a similar rate of progress might be kept up in the future. The cantilever principle was not to be adopted. The truss-girder system would be employed in the construction.

The Channel Tunnel

Had, Mr. Tylden Wright thought, a better prospect of success than the bridge scheme. He thought the channel-bed was more suitable for a tunnel, and, besides, he believed the cost of a tunnel would not be one-sixth the cost of a bridge.

The Names that Guaranteed this Design

Had, the president thought, been overlooked during the discussion. Sir John Fowler and Mr. Baker believed it practicable, and there was therefore only one formality necessary, namely, the providing of the necessary funds. He had heard that a very eminent financial establishment was prepared to finance the scheme. The project had been seriously considered; it had been beautifully worked out and the calculations on the various departments had been checked by the highest authorities.

The Political Question

And the question of interference to navigation will probably stand in the way of the erection of the structure, but that is outside the province of the institute.

An English Opinion.

London *Iron*, in commenting upon the scheme, says: "It seems scarcely possible to treat seriously this proposal to construct a bridge across the English channel, and yet, we suppose, it must be regarded with a certain amount of gravity, seeing that the project has been broached to and discussed by such an august body as the Iron and Steel Institute. In spite of such sponsorship, however, the scheme can scarcely be said to come within the range of practical engineering. We should have been disposed to treat the matter as entirely outside the pale of reasonable discussion, but for the fact that two such eminent English engineers as Sir John Fowler and Mr. Benjamin Baker have appeared in the character of godfathers to the project by allowing their names to be connected with it as consulting engineers. It is very well for engineers to be daring in their conceptions, but when they approach the chimerical and the impracticable, as in our opinion they do in this case, it is time to utter a protest. We do not mean to say that it is not possible to build a bridge across the channel, with the expenditure of sufficient money and time, but what we strongly maintain is that it would never be a practical success, however much of an engineering one it might be considered; and that, moreover, the objections to it are so insuperable that the scheme stands at once condemned. Let any one think for a moment of the impediment it would offer to navigation.

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☞ *See Advertising Columns.*

Passing Events.

The late heavy rains have started the miners into activity all over this State. The past season was a dry one, and many mills were closed. When water is in short supply the mining industry languishes, but with full ditches, flumes and streams, the gold yield is increased.

Now that the cruiser San Francisco has been successfully launched, the Union Iron Works will go rapidly ahead with the other Government ship for which they have the contract. Having proven that good vessels of first-class type can be built here, these shipyards will have plenty to do in the future.

The gradual rise in the price of silver is pleasing to the mining public. Even when it reaches $1 the discount will be heavy enough—over one-fifth of the real value—but when it continues below that figure great loss is entailed on the silver miners.

A plan to effect the draining of the Gold Hill mines on the Comstock lode is being discussed by representatives of the following companies: Alta, Alpha Con., Belcher, Crown Point, Confidence, Challenge Con., Con Imperial, Caledonia, Exchequer, Justice, Overman, and Seg. Belcher and Mides Con. By the placing of pumps at the 1400 station of the Crown Point incline, the water can be pumped into the Sutro-tunnel connection, and in that manner the mines can be drained down to the 2760-foot level of the Belcher, where valuable ore is known to exist. The expense of the operations will be borne by the companies named.

Time for Action.

It begins to look very much like a necessity for the miners of the Pacific States and Territories to form an association of some kind, or hold a convention, in order that they may bring forcibly to the attention of Congress certain matters which seriously affect their interests. The Interior Department and Treasury Department seem to have altogether too much control over certain details, and their rulings, decisions and constructions are almost uniformly unfavorable to the laboring miners and prospectors.

Congress specially reserved mineral lands from the railroad land grants; yet in California and Montana the railroad companies are obtaining lands known to be mineral in character and to contain mines in operation. Between the deputy mineral surveyors' reports, the Surveyor-General's official maps, the Land Office rulings, and Secretary of the Interior decisions, technicalities and omissions have overcome the real intent of the law. The Montana miners are trying to make a fight in this matter, but their efforts thus far have amounted to little. Their protests and petitions have been pigeonholed and no attention paid to them.

Then the Secretary of the Treasury, by a technical ruling, permits lead ores to come into this country free of duty from Mexico and Canada, though the law puts a duty on lead ores. To this the mining community has vigorously protested, and continues to protest, but without avail. The ruling or decision, which has been in vogue some time, must hold until Congress again convenes. Meanwhile the lead miners of Nevada, Utah, Idaho, Colorado and other sections must practically stop work, while the big smelting corporations of the Southwest grow rich out of this interpretation of the law.

The authorities at Washington appear to care very little indeed for the mining interests of the country outside of coal and iron, in which the Eastern Coast is mainly interested and of which the Pacific Coast has little. Copper is pretty well looked after, too, because there are copper mines at Lake Superior. But silver and lead have a hard time of it, because, perhaps, they are mainly produced on this coast, where we have no special political influence.

It has been exceedingly difficult to accomplish any legislation which would be favorable to the silver interests. Recent events show it has been even more difficult to bring the Departments to a realizing sense of the injustice of the rulings concerning lead. As to contests concerning mineral lands and railroad grants, it appears as if the railroads were obtaining what they want. Between agricultural and mineral claimants the former are getting the best end of the bargain by systems which we have fully explained in the PRESS on former occasions. Of late, too, timberland claimants in the Northern part of this State are trying to cover mineral sections. Another thing; The Government is seriously interfering with the mining industry by the prevention of timber-cutting in mining districts.

All these things are seriously detrimental to the mining industry, but how they are to be remedied is a question. The efforts to combat the evil have so far been mainly by individuals. Some few local organizations have been formed, but thus far no general movement of the mining community has been attempted. Is it not time this should be done? In order to accomplish any permanent good and remedy the evils that are growing, vigorous action is necessary. Concerted action of a large number of people with the same aims and objects can accomplish far more than individual effort, however well directed. If half a dozen or more men prominently identified with the mining industry should get together and start the measure, it would soon lead to a large and powerful organization which would remedy the present state of affairs.

THE sale of the Silver Bell lead mines was closed Saturday to New York and London parties. The price paid was $200,000. The property is located 30 miles west of Tucson.

A SYNDICATE of Chicago capitalists are arranging for the establishment of two large blast furnaces in Seattle, W. T.

STRIKES among the Belgian coal miners are assuming large proportions.

Water and Gold.

As we get more knowledge of working gold ores and more fully realize the importance and difficulty of saving the very fine gold which all of them contain to a greater or less degree, the more must we recognize the fact that the water on which we depend so much, is, in truth, a great thief. Practically all of the processes in vogue for working gold, either in placer or quartz, involve the liberal use of water. Yet where there is any fine gold the water will carry it off in greater or less quantities.

It will be surprising to any one who has never made the experiment to see how long very fine gold will remain in suspension in water placed in a glass or bottle. Not only for hours but for days can fine particles be discerned with a lens, still suspended in the water, when most of the gold has precipitated. If this is the case in still water, how much can the constantly flowing water in batteries or sluices not carry off? Aside from that "rusty" or coated gold which refuses to amalgamate, large losses are constantly going on by reason of the tendency of very fine gold to "float" or remain in suspension in agitated water. There are places in this and other countries where floats covered with sheepskins are placed in rivers to collect these floating particles of gold. How far from the source the gold will be carried no one knows, but that it will go a long distance is certain.

It is not too much to predict that as we become more economical and careful in our methods of working gold ores and other auriferous material, the greater will be the tendency to work such ores and material with as little water as may be. Perhaps the miners of the future will depend on a dry process as much as we do in these days on the wet ones. The objection to such dry methods as have been advocated are mainly because they are comparatively slow; but possibly we can make more money by doing things slower. There is no better amalgamator than the old-fashioned arastra, but it is not a machine that can be hurried to advantage. It is possible that the element of time in amalgamation has not been sufficiently recognized. Mexicans, who are good metallurgists, do not work ores as rapidly as we do, but they get more out of them as a general thing.

Much improvement has been manifest of late years in the working of gold ores, but it has been mainly in the direction of attention to details, care and less extravagance and waste. There has been no radical change in processes. We can work ores cheaper and to a higher percentage than formerly, so that mines that would not pay 10 or 15 years ago are profitable now. Yet there is still a percentage of loss, which we ought to stop. How much of this is due to the quantities of water we use it is difficult to determine. It is very well understood, however, that such ores as have much fine free gold are hard to work anywhere near the fire-assay value. All gold ores and earth have more or less fine gold, much of which we now lose by our methods. At any rate, if we get rid of using water, one well-known element of loss will be avoided.

TUOLUMNE MINES.—Our correspondent "Argus" writes us to add to his communication (printed on page 336 of this number of the PRESS) that the "corrected amount of the yield of the last pocket in the Divol Bonanza is $80,000, not $100,000." Also in speaking of Maltman's chlorination works, he says: "Mr. Maltman intends at once to make considerable additions to his works, among them a dry pulverizer and a stamp-mill, so that miners can have their rock reduced, concentrated and chlorinated at his mill. To those miners having no crushing appliances this is a desirable advantage."

S. C. HOUGHTON, Master in Chancery of the Circuit Court, in company with Messrs. Barstow, Herrin, C. W. Cross and L. L. Robinson, has been examining into the workings of the North Bloomfield and Omega mines in connection with the alleged contempt of the owners in violating the decrees of the court.

AN English syndicate with several millions back of it is trying to acquire the proprietary rights of certain American patent medicines.

TWO HUNDRED tons of pig iron were shipped from Port Townsend to San Francisco last week.

The New Sutro Tunnel Scheme.

Superintendent Thomas of the Sutro Tunnel suggests the following novel and economical plan for draining the flooded levels of the Comstock mines, which is receiving the serious consideration and general approval of experienced engineers.

It is proposed to place powerful air-compressors at the mouth of the tunnel, to be operated by Pelton wheels driven by the water flowing through the tunnel, which will include also that raised to the tunnel level by a series of pumps of a combined water-lifting capacity of eight million gallons per day. These pumps are to be operated by compressed air furnished as above described.

The plan outlined is regarded as perfectly practicable and will give renewed life and activity to operations on the whole line of the lode. The vast amount of power developed by the waste water of the tunnel will admit of prospecting to much greater depths than ever before reached, as well as working profitably a large amount of low-grade ore that cannot be handled by any other means.

The vast amount of power saved by the use of the Pelton wheels in the Chollar shaft by electric transmission, and in the C. & C. shaft by cable transmission, has already made available immense quantities of this class of ore, furnishing employment to a large number of men. Compressed air has in many cases advantage over any other system of transmission, especially for deep workings, as the air, liberated, cools and freshens the underground chambers in a way to greatly facilitate work. A somewhat similar plant is, we understand, under construction for the Commonwealth mine in Colorado. Pelton wheels are to be operated on a stream about half a mile from the mine, which are to run powerful compressors, the air so furnished to be conveyed to the mine for the purpose of running the mill, hoisting-works, pumps, etc.

The mining interests of the country are now being greatly promoted by the increased attention given to the utilization of water-power, both by direct application and the various methods of transmission so successfully employed, the Pelton wheel being very largely used for generating such power, from the fact that it will work with the highest efficiency under any head and every variety of condition.

River-Bed Mining.

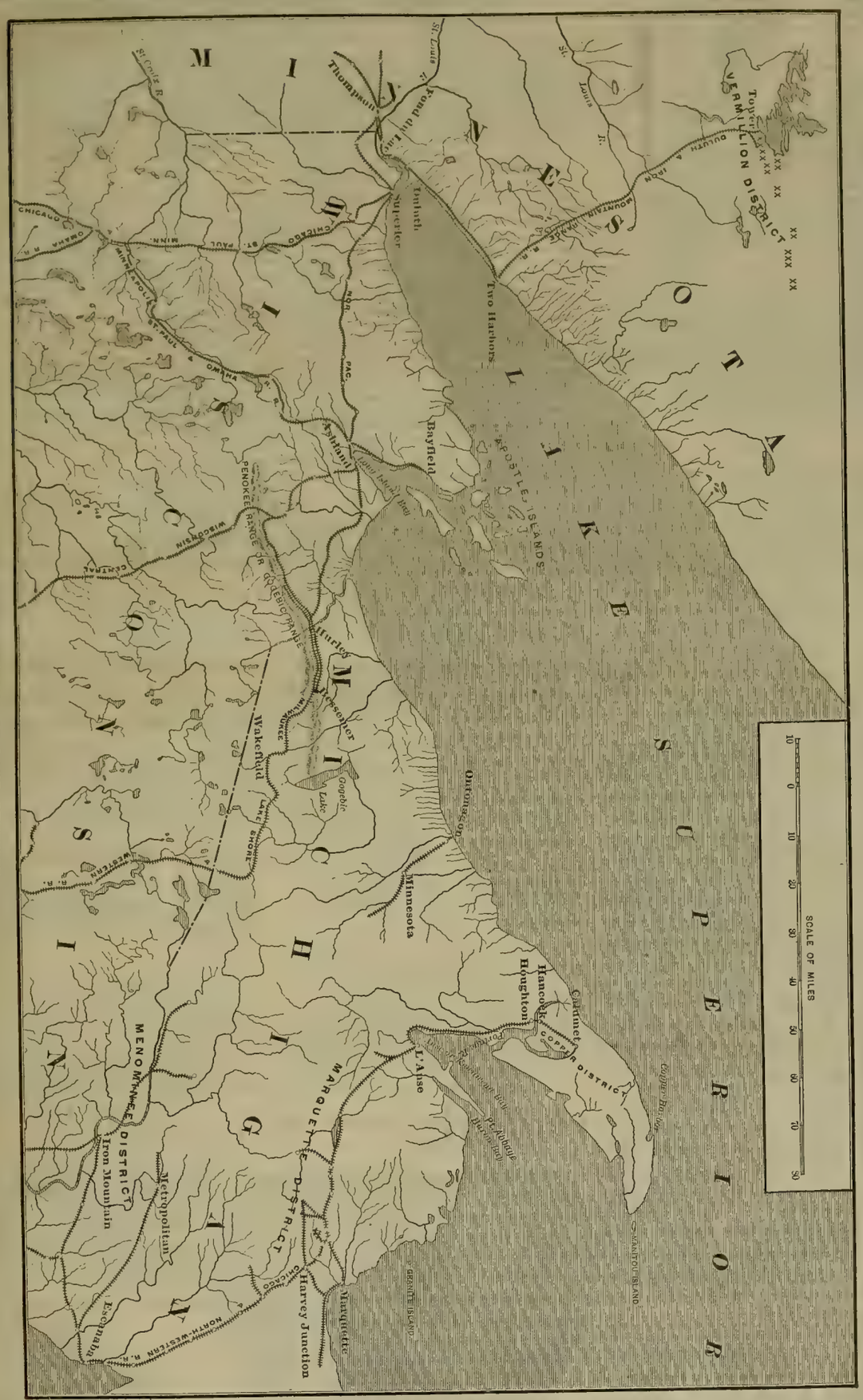
The big river mining schemes have been in hard luck of late. The Big Bend enterprise did not pan out as expected, and now a similar claim on the same river has met with disaster. The heavy and continued rains raised the Feather river so high that it went over the dam of the Golden Gate mine, near Oroville, and into the river-bed, where the men had just commenced to work. The loss is said to be $100,000, but that can hardly be the case unless both flume and dam are destroyed.

It often happens in river-bed mining that the first rise in the river washes out the dam and whole outfit. In this case, however, the managers of the Golden Gate were supposed to be prepared. The immense flume was carrying all the waters of the river, and it was expected it would continue until late in the season. The dam was 50 feet high and built to withstand a flood. The projectors realized the usual danger in such schemes and were supposed to be prepared for it. They had only been at work in the river-bed a short time and are said to have found very good prospects.

The general scheme is to divert the river from several thousand feet of its bed, by means of a dam and flume. If these were destroyed the amount of damage stated might have occurred, but the mere overflow into the bed again could cause no such amount of loss. Should the flume be all gone, the work of blasting out the rock for its bed is all done and it could be replaced for much less than the original work. The flume to carry the river is 50 feet wide and 3300 feet long. Mr. N. A. Harris and Frank McLaughlin will doubtless go to work again in the spring to put the claim in shape for work. It would not take more than a month's work in the river-bed to pay for all the labor if the claim is half as rich as thought for. In fact they expected to work the whole piece out in a couple of months. Had the heavy rains held off a few weeks longer, all would have been well.

Mines of Lake Superior Region.

To illustrate the geographical position of the prominent mining developments of the Lake Superior district, the annexed map has been prepared. In it no effort has been made to locate undeveloped properties; and the discoveries of ores in the Dominion of Canada, some



of which are mentioned later, are not shown. The only reference to ore properties which are not opened as mines and shipping ore are the *xx* marks east of the Vermilion lake in Minnesota, which are introduced to show the general strike of the ore in that region.

The shipping ports for the iron ores and their present railroad connections are indicated. Other lines are building or projected, but as they could not all be shown correctly, the completed roads only are represented. Marquette acts as a shipping-port for part of the iron ores from the Marquette range, and St. Ignace to the east (not shown on the map) also receives some ore. Escanaba ships the ore from the Menominee range, also part of that from the Marquette range, and some of the ores from the Gogebic range. Ashland is the natural shipping-port for Gogebic ores, and those from Vermilion district are shipped at Two Harbors.

In the Menominee iron district the principal mines are the Chapin, Norway and Vulcan. Others which have achieved prominence as large producers are the Ludington, Commonwealth, Perkins, Florence, Iron River, Quinesee and Cyclops.

In the Marquette region there are several large producers of iron ore. Those which have produced over 1,000,000 tons are the Lake Superior, Cleveland, Jackson, Republic, Champion and New York. Among other producers are the Lake Angeline, Barnum, Humboldt, Michigamme, Winthrop, Saginaw, Salisbury, Pittsburg and L. S., Cambria and McComer.

The Vermilion iron ore mines, in Minnesota, have been developed since 1883. Now a railroad has been constructed extending through the forest for 70 miles to Two Harbors, and 26 miles farther along the lake shore to Duluth, and over 5000 people living around the mines are dependent on the 1300 men engaged in extracting the ore from the mines. To reach the Vermilion iron-ore regions, the Duluth and Iron Iron Range railroad skirts the northern shore of Lake Superior, from Duluth to Two Harbors, where the shipping docks, with a capacity of 14,000 tons, and railroad settlement are placed. From Two Harbors the road follows a general northwest direction, rising in the first three miles 400 feet, and in the first 12 miles 1100 feet, to the summit of what might be called the Coast Range, then crossing the drainage area of the St. Louis river to the Messaba range, a ridge of granite, where explorations are now in progress for magnetic ores. Continuing 15 miles beyond the Messaba range, the Vermilion iron-ore mines are found at an elevation of 900 feet above Lake Superior.

In some of the mines the workings have been open quarries, but preparations are being made, and shafts sunk, for underground operations. The statement has been made that although the thermometer frequently indicated from 30 to 40 degrees below zero, it was not found necessary to suspend work day or night during the past winter in these open pits. Many of the houses at the mines are owned by the operators; the iron company leasing the ground for a term of years at a nominal rental, and permitting the owner of the house to dispose of it to persons in the employ of the company. The ore being hard and dense, lying practically free from any foreign material, except the generally well-defined seams of jasper and "soap-rock," demands the use of rock-drills and high explosives; but as comparatively little must be taken out besides the ore, the cost for explosives per ton of ore is less than is generally estimated.

If the development of the Vermilion iron-ore district is startling, that of the Gogebic iron range in Wisconsin and Michigan is even more so; for although the existence of visible outcrops of ore was well known, and considerable amounts of money were expended by some of our large iron companies, no actual exploitation can be considered as having been made until the year 1885, when railroad connections were completed to Ashland and dock facilities provided.

The district is now dotted along the strike of the ore-bearing rock with progressive towns, having an aggregate population of between 15,000 and 20,000 people. The development along the apparent strike of the ore covers nearly 20 miles in length, and active exploration is in progress for as great a distance both east and west of this territory and also upon a parallel ridge 12 miles south, the latter being for magnetic ore. The center of the present developed iron-ore properties is near to the Montreal river, which forms the boundary between Wisconsin and Michigan; the largest producers up to the present time are, however, chiefly in the State of Michigan. The ores in the Gogebic range differ from those of the Vermilion range in being softer, and, therefore, more easily mined, yielding less iron and also less phosphorus, but carrying a greater percentage of manganese, and more moisture. The dip of the Vermilion ore is nearly vertical; that of the Gogebic ores approximates 70 degrees.

The recent development of the copper mines on the Keweenaw Peninsula has been less marked than that of the iron ores of Lake Superior region; but, notwithstanding the active competition caused by the opening of large Montana and Arizona mines, the progress has been very satisfactory and the Lake Superior mines are operated successfully, where the material extracted yields less than one per cent of copper. The equipments which are connected with these mines, and which in 1880 raised the ore from depths of 2500 feet, but now elevate it 3800 feet, are marvels of American ingenuity, and the appliances for separating the native copper from the gangue are wonderfully complete. The depths of the shafts of the Calumet and Hecla copper mine are reported as follows: Calumet Branch No. 1, 3900 feet; No. 2, 3800 feet; No. 3, 3400 feet; No. 4, 3800 feet; No. 5, 3400 feet; Hecla No. 1, 3800 feet; No. 2, 3800 feet; No. 3, 3300 feet; No. 4, 900 feet; No. 10, 800 feet; No. 11, 1200 feet; No. 12, 1100 feet.

The principal copper mines are the Calumet and Hecla, Quincy, Franklin, Osceola, Atlantic, Central, Huron, Allouez and Copper Falls.

In a review of the Lake Superior mining in-

THE MINING REGIONS OF LAKE SUPERIOR.

dustries, Mr. C. D. Lawton, Commissioner of Mineral Statistics for the State of Michigan, says: "Copper mining in Michigan has become a very uniform industry; prices may vary, but the work at the mines goes on steadily with little apparent change. There is all the while a gradual increase in the magnitude of the operations, resulting in an increased production and a corresponding lessening of cost. Few, even of mining men, who are not acquainted with the details of the work at our Michigan copper mines are ready to give credence to the statements that rock which has a gross value of but $1.65 per ton, or less than 15 pounds of refined copper, on an average to the ton, can be mined at a depth of more than 1000 feet below the surface, hoisted, broken, stamped, washed and separated, smelted, taken to market and sold, and still leave a net profit of 22 cents on every ton. Each year as the price of copper has diminished the daily production has been increased in order to reduce the average cost. In 1876 the cost of stamping and washing was 88 cents per ton, while now it is but 30 cents. The mine is no richer than formerly; in fact there has been practically no change in the quality of the rock. The advantage gained is due to improved facilities for mining and manipulation, to a better comprehension of the work, etc. No business in the land of equal magnitude is more systematically and carefully conducted than is the copper industry of Michigan. There is none more legitimate, or that is conducted with more freedom from speculation and from those manipulations of stock which unfortunately too frequently characterize mining." These facts are condensed from a paper read before the American Institute of Mining Engineers by John Birkinbine of Philadelphia, Pa.

COTTON MANUFACTURES.

Cotton Culture in California.

Experiments have fully proven that cotton can be grown in this State and at a handsome profit when all the conditions are favorable. It would be a great gain to the State if the large extent of river-bottom land suitable to its growth could thus be realized. The following experience of J. W. Moore of Bear valley, San Diego county, was recently given to the editor of the San Diego *Sun:* In 1887 he raised 35 acres of cotton on his Bear valley farm. The field yielded about 6000 pounds, for which he received three cents per pound. Cotton culture did not pay because he had no gin-mill with which to separate the cotton from the seed. He stated, however, that he had had a great deal of experience raising cotton in the South, and that cotton would grow in San Diego county just as well as in Texas, provided it was planted in good corn ground. He also believed that it would do well upon mesa ground if properly irrigated.

Cotton has also been raised to some extent in the San Joaquin valley. Experience has shown that it could be raised there at a fair profit if we had gin-mills to separate the seed from the lint and a home market for its sale. In regard to the latter, the *Journal of Commerce* of this city has the following: The cotton industry here is in a flourishing state, the California Cotton Mills having been a success from the start, albeit they have to obtain most of their material from Texas. What it would be if they could obtain it in the State and at a reasonable figure may be dimly conjectured by the success already achieved. Every year the local industry has had to boast of a record surpassing its predecessor. Duck, twine, battens, crashes, bagging, toweling and cotton rope are made, and meet with ready sale.

The raw material can be raised in this State at a profit of [4@6 cents per pound. It can be grown to greater advantage in Tulare and Kern than in Texas, where we now get our supply. Cotton raised on one or two thousand-acre lots would be a very profitable industry in the State. The planter is not troubled by inclement weather or rains at time of picking, etc. We have many advantages over other States in this regard. We should utilize them. The manufacturing consumption now can give employment to 10,000 bales of 500 pounds each. The future would increase this in a very great degree. The consumption of the United States is about 2,000,000 bales annually. This would give, on the basis of population, about 60,000 bales to the Pacific Coast, to say nothing of export, so that there is room for a great cotton industry among us.

Since the above was in type, our attention has been called to the following paragraph from the San Diego *Sun* of Oct. 10th, which presents still further evidence that

Cotton-Growing in California Will Pay.

The ease with which cotton may be grown in Southern California has been proved more than once in San Diego county, where cotton of the finest sort, and of the perennial habit, has been produced with little or no irrigation. Some samples recently brought from Perris and entered in the Chamber of Commerce display compare with the best Sea-Island grade. They came from plants that had only been watered twice since the seed was put in the ground. From this and other demonstrations made within the past 12 or 15 months, it is fair to infer that cotton is as natural to the soil and climate of Southern California as grapes, figs or apples.

Would the cultivation of it pay? That is a question that ought to be considered. Without specific information on that point, the *Sun* will venture to say that it promises better returns than barley, to which so many of the farmers of this county have given their time without good pecuniary results. It is likely, too, that there is more money in cotton than there is in wine grapes or melons. One item that must not be lost sight of in the financial part of the discussion is the perennial qualities of the plant in this latitude, and the smaller cost of production which depends upon that fact. The ordinary Gulf State and Sea Island cotton has to be replanted annually, therefore the California farmer, who can get along for seven or eight years without renewing his plants, ought to compete with Southern producers to a very great advantage, certainly in a way to control the trade in the far West. Given a market, such as near-by cotton manufacturers could provide, and there is little doubt but that cotton production on a large scale would pay the farming community. There is cheap land enough, outside that adapted to citrus fruits and English walnuts, to provide the right ground plan for competition with the South. For the final labor involved, negroes could readily be imported when cheap Chinese or female pickers were lacking.

The Cotton Crop.

The present season's cotton crop promises well for a large yield. A month ago the crop was set by good judges at not less than 7,500,000 bales. During the past month some untoward circumstances have reduced this estimate to about 7,000,000 bales. The cotton returns to the Department of Agriculture on October 1st showed a large plant growth, an active opening of the bolls, fiber in good condition and generally fine weather for picking. But the crop is reported late at least two weeks. A general percentage of 81.4 of a full crop was the estimate October 1st against 79.8 at the same date a year ago.

A large crop, says the *Boston Journal of Commerce*, is greatly needed, and should the price of it rule on the basis of ten cents a pound for middling grade, it will be readily absorbed in spinners' demands. The present high price of cotton is due to the shortage of supply, which is specially evidenced in the present condition of cotton manufacturing in England and so admitted by those engaged in it. A crop of 8,000,000 bales would not give a surplus. We rather anticipate a slow arrival of cotton at the ports, at first, owing to the stand of the planters' alliances concerning bagging material, unless a change of feeling should take place that prices will rule higher in the early part of the season than later, which may induce the planters to bale their cotton in the hated jute bagging till a sufficient quantity of the cotton material can be had.

Before the war the high-water mark in cotton was 5,300,000 bales. The crop of last year is not yet entirely out of the hands of the planters, but those whose business attention is absorbed by the staple place the amount remaining on hand at not over 60,000 bales. If this season's yield reaches 7,000,000 bales, it will be worth more than four times as much as all the gold and silver produced in the United States for the year.

The World's Consumption of Cotton

Is annually increasing, being estimated, for 1888-89, at 11,421,000 bales, of which 2,685,000 bales were consumed in the United States. For the past 11 years there has been an increase in the consumption of cotton throughout the world of 52 per cent against an increase of about 40 per cent in the amount of production. In the last five years the European consumption of cotton has increased 18 per cent, while the population has increased only 5 per cent. For the same period the United States consumption has increased 42 per cent with an increase in the population of only 14 per cent, yet the wants of the people are not more than satisfied. A United States crop of 7,800,000 bales would not overstock the markets of the world, even with the usual supply coming from India and elsewhere. There has been a conspicuous increase in the number of spindles in the Southern States of late years.

COTTON MANUFACTURING IN ENGLAND.—Our English advices represent cotton manufacturing in the Lancashire districts as unsatisfactory. At the current prices for cloth it is impossible to convert the raw material into a manufactured product without a loss, which renders the situation peculiarly serious, the continuation of which must result in the stoppage of the mills. Already a large number of the looms are stopped because of a lack of orders at a profit, and their starting up again will depend upon the distribution of goods which are now held in considerable quantity by dealers and foreign agents. This condition of manufacturing has existed for some time, growing worse with time. Ellison noticed it in his July report, speaking of sales as falling short of the outturn of the mills, causing many looms to stop. Spinners felt the effects of dullness in the early part of the summer, causing a marked falling off in their demands for cotton. There is little prospect of an improvement till cotton declines in price very considerably. At present prices there is plenty of cotton, with goods as they are, receiving little attention from consumers. The price, alone, of cotton keeps the demand for it within the limits of its supply.—*Boston Journal of Commerce.*

Cotton Manufacture at the South.

The past year has been a phenomenal one in the progress that has been made in building cotton-mills at the South. The record greatly exceeds that of any previous year. In addition to the new mills built, many have been greatly enlarged. The number of mills throughout the South in 1880 was 161. The present number is 355. The increase in the number of looms shows a much larger proportion of increase—from 14,323 in 1880 to 45,001 in 1889. Georgia still leads, but South Carolina follows close behind.

Hitherto the goods manufactured have been almost exclusively of the very coarsest kind, the most conspicuous, or what are known as Southern plaids, or "negro plaids," on account of their extensive use by both males and females of that race. It is said that an overproduction of that class of goods is becoming apparent.

It is now proposed by a correspondent of the Baltimore *Manufacturing Record* that Southern mills be equipped for the manufacture of fine goods. He denies the statement that their climate is unsuitable for such work and declares that the skilled help required can readily be secured in the South—that the manufacture of print cloth could be profitably carried on in the South. It would be well for the Southern mills to move in this matter moderately, but there is no reason why the help in Southern cotton-mills cannot be easily taught to manufacture the finer counts, and we predict that within ten years such mills as the Piedmont, Clifton and Pelzer of South Carolina, and others throughout the South that are equipped for changing to the finer goods should they so decide, will find it greatly to their advantage, pecuniarily. There is also a profitable field for the Southern mill in the manufacture of the finer grade of ginghams, but they have not improved their opportunity in this direction, and chiefly because of the accepted notion that it is not profitable for them to manufacture them.

OUR COTTON IMPORTS.—Our domestic crop of sea island is not sufficient to supply the increasing demands for cottons suitable for the combing machine. Hence the employment of the long-stapled cotton of Egypt and Peru is becoming more general among the fine cotton-mills of New England and elsewhere. For the year ending June 30, 1889, there were imported into the United States 7,973,139 pounds of foreign cotton, being an increase over the amount imported during the year before of nearly 2,500,000 pounds. Most of this cotton was Egyptian, shipped from the Liverpool market. The cotton spinners of Great Britain, especially those about Bolton, are increasing their demands for long-stapled cotton for fine spinning. The Egyptian stock is low at present, and appearances seem to indicate a limited supply and high prices till the new crop makes its appearance in the latter part of October.

THE ADVANTAGES OF COTTON MANUFACTURE. It is of high importance to California to obtain some product to work up and export. If cotton would answer, then the sooner it is produced and made up, the quicker will the time arrive when trans-Pacific steamships can solve the problem of return cargoes from this port. We cannot send barley nor fresh fruits across the ocean. In manufactured articles must be our principal reliance for the Oriental trade. How important, therefore, it is to arrive at definite conclusions about what can be had for manufacturing purposes, and to obtain the product is a matter to which everybody's common sense can lend the needed emphasis.

SUPPLIES REQUIRED BY A COTTON-MILL.—Few persons realize the enormous amount of supplies required for a large cotton-mill. From the annual statistics of the manufactures of Lowell, we find that the Lawrence Manufacturing Company of that city uses 278,293 pounds of cotton per week, 9936 tons of coal per year, 17,879 gallons of oil per year, and 280,146 pounds of starch per year. This company turns out per week 696,526 yards of cloth, 17,046 dozen hosiery, and 900 dozen shirts and drawers. It employs 2089 females and 1051 males, and the power is furnished by seven turbine water-wheels and five steam engines.

Complimentary Samples.

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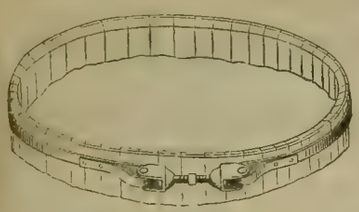
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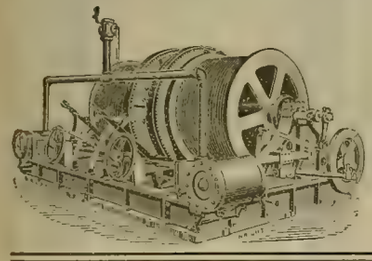
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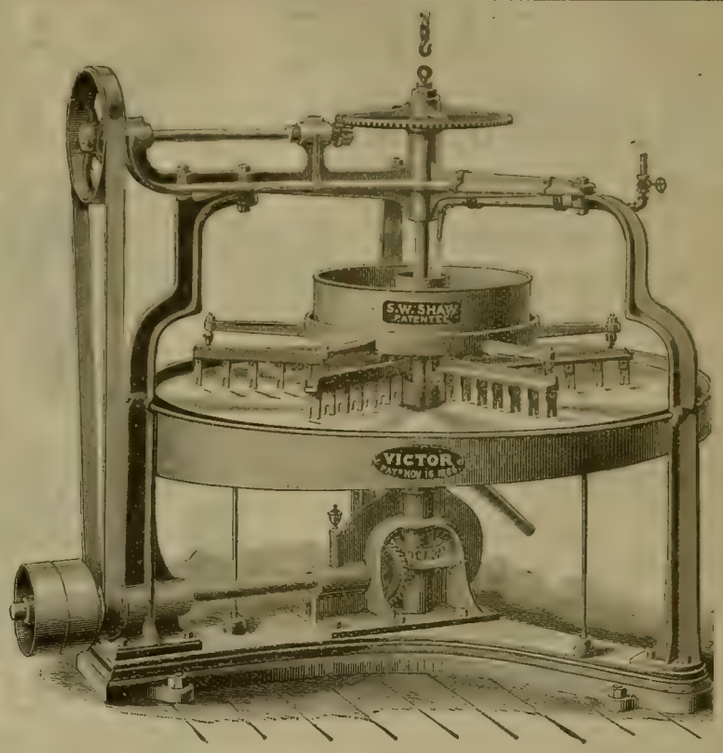
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☞ Will report on the condition and value of any mining property on the Pacific Coast. Rare Chemicals made to order. Instructions given in Assaying and Practical Chemistry.





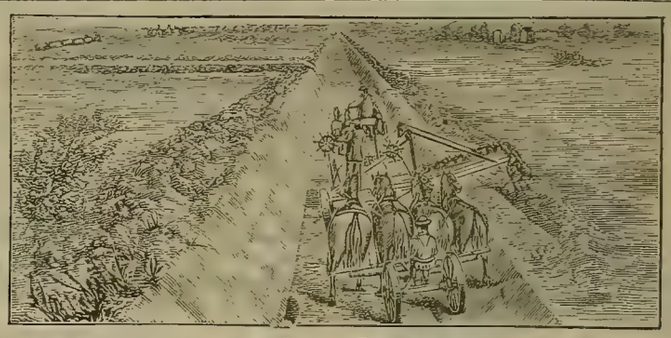
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Having passed the experimental stage, is now offered to the consideration of the mining public, in full confidence that it will meet satisfactorily all reasonable requirements. In operation it is unlike any other machine of its class. The concave disc having a rotary reciprocal motion, causing the waste sands to flow over its periphery continuously, while the sulphurets are also drawn continuously through its center, the whole process being automatic and complete. The Batea in the hands of an expert is known to be the nearest to perfection for concentration. This is the principle upon which this machine works. The advantages gained are:

1. Greater capacity with more perfect work.
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4. The first cost is less than other machines of much less capacity.
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Mine owners and millmen are invited to carefully examine the Victor before deciding upon their concentrating works. Address

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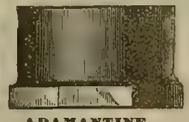


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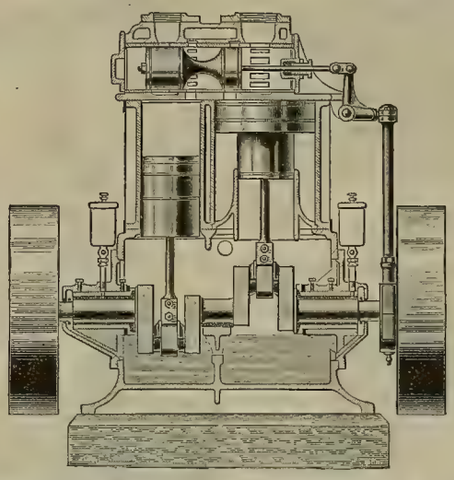
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SALES DURING LAST FOUR MONTHS:

COMPOUND, 44 ENGINES, 5215 HORSE POWER. STANDARD, 99 ENGINES, 4500 HORSE POWER. JUNIOR, 166 ENGINES, 4260 HORSE POWER.

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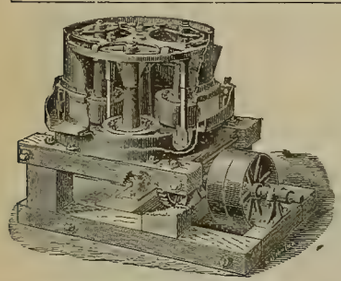
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The **H. H. H. Liniment** is for the treatment of the Aches and Pains of Humanity, as well as for the ailments of the beasts of the fields. Testimonials from importers and breeders of blooded stock prove its wonderful curative properties. No man has ever used it for an ache or pain and been dissatisfied.
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To Run your Mills, Hoists and Trams.

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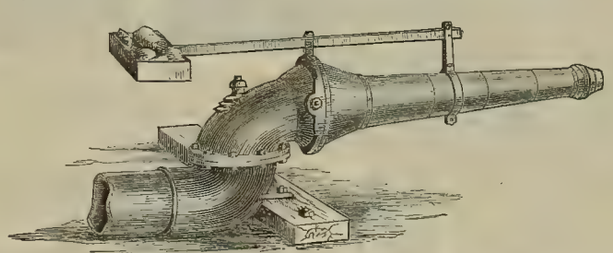
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Automatic Safety Clutch

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Simplest, Strongest & Most Reliable.



Constructed upon Scientific Principles.

Operates and Sets Automatically and Ever Ready for Service.

Entirely free from all springs, pawls, triggers, governors and other unreliable parts likely to stiffen, corrode or gum up.

ALWAYS IN FULL SIGHT, BUT NEVER REQUIRING ANY ATTENTION.

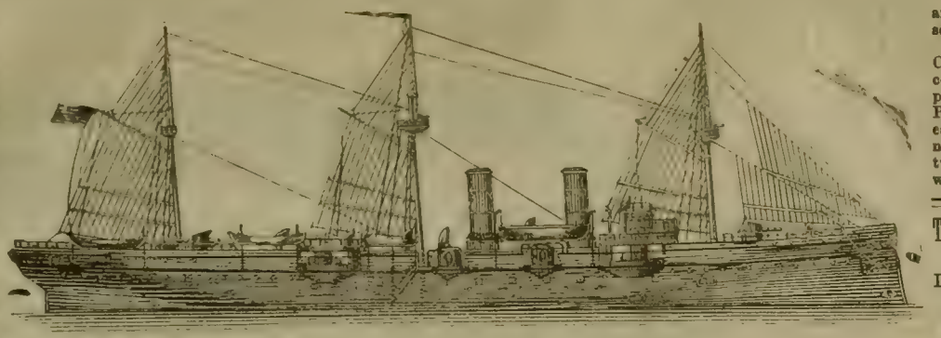
Has been practically tested in six actual elevator accidents and saved 51 persons from injuries and death.

SILVER MEDALS awarded by the Mechanics' Institute in 1880, 1882 and 1883. SEMI-CENTENNIAL GOLD MEDAL awarded by the American Institute of New York, Dec. 3, 1887. Apply to

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218 Post St., San Francisco.

The San Francisco.

The cruiser San Francisco was launched from the shipyards of the Union Iron Works on Friday last, the launch being successful in every way, and largely attended notwithstanding the rain. An unusual feature was the promptness, the vessel leaving the ways at exactly the appointed time. The San Francisco, a view of which is given on this page, is the second of the cruisers built for the U. S. Government by the Union Iron Works of this city. Her dimensions are as follows: Length over all, 326 feet; length on water-line, 300 feet 9 inches; breadth of beam, 49 feet 1½ inches; depth of hold, 21 feet; displacement, 4083 tons. She is expected to develop 10,500 horse-power. According to contract she must steam nineteen knots per hour. The Government will pay a premium of $50,000 for every quarter of a knot in excess of that speed, and will exact a penalty of the same amount for every quarter of a knot she falls below it. The contract price was $1,428,000.



THE CRUISER SAN FRANCISCO, CONSTRUCTED BY THE UNION IRON WORKS.

There are four boilers, which are now set up in the yard preparatory to being lowered into place. Each one is 18 feet 3 inches long by 14:10 in diameter, is tested to 225 pounds to the square inch, built for a working pressure of 165 pounds, and weighs complete 132,000 pounds. They are the largest boilers ever attempted on the coast, and were built here throughout. All the machinery is aboard that can be put in place before the engines and boilers go in. The hull of the cruiser is completely finished, the decks calked, the circulating and feed pumps in, etc. The vessel presents a more pleasing appearance on the water than the Charleston, and when rigged will be a finer looking one. She will carry three masts with a sail area of 5400 feet. The citizens of San Francisco will present a silver service to the vessel when she is in commission.

The Union Iron Works have a great deal of work already done on another government vessel, the keel of which will be immediately laid in the place vacated by the San Francisco.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific States.

FOR WEEK ENDING OCT. 22, 1889.

413,427.—SEWER—Henry Anderson, S. F.

413,382.—BUCKLE—C. W. Bassett, S. F.

413,438.—BATTERY ZINC—F. F. Eggers, S. F.

413,250.—RECORDING COMPASS—C. O. Farciot, S. F.

413,443.—ORCHARD CULTIVATOR—L. A. Gregg, San Jose, Cal.

413 278.—CONCRETE PAVEMENT—T. F. Haggerty, S. F.

413,446.—ROLLER BEARING—R. W. Hent, S. F.

413,511.—HOLDER FOR SASHES OR BLINDS—W. S. Holland, Pasadena, Cal.

413,400.—WASHING MACHINE — J. Lachance, East Portland, Ogn.

413 535 —REFINING COPPER, ETC.—G. G. Mullins, Los Angeles, Cal.

413,536.—REFINING COPPER, ETC.—G. G. Mullins, Los Angeles, Cal.

413,470.—SPECULUM IRRIGATOR—E. H. Woolsey, Oakland, Cal.

The following brief list by telegraph, for Oct. 29, will appear more complete on receipt of mail advices:

California—Isaac Sylvester, assignor of a half to R. A Gray, Colusa, cultivator; William H. Snow, Oakland, packing-box; Jacob Reeder, Fresno City, insecticide; Almarin B. Paul, San Francisco, ore-concentrator; Emery T. Nichols, assignor to the Nichols Manufacturing Co., San Francisco, rotary steam-pump; the same, a fruit-pitting machine; the same, a lifting-jack; Pontalba L. Nash, Hollister, over-draw bridle attachment; Elisha Haines, Sacramento, solder-melting furnace; Evarista Chatain and S. Gilett, San Francisco, concrete-mixing machine; Enos Churchill, Tulare, and assignor of half to W. L. Morrow, San Luis Obispo, washing-machine; Jules de Rose, San Francisco, corn-planter; Adeline T. Evans, St. John, combined flour-sieve and scales; George W. Bassett, Lower Lake, combined pulverizer and cultivator.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable prices, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

AUTOMATIC RECORDING COMPASS.—Chas. O. Farciot, S. F., assignor of two-thirds to N. W. Spaulding and Chas. Goodall. No. 413,250. Dated Oct. 22, 1889. Considerable difficulty is often experienced from the erratic steering of vessels when in charge of inexperienced or careless men, so that the vessel may often be found to be a considerable distance from her true course, and when approaching dangerous shores it is often the cause of great disaster. In order to provide a means for indicating at all times the course upon which a vessel has been steered and provide a permanent memorandum for future use, Mr. Farciot employs a traveling band or tape, which may be moved by clock-work at a fixed rate, and in connection therewith indicating points or markers so connected with the compass-needle that the course will be instantly shown by inspecting the strip or surface upon which the marks have been made. The course of the vessel is in this way automatically registered, so that upon inspection at any time the course which has been steered at any given hour or time may be known. This device is very ingenious, and the invention one of great importance.

SEWER.—Henry Anderson, S. F. No. 413,427. Dated Oct. 22, 1889. In order to make a strong and imperishable bottom, and also to retain it at its proper grade independent of such settling as may take place from time to time in the surrounding soil, the bottom of this sewer is formed of iron of proper curvature and shape to produce the best results in speed and current scouring effect. This bottom is made in sections of any suitable length and the sections are made to overlap each other by means of a joint in each, so secured together as to present a perfectly smooth interior surface. The upper portion of the sewer may be made of brick, concrete, or of wooden staves united with the upper edges of the iron bottom by suitable clamps or straps.

PROCESS OF MANUFACTURING BATTERY-ZINCS. Frank F. Eggers, S. F. No. 413,438. Dated Oct. 22, 1889. Various methods have been hitherto employed for the manufacture of zincs for battery use, in some of which zinc is heated or melted and amalgamated with mercury and either cast into the proper form or left in a pulverized condition. Mr. Eggers combines the metal zinc with mercury and afterward compresses the compound into a bar of the proper form for use. This method of forming the bar makes it somewhat porous or spongy, with insterstices throughout its substance which increase the surface upon which the battery liquid can act; and it is found by this construction that the effective power of the zinc-pole of the battery is greatly increased, while at the same time it will always remain bright and untarnished until it is entirely used up.

ORCHARD CULTIVATOR.—Leslie A. Gregg, San Jose, assignor of one-half to F. Plank. No. 413,443. Dated Oct. 22, 1889. The invention relates to that class of cultivators especially adapted for orchards, in which a wheeled frame carries a number of freely suspended teeth or lags and provided with devices for raising and lowering them; and the invention consists in freely suspended and laterally swinging side teeth or lags and means for raising and lowering them and moving them in and out from the sides of the frame. The object of the invention is to provide a cultivator, the working width of which can be readily and instantly varied by throwing or swinging said side teeth or lags further out or drawing them in as occasion requires, thereby cultivating the ground between the trees of an orchard and avoiding said trees successively.

SPECULUM IRRIGATOR —Dr. E. H. Woolsey, Oakland. No. 413,470. Dated Oct. 22, 1889. This invention relates to that class of instruments used for the treatment of the vagina and rectum in which a perforated nozzle or tip is attached to a syringe and is provided with a spring frame whereby the passages are expanded to permit inspection and proper direction and discharge of the washing fluid. The object of the invention is to provide an instrument of this class in which, by reason of the construction and shape of the expansion frame, the instrument may be readily and conveniently inserted, limited in its insertion, held well in its place, readily withdrawn, and the walls of the passages expanded in proper manner and places, so as to permit perfect inspection, as well as to aid in and allow free egress of water and discharges to effect the cleansing of the passages.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

Mining Personals.

Capt. John Kelley, superintendent of the Bodie and Mono mines, left the past week for the Bodie district.

Hon. J. H. Neff, ex Governor Perkins, Wm. Garratt, and others have bonded a large quartz property in Trinity county.

A. Ekman, chemist and assayer, is making a collection of Butte county minerals to be displayed at the coming citrus fair at Oroville.

A. C. Hamilton, superintendent of the Alpha, Exchequer, Chollar and Potosi mines, in Virginia City, is in this city on official business.

R. P. Keating, superintendent of the Savage and Hale & Norcross mines, Virginia City, is in this city on business connected with those mines.

The Grass Valley *Union* says that Gilbert Gale and A. B. Doresbach intend shortly to commence mining operations on a ledge near Cherokee.

O. C. Steel, superintendent of West Con. Virginia mine, Virginia City, is in this city for instructions regarding more important work in the mines to be commenced at an early day.

The death of John Crockett, for 16 years secretary of the Belcher Mining Co., which occurred on Saturday last, is deeply regretted by all who were brought in business contact with him.

Joseph Snyder of Grass Valley, who first obtained the bond on the recently purchased Lone Star quartz mine in Sierra county, 12 miles from Downieville, will have charge of the mine for the new owners.

Mr. Archie Farrington, the well-known mining man and superintendent of the Reno Reduction Works, has been examining the Humboldt Queen mine, near Rye Patch, with a view of purchasing the same.

Oro Bella mill, Arizona, which has been idle for want of water, resumes operations about Nov. 1st, under the management of J. D. Helm. Wm. Tyack will have charge in the mine. He will soon increase his force.

Jim Butts, an old-time and inveterate prospector, who used to operate at and below Grass Valley, has for 15 years been living in Placer county. Last year he sold a mine at Ophir for a good round sum, and he has two others which promise well.

Messrs. R. N. Baskin and Jas. McGregor of the Executive Committee of the Crescent Co., Park City, Utah, have spent several days inspecting the mine. They have placed James Hickey, formerly superintendent of the Old Empire, in charge of the works.

Fred L. Buhn, a miner, recently made a discovery while prospecting on the mountain-side near Tehachapi. He found some croppings indicating the presence of coal, and following them up, soon unlaid a vein seven feet deep. Buhn had been at work for a prospecting company, which for some time past had searched all through the country near Tehachapi for coal indications, but with little or no success. His claim is between Mohave and Tehachapi and is within easy reach of the railroad.

George Everhart is the sole resident of Secret Town now, says the Placer *Republican*. He lives alone in a cabin there and was 72 years old not long ago, but he is mining with as much vim as he did in the same canyons and gulches almost 40 years ago. But it does not pay now as it did then.

Mr. N. T. Galloway writes from Red Rock to the *Arizona Enterprise* that in due time the camp of the Red Rock Copper Co. will be a good town. Mr. White, a practical mining man from Leadville, is the superintendent, and H. K. Cole, the general manager, is from the Calumet & Hecla.

The Paradise Valley Company, Wild Rose district, Nev., shipped to Denver, October 19th, 11 tons of ore concentrates. A recent visitor to that district says that J. V. McCurdy, the principal owner in the Paradise Valley mine, is in a fair way to again become opulent from recent ore developments.

A. Loughran, superintendent of the Benton Con., has returned to the Comstock from a business trip to S. F. He says the Benton management is arranging for the resumption of operations in the mine at an early date through the old shaft, over which a substantial steam-hoist plant will be set up.

Prof. P. D. Barnhart, formerly superintendent of the Red Chief mine, on Kanaka creek, has gone to Helena, Montana, to work up a new mining enterprise. C. H. Webster, Jr., a clothing merchant of Binghamton, N. Y., has arrived here to take charge of the Red Chief, so says the *Nevada Transcript*.

Mr. A. B. Paul returned this week to the Calumet mine, Old Diggings district, Shasta county, having been in the city for a month past procuring a 20-ton mill to work by the Paul dry process. The mine has now the largest milling capacity of any in Northern California. There are 24 stamps working wet, and two Paul mills for working ore dry, all run by water-power. Work is carried on all winter.

THE HOME BENEFIT LIFE ASSOCIATION

Life Insurance at Cost—Death Claims Paid in Full and Promptly.

Letters From Insurance Commissioner Wadsworth and Labor Commissioner Tobin.

For eight years the Home Benefit Life Association has been doing business on this coast. As the oldest and most conservative co-operative life association it has been constantly assailed by the old-line companies. Its downfall has been constantly predicted, but it has pursued its course quietly and steadily.

So long as the only attacks upon it were those incident to the plan upon which it worked no notice was paid to them; but false and malicious representations have of late been made so often that the truth should be made known through the columns of the public press.

The Labor Commissioner of the State some time since commenced a commendable investigation into the workings of "co-operative" insurance companies and fraternal organizations. In his list of companies doing business upon the assessment plan was the Home Benefit Life Association. No statement regarding its character was ever made by Colonel Tobin, nor did he term it "wildcat." The list disappeared from his desk, and the next known of it was its publication in an evening paper, with the statement that Colonel Tobin designated as "wildcat" those schemes embraced in the list. The statement was false. It was inspired by malice. The following letter from Colonel Tobin sufficiently proves this:

STATE OF CALIFORNIA,
BUREAU OF LABOR STATISTICS,
220 Sutter Street, San Francisco, Cal.,
October 24, 1889.

President Home Benefit Life Association, San Francisco, Cal.—DEAR SIR: It is not true that I have classed your association as a "wildcat concern." On the contrary, from the returns made in answer to inquiries from this office, and from other reliable information, I have reason to believe that the Home Benefit Life Association is honorably and efficiently conducted. Every facility has been placed at my disposal to investigate its affairs.
Yours truly, J. J. TOBIN, Commissioner.

This letter also shows that the association complied with the request of the commissioner and gave him every facility for examining into the affairs of the association.

From the report made to him it appears that the association paid on account of death claims during the past year the sum of $99,000, and that every death claim presented was paid in full.

This is sufficient answer to the statement that has been repeatedly made in a monthly insurance publication sustained by the old-line companies to the effect that the Home Benefit Life Association did not pay its losses in full. That statement is false, and no attention would be paid to it but for the fact that unprincipled solicitors of other companies, knowing the assertion to be false, yet make use of it in attempts to secure business.

The Home Benefit Life Association has always been ready to come under the jurisdiction of the Insurance Commissioner. This cannot be better shown than by the following letter from Mr. Wadsworth:

OFFICE INSURANCE COMMISSIONER,
STATE OF CALIFORNIA.
SAN FRANCISCO, October 26 1889.

W. H. Chickering, Esq., 101 Sansome Street, San Francisco, Cal.—DEAR SIR: Yours of the 10th inst. requesting me to reply to the following questions concerning the Home Benefit Life Association received:

1. Is it not the fact that that association has at all times, through Mr. Chickering, its president and attorney, aided you in your endeavors to obtain legislation placing assessment insurance companies under your jurisdiction?

In answer to which I reply in the affirmative.

2. Is it not the fact that the company has always expressed a willingness to have you make an examination of the affairs of the association and to come under your jurisdiction?

To which I also reply in the affirmative.

3 Do you know of any instance where the said association has failed to make payment of the entire sum due under any claim presented to it, or has complaint of such failure ever come to your knowledge?

In answer to which I reply in the negative.
Yours respectfully, J. C. L. WADSWORTH,
Insurance Commissioner.

The company issues certificates of membership in amounts from $1000 to $10 000. One of the last claims paid was that upon the life of Wilson White, who carried a certificate in the association to the amount of $10,000; and that the association pays its losses in full cannot be better shown than by the following acknowledging receipt of the amount:

SAN FRANCISCO, Cal., September 22, 1889.

J. O. Cadman, Esq., Manager Home Benefit Life Association—DEAR SIR: On the part of those interested in the collection of the life policy held by the late Wilson White in the Home Benefit Life Association, we take great pleasure in acknowledging the courteous and prompt conduct of the company in settling the claim. The matter was adjusted at once by payment in full ($10,000) without complication or delay. For such conduct the company deserves and receives the sincere thanks of the beneficiaries. BLAKE, WILLIAMS & HARRISON,
Attorneys for the Estate.

Many similar letters could be produced, but it is unnecessary.

The officers of the association are prudent, conservative business men, well known in business circles in this city. The entire salaried list is not one-tenth the amount paid many presidents of the old-line companies. The design of the association always has been, and, so long as its present management continues, always will be, to furnish reliable insurance to its members at actual cost,

UNION IRON WORKS,

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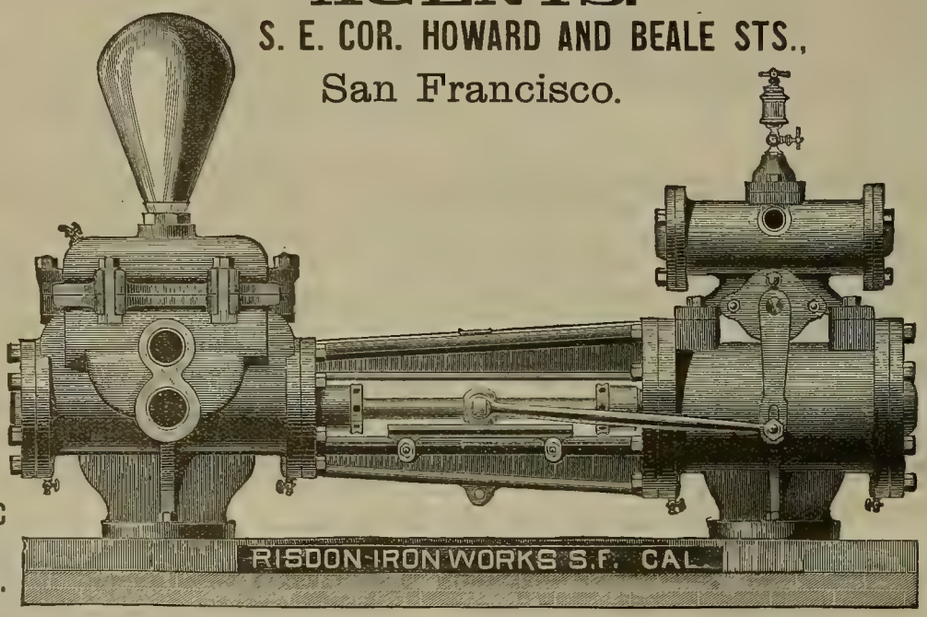
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Vertical Pumps,
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Air Pumps,
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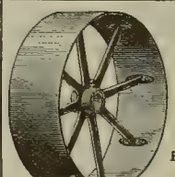
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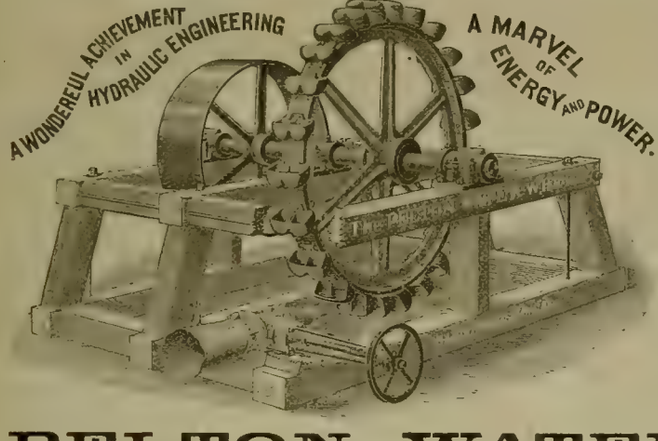
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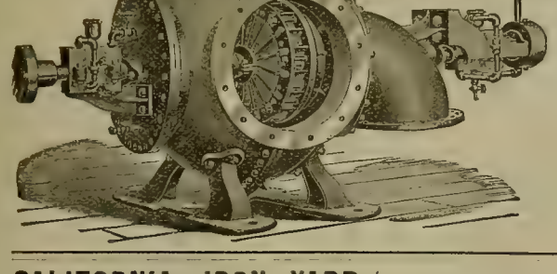
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Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

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Nevada Metallurgical Works.

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Ores worked by any Process.

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Assaying in all its Branches.

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Working Tests (practical) Made.

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BATTERY SCREENS.

Best and Cheapest in America.

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I have a large supply of Battery Screens on hand suitable for the Huntington and all Stamp Mills, which I will sell at 20 per cent discount.



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Mining Screens a specialty, from No. 1 to 15 (fine).

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Oct. 31, 1889.

The general tendency shows quite an improvement, with the feeling among merchants being of more reassuring character. The money market is easy, with remittances from the interior increasing.

The last steamer from Australia brought a little over $175,000 in coin.

The steamer City of Peking, hence Oct. 29th for Hongkong, etc., carried the following shipments of treasure:

TO HONGKONG.

Chinese, Mexican dollars	$ 87 965
Chinese, gold coin	15,177
Chinese, gold dust	130
Hongkong and Shanghai Bank, Mexican dollars..	307,000
Hongkong and Shanghai Bank (bullion)	63,000
Anglo-Californian Bank, Mexican dollars	30,000
Total	$503,272

TO SHANGHAI.

Nevada Bank (bullion)	$ 72,600

TO CALCUTTA.

Anglo-Californian Bank (bullion)	72,000
Total	$647,872

MEXICAN DOLLARS—The market continues fairly active at 76½@77 cts., with a strong tone reported at the close.

SILVER—The local market, since our last week's issue, has been quiet with buyers and sellers apart. The active and advancing market abroad is naturally having its effect on ours, and to-day it is hardly likely that purchases can be made below 96 cents. Two banks quote 95¾@96 cts., while another quotes 95¼ cts. bid. As they are all buyers, sellers can be their own judges of prices. The supply with us is very light, not sufficient to meet trade requirements, but it is claimed that this, to a certain extent, will be obviated by Mexican shipments to this city instead of, as heretofore, to New York. Yet as the latter market is advancing, being to-day 94¾ cts., the change may be only temporary. This paper has been a consistent bull on the situation, and is well pleased at present results. With Brazil resuming specie payment, the Argentine Republic arranging for resuming specie payment, and Russian securities advancing, combined with a freer call for metallic currency the world over, the situation is of the most favorable character.

QUICKSILVER—Receipts the past week aggregate 187 flasks, and the exports 352 flasks to Guaymas. The market is quiet but steady.

ANTIMONY—The market is very strong, with some asking an advance on our quotations.

BORAX—Receipts the past week aggregate 397 ctls. and exports 251 lbs. to Guaymas. The market is kept steady by the pool or trust company regulating the output by the consumptive demand.

LIME—Receipts continue to shade off, aggregating only 3170 bbls. the past week. The home consumption is falling off. Quotations are unchanged.

COKE—The past week 120 sacks were shipped to Guaymas. The agents for the Tacoma coke claim that they can do better by selling up north than sending to this market. For English coke, both spot and shipment, the market is reported firm.

TIN—The exports the past week aggregate 245,610 lbs. to Santa Rosalia. The market for both pig and plate is very strong at an advance. All the plate to arrive has been placed, while free sales have been made of spot parcels. English advices continue to report an active market, with China having taken large quantities. The feeling there is decidedly bullish.

The past week 692 ingots came to hand from Australia.

COPPER—The market, which showed a stronger tone at a slight advance, is more quiet at the close. The large consumption in Europe and at the East is a leading feature in favor of a firm market, which has been materially increased by an advance in outward freights from Chili, which precluded shipments from that country at the low prices that ruled in September.

IRON—The market for shipment has been advanced. The spot market is quiet at unchanged prices. With the usual home consumption, about all the supplies here would be absorbed and prices advanced. It now looks as if the higher markets at the East will draw to us more orders that have gone East for foundry and machine work, owing to this market now being relatively the cheapest, which, if correct, ought to favorably affect us. The English and Eastern markets are still higher.

The following are the latest comparative quotations f. o. b. at Glasgow:

	Oct. 23, '89.	Oct. 16, '89.
F. o. b. Glasgow.		
No. 1 Coltness	75s	72s 6d
" Langloan	72s 6d	72s
" Summerlee	72s 6d	70s 6d
" Gartsherrie	72s	70s 6d
At Ardrossa.		
No. 1 Eglinton	58s 6d	58s
" Glengarnock	70s	67s 6d
" Dalmellington	60s 6d	58s

COAL—Imports the past week aggregate as follows: Overland, 84 tons; Ounalaska, 47; Puget Sound, 700; Nanaimo, 3867; Seattle, 4073; Australia, 19,850; Departure Bay, 3180; Coos Bay, 1850; total, 33,621 tons. The demand while good is not quite so active as heretofore reported, but owing to the high rates of freights, importers do not see their way clear to shade prices. It is claimed that $7.75 is the asking price for just shipped or immediate shipment from Australia, while for shipment the fore part of next year more is demanded. We are informed that a vessel which left here, and will arrive in Australia next January, has a return coal cargo at 20s, which will make the coal cost here $8.25 a ton. Receipts from the coast collieries are increasing.

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Lexington, Oct. 25, $24,512; Justice, 26, $5550; Hanauer, 22, $2650; Alice, 23, $29,344; Hanauer, 23 $2600; 24, $2750; Con. California and Virginia, $18,219; Hanauer, 25, $2800; 26, $4600; 27, $2400; Mt. Diablo, 24, $6438; Eureka Con., 24, $24,000; Mt. Diablo, 28, $6601.

Eastern Metal Markets.

By Telegraph.

NEW YORK, Oct. 31, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	43¼	93⅜	$11 00	$3 80	$20 85
Friday	43½	93⅝	11 00	3 80	20 75
Saturday	43 3-16	93⅜	11 00	3 80	20 80
Monday	43½	94	11 00	3 82½	21 40
Tuesday	43 5-16	94½	11 00	3 82½	21 0
Wednesday	43½	94½	11 00	3 82½	20 90

NEW YORK, Oct. 31.—Borax continues firm at unchanged prices. Antimony is in light supply, causing previous high prices to be maintained. Copper after showing a marked degree of activity, closes dull. Lead is barely steady. Tin continues to fluctuate under European advices.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, October 31, 1889.

ANTIMONY—	19 @ 20
BORAX—Refined, in carload lots	7¼@ 7⅝
Powdered " " "	7¼@ —
Concentrated " " "	— @ 6¾
All grades jobbing at an advance.	
COPPER—	
Bolt	21 @ 22
Sheathing	22 @ 24
Ingot, jobbing	15 @ 16
do, wholesale	13 @ 14
Fire Box Sheets	22 @ 24
LEAD—Pig	4½@ —
Bar	5 @ —
Sheet	7 @ —
Pipe	6 @ —
Shot, discount 10% on 500 bags Drop, ℔ bag.	1 45 @ —
Buck, ℔ bag	1 65 @ —
Chilled, do	1 85 @ —
STEEL—English, lb	16 @ 20
Canton tool	9 @ 9½
Black Diamond tool	9 @ 9½
Pick and Hammer	8 @ 10
Machinery	4 @ 5
Toe Calk	4½@ —
TINPLATE—B. V., steel grade, 14x20, P. S	5 25 @ 5 37½
B. V., steel grade, 14x20, spot	5 00 @ —
Charcoal, 14x20	6 75 @ 7 00
do roofing, 14x20	5 50 @ —
do, do, 20x28	11 00 @ —
Pig tin, spot, ℔ lb	21½@ 22½
COKE—Eng., ton, spot, in blk & sks, resptvly	17 00 @ 20 00
Do, do, to load	13 50 @ 14 50
QUICKSILVER—By the flask	— @ 47 50
Flasks, new	@ —
Flasks, old	35 @
CHROME IRON ORE, ℔ ton	10 00@ —

IRON—	Spot.	To Load.
Glengarnock ton	31 00 @ — —	29 @ —
Eglinton, ton	29 00 @ — —	28 @ —
American Soft, No. 1, ton —	@31 00	31½@ —
Oregon Pig, ton	— — @30 00	— @ —
Clay Lane White	— — @ 28 00	26 @ —
Shotts, No. 1	31 00 @ 31 00	— @ —
Bar Iron (base price) ℔ lb	2½@ 3	— @ —
Langloan	31 00 @ — —	30 @ —
Thorncliffe	31 00 @ — —	30 @ —
Gartsherrie	31 00 @ — —	30 @ —

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$20 00	$17 00
41 to 50 ft	21 00	18 00
51 to 60 ft	23 00	20 00
61 to 70 ft	27 00	21 00
1x3, fencing	22 00	19 00
1x4, "	21 00	18 00
1x3, 1x4 and 1x6, odd lengths	19 00	16 00
Second quality	17 00	15 00
Selected	24 00	22 00
Clear, except for flooring	31 00	28 00
Clear for flooring	2 00	.....
Clear V. G. No. 1 flooring	6 00	.....
Firewood	14 00	10 00
Dressed Pine, flooring, No. 1, 1x6	32 00	29 00
No. 1, 1x4	34 00	30 00
No. 1, 1¼x4, 1¼x6, and odd sizes	37 00	33 00
All sizes, No. 2	27 00	24 00
Stepping, No. 1	44 00	35 00
Stepping, No. 2	34 00	25 00
Ship timber and plank, rough	27 00	18 00
Selected, planed 1 side, av'ge 40 ft	29 00	24 00
" " 2 " " "	31 00	26 00
" " 3 " " "	33 00	28 00
" " 4 " " "	35 00	30 00
Deck plank, rough, average 35 ft	35 00	32 00
Dressed, average 35 feet	40 00	35 50
Pickets, rough, B. M	20 00	16 00
1x1½, 4 ft long, ℔ M	6 50	5 00

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	7 75 @ 8 00	Cardiff	9 50@10 00
Liverpool St'm	8 50 @— —	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	9 00 @ 9 00	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Gilman	7 00
Scotch Splint	9 00	Seattle	7 00
Greta	9 00	Coos Bay	6 00
Westminster Brymbo	9 00	Cannel	11 00
Nanaimo	9 00	Egg, hard	18 00
Sydney	8 0	Cumberland, in sacks	19 00
Jackson	6 00	do, bulk	18 00

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, department 10, San Francisco:

SATA CRUZ BITUMINOUS ROCK CO., Oct. 28. Capital stock, $100,000. Directors—George M. Perine, John F. Farley, C. F. Dunne, J. J. Dunne and R. S. Fallon.

BUTTE COUNTY RAILWAY CO., Oct. 30. Object, to construct standardard-gauge railroad from the depot of the Northern California Railroad Company, in Oroville, through designated street to the Chico and Oroville road and to the town of Thermalito, together with a branch road from the junction of Meyer and Montgomery streets, Oroville, running along Montgomery street and the Marysville road in a southwesterly direction. Directors—J. A. Baxter, J. W. Hartzell, J. A. Mullen, Charles H. Forbes and R. T. Harding. Capital stock, $40,000.

PACIFIC OCEAN BATH CO., Oct. 30. Object, to establish salt-water baths in this city, the water to be conducted from the Pacific ocean. Capital stock, $100,000. Directors—L. L. Baker, G. W. Gramm, J. R. Spring, J. D. Sullivan and Joseph D. Redding.

HEMME & LONG PIANO CO., Oct. 30. Capital stock, $200.000. Directors—Erastus Caswell John, B. Curtiss, E. J. Bebre, John A. Stewart and H. A. Stewart,

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINES
Belcher M Co	Nevada	13	50	Oct 17	Nov 20	Dec 11	John Crockett	327 Pine St
Best & Belcher M Co	Nevada	44	25	Sept 11	Nov 14	Dec 6	L Osborn	309 Montgomery St
Central California Oil Co	California	1	50	Sept 6	Nov 1	Nov 18	F L Garlinski	314 Usaifornia St
Cadmus M Co	Nevada	—	50	Sept 19	Oct 31	Nov 25	J Craig	204 California St
California State Co	California	5	25	Oct 21	Nov 26	Dec 23	J O Hanscom	9 Mission St
Chicago M & M Co	California	2	15	Sept 13	Oct 18	Nov 4	W Grant	520 Montgomery St
Crown Point M Co	Nevada	52	50	Sept 18	Oct 21	Nov 11	J Newlands	329 Pine St
Del Monte M Co	Nevada	2	20	Oct 28	Dec 2	Dec 26	J W Pew	310 Pine St
Grand Prize M Co	Nevada	22	30	Sept 24	Oct 28	Nov 19	R F Bigelow	327 Pine St
Golden Jacket M Co	Nevada	3	10	Oct 14	Nov 21	Dec 20	R G McClellan	331 Montgomery St
Golden Prize Con M Co	Nevada	3	25	Sept 21	Oct 26	Nov 16	C D Bennett	330 Pine St
Gould & Curry M Co	Nevada	63	30	Oct 15	Nov 18	Dec 11	A Durbrow	399 Montgomery St
Gray Eagle M Co	California	15	6	Oct 16	Nov 18	Dec 10	J M Buffington	303 California St
Livermore Coal M Co	California	1	50	Sept 18	Oct 19	Nov 6	G U Higgins	120 Sutter St
Locomotive M Co	Arizona	5	5	Oct 19	Nov 25	Dec 17	A H Fish	309 Montgomery St
Lapanta Con M Co	Nevada	2	02	Oct 2	Nov 3	Dec 2	J Stadfeldt	309 Montgomery St
Mexican M Co	Alaska	1	25	Oct 11	Nov 11	Dec 2		
North Belle Isle M Co	Nevada	16	20	Sept 18	Oct 22	Nov 13	J W Pew	310 Pine St
North Bonanza M Co	Nevada	9	10	Sept 17	Oct 26	Nov 14	J F Bolling	410 Montgomery St
Navajo Queen M Co	Nevada	2	10	Oct 23	Nov 26	Dec 11	J F Bolling	533 Kearny St
Oak Con M Co	California	4	7	Sept 5	Oct 19	Nov 20	E J Ryan	230 Montgomery St
Peer M Co	Arizona	8	10	Sept 4	O t 10	Nov 5	A Waterman	309 Montgomery St
Potosi M Co	Nevada	33	50	Sept 18	Oct 22	Nov 12	C E Elliott	309 Montgomery St
Plath & Gil on G M Co	California	3	4 00	Sept 11	Oct 15	Nov 4	C Herrmann	326 Kearney St
Phil Sheridan Con M Co	Nevada	4	10	Oct 22	Nov 26	Dec 11	J F Bolling	533 Kearny St
Peerless M Co	Arizona	13	10	Oct 11	Nov 19	Dec 10	A Waterman	309 Montgomery St
Silver Hill M Co	Nevada	25	20	Sept 27	Oct 31	Nov 21	D C Bates	309 Montgomery St
Sierra Nevada	Nevada	96	5	Oct 5	Nov 3	Dec 7	E L Parker	309 Montgomery St
Seg Belcher & Mides Co	Nevada	4	25	Oct 7	Nov 4	Dec 8	E A Holmes	309 Montgomery St
Tuscarora Con M Co	Nevada	2	10	Oct 12	Nov 15	Dec 6	J Scoville	309 Montgomery St
Trogan M Co	Nevada	18	10	Oct 23	Nov 26	Dec 11	J F Holling	533 Kearny St
True Con M Co	California	7	2½	Aug 31	Oct 12	Nov 16	J C Bates	434 California St
Utah Con M Co	Nevada	8	25	Oct 23	Nov 26	Dec 16	A H Fish	309 Montgomery St
Union Con M Co	Nevada	39	25	Oct 8	Nov 9	Dec 13	J M Buffington	303 California St
Vine Spring M Co	California	1	15	Oct 10	Nov 11	Dec 9	F S Snell	218 Sacramento St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F	MEETING	DATE
Occidental Con M Co	Nevada	A K Durbrow	309 Montgomery St	Annual	Nov 4
Great Western Quicksilver M Co	Cal	A Halsey	323 Montgomery St	Annual	Nov 5
Confidence S M Co	Nevada	A S Groth	414 California St	Annual	Nov 8
Mineral King M & M Co		P H Leonard	4 9 California St	Annual	Nov 4
California Slate Co	California	J O Hanscom	9 Mission St	Special	Nov 25

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	AMOUNT.	PAYABLE
Champion M Co		T Wetzel	522 Montgomery St	10	Oct 15
Caledonia M Co	Nevada	A S Cheminant	328 Montgomery St	08	Aug 6
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	Sept 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	Aug 25
Idaho M Co	California		Grass Valley	5 00	Oct 7
Mt. Diablo M Co	Nevada	R Heath	319 Pine St	30	Oct 21
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Sept 10

Mining Share Market.

The market has been active throughout the past week, with lively and attractive fluctuations in the Comstock shares. The advance in prices has caused many if not all the smaller shorts to fill, but the larger shorts do not appear disconcerted at the slightly higher prices. The move appears to have been manipulated on water in the Carson river, and the strong probability of all the mills starting up within the next ten days. In the upward move the manipulators were assisted by the bulls who unduly exaggerate everything in their favor. They express more confidence by reason of the mills starting up; several more mines preparing to take out ore for crushing; a reduction of one dollar a ton in the cost of milling and a belief that outside dealers will come in the market as prices advance. The large bears, those well informed on the market, are confident that whatever the move is, it will be of short duration and be followed by lower prices than since last August. They also claim that while the idle mills will start up on ore, outside holders of stock will, as usual, derive no benefit—only get assessments while insiders get the bullion—and therefore it is only a question of a short time until outsiders let go of their stock at depreciating prices. They further claim that much of the work as now outlined will take time and money to make any new development in any of the mines, for no decided upward move, they claim, can be made without a new discovery of ore. Outside stocks have been stagnant at easier prices, owing to more assessments to come on soon, and the fear that as they did not move up with the Comstocks, that when the latter set back they will do likewise. From the mines our information reports that the Nevada Mill will soon start up with forty stamps on Chollar ore; some of the idle stamps of the Brunswick Mill are to run on Confidence ore; the Eureka Mill is running to full capacity on Con Virginia ore, which together with the ore crushed by the California Pan Mill, will admit of regular dividends in the future. The Vivian Mill is running on Overman ore. The Mexican Mill is to start up on Hale and Norcross ore. Crushing of ore from the Savage and Potosi mines is to be commenced at an early day, as also ore from Crown Point and probably Belcher. The usual spread eagle reports are to hand from the Alta mine. The Occidental and Yellow Jacket Mining Companies are accumulating money in their treasury. About two months ago we reported that in the Alpha west crosscut on the 500-foot level a ledge about eight feet wide was run into; this was generally denied, but it is now confirmed by the superintendent's annual report which gives the ledge ten feet wide, with the ore assaying from $20 to $30 a ton. This is the more important from the fact that it is the same west ledge cut in the Belcher mine and from which Confidence Challenge and Con Imperial are now running, and which they should cut soon. The work now going on in Best and Belcher on the 1000-foot level deserves careful watching from the fact they are running for an important ore ledge on that level. From the Quijotoas, Tuscaroras and Bodies, more prospecting work is under way. This week's official letter from Bodie reports the upraise from the 1000-foot level and the upraise from the 900-foot level being "driven" ahead by that well-known "driver," Captain John Kelley. The usual favorable news comes to hand from the Eureka and also from the Mt. Diablo.

The market for the Comstock shares opened this (Thursday) morning top-heavy under outside selling. After the regular call the north-end shares shaded off under bear points, and confirmed reports that Col. John W. Mackay had left New York for Europe. With strong buying orders, the market soon rallied, sending prices higher than they were on Call. It now looks as if the pool has some stocks they wish to dispose of, and if the public will not take them at the present prices, the market will be advanced until outsiders relieve them of their surplus holdings. Official letters received to-day from the Gold Hill mines are of a more encouraging character, particularly from Crown Point, where good milling ore is found. The Alta pumps are started to pump out that and the Gold Hill group of mines.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 10.		WEEK ENDING Oct. 17.		WEEK ENDING Oct. 24.		WEEK ENDING Oct. 31.	
Alpha	1.20	1.30	1.05	1.25	1.00	1.15	1.25	1.50
Alta	2.20	2.25	1.85	2.30	2.00	2.30	2.05	2.40
Andes	....	....	.60	....	.65	.60	.65	.75
Belcher	2.50	2.70	2.25	2.60	2.00	2.30	2.30	2.80
Best & Belcher	3.20	3.40	3.05	3.35	2.80	3.10	2.95	3.95
Bullion	.55	.55	.50	.60	.50	.55	.55	.75
Bodie Con	.70	.85	.65	.80	....	....	.75	.85
Benton	....	....	3.25	....	....	....	....	....
Bulwer	.30	.30	.25	....	.15	.30	.25	....
Commonwealth	3 05	3.30	2 95	3 20	2.95	3.00	2.80	3.05
Con. Va. & Cal	6	6⅝	5¼	6¼	5⅛	5.50	5⅛	6⅜
Challenge	2.75	2.85	2.25	2.65	1.90	2.10	2.10	2.50
Chollar	1.55	1.75	1.55	1.70	1.45	1.65	1.50	2.10
Confidence	6⅛	6⅝	5.25	6.75	6.00	....	....	7
Con. Imperial	.40	.45	.35	.45	.30	.35	.35	.45
Caledonia	.20	....	....	....	....	....	.20	....
Crown Point	2.25	2.55	2 05	2.20	2 00	2.50	2.55	3.15
Crocker	.50	.55	.40	.50	.45	....	.40	....
Eureka Con	3.20	5.50	3.20	4.60	3.60	4.50	4.10	4.25
Exchequer	.50	.55	.50	.55	.50	....	.55	.70
Grand Prize	.50	.65	.55	.70	.55	.60	.50	.90
Gould & Curry	1.90	2.05	1.55	1.90	1.35	1.55	1.50	2.00
Hale & Norcross	2.75	3.05	2.75	3.00	2.75	2.95	2.90	3.35
Julia	....	....	.20	....	.20	....	....	....
Justice	1.55	1.70	1.35	1.55	1.40	1.50	1.45	2.00
Kentuck	1.15	....	1.15	1.15	1.00	....	1.00	1.20
Lady Wash	.40	....	....	....	.35	....	.40	....
Mono	.75	.80	.60	.70	.40	.55	.60	.65
Mexican	3.60	4.00	3.40	3.80	3.10	3.60	3.30	4 40
Navajo	.35	.40	.30	....	.35	....	....	....
North Belle Isle	.75	.80	.75	.75	.90	.85	....	.90
Nev. Queen	.65	.85	.60	.75	.60	....	.55	.70
Occidental	1.40	1.45	1.10	1.30	1.00	1.15	1.10	1.40
Ophir	4.50	4 80	4.05	4.55	3.70	4.20	4.00	5.00
Overman	1.05	1.15	.90	1.05	.80	.95	.90	1.10
Potosi	1.25	1.35	1.10	1.25	1.05	1.60	1.50	2.10
Peerless	.30	.35	.25	.30	.20	....	.25	....
Peer	.10	.20	....	....	....	....	....	....
Savage	1.75	2.05	1.55	1.75	1.60	1.70	1.50	2.10
Sierra Nevada	1.35	1.60	1.15	1.40	1.05	1.15	1.25	1 55
Silver Hill	2.20	2.60	....	....	1.55	1.90	1.60	2.15
Scorpion	.25	....	.15	.20	.15	.20	.15	.60
Union Con	.20	....	.25	....	.20	....	.20	.25
Utah	2.95	3.10	2.80	3.00	2.60	2.85	2.75	3.25
Weldon	.90	.95	.85	.90	.65	.85	.70	.90
Yellow Jacket	....	....	....	....	....	....	....	....
	3.05	3.25	2.90	3.15	2.75	2.95	2.75	3.40

Sales at San Francisco Stock Exchange.

THURSDAY, Oct. 31, 9:30 A. M.

1300	Alta	2.25	
500	Alpha	1.50	
300	Belcher	2.70	
450	B. & Belcher	3 35	
400	Bullion	.70c	
100	Bulwer	.25c	
50	Caledonia	.30c	
100	Challenge	2.55	
650	Chollar	2.10	
100	Commonwealth	3.00	
200	Crown Point	2 95	
600	Con. Imperial	.40c	
200	Con Va & Cal	6.87½	
250	E. S. Nevada	.10c	
750	Exchequer	.70c	
600	Gould & Curry	1.85	
400	Hale & Nor	3.20	
50	Iowa	.25c	
500	Justice	2.00	
150	Kentuck	1.15	
570	Mexican	4.20	
700	New York	.40c	
100	N. Belle Is	.90c	
50	N. Commonwealth	.95c	
50	Occident	1.40	
800	Ophir	4.95	
200	Overman	1.05	
100	Peer	.2 c	
100	Peerless	.30c	
650	Potosi	2.05	
340	Savage	2.00	
250	S. B. & M	1.40	
785	Sierra Nevada	2.20	
1150	Silver Hill	.60c	
200	Union	.90c	
600	Union	3.15	
150	W Comstock	.30c	
50	Yellow Jacket	3.25	

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Assessment Notices.

Lapanta Consolidated Mining Company.

Location of principal place of business, San Francisco, California. Location of Works, Hawthorne Mg. Dist., Esmeralda Co., Nevada.

NOTICE is hereby given that, at a meeting of the Board of Directors, held on the 2d day of October, 1889, an Assessment, No. 2, of Two Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin, to the Secretary, at the office of the Company, Room 56, Nevada Block, No 309 Montgomery Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 6th day of November, 1889, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the 24 day of December, 1889, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

J. STADTFELD, JR., Secretary.

Office, Room 56, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

Gray Eagle Mining Company, Location

and principal place of business, San Francisco, California. Location of Works, Placer Co., Cal.

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 16th day of October, 1889, an Assessment, No. 15, of Six (6) Cents per share was levied upon the Capital Stock of the Corporation, payable immediately, in United States Gold Coin, to the Secretary, at the office of the Company, Room 11, No. 303 California St., San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 18th day of November, 1889, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Tuesday, the 10th day of December, 1889, to pay the delinquent assessment, together with the cost of advertising and expenses of sale.

By order of the Board of Directors.

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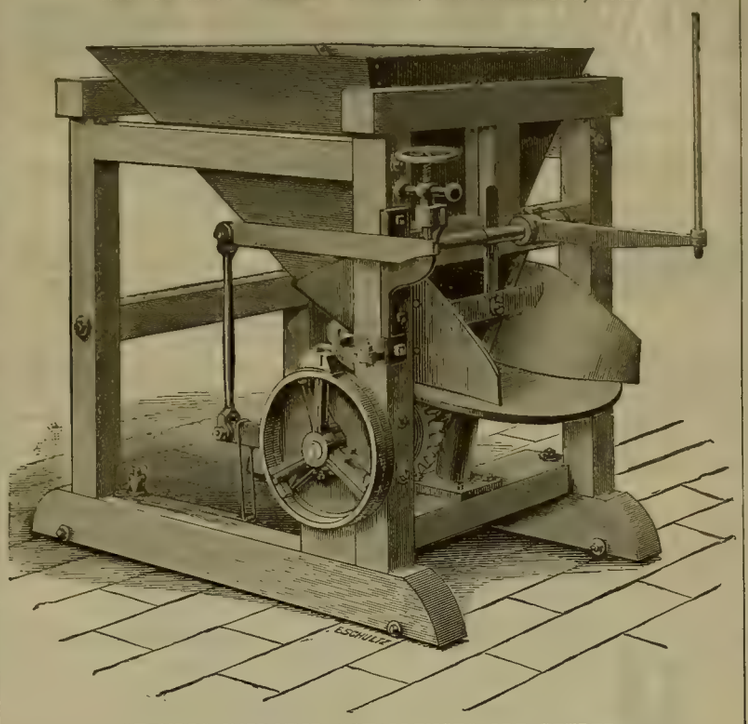
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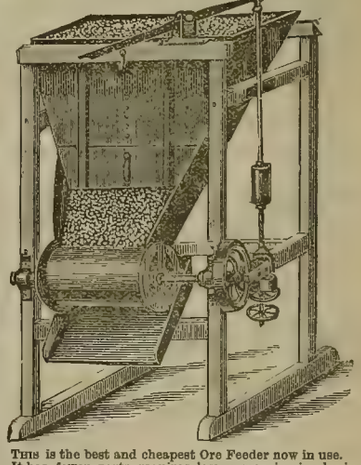
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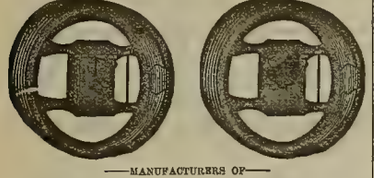
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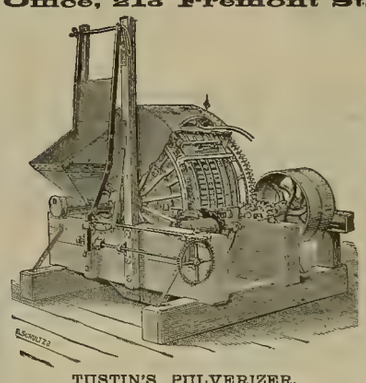
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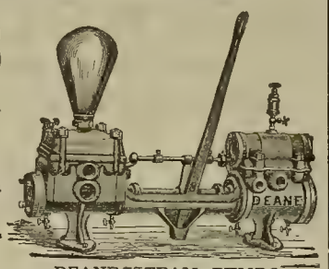
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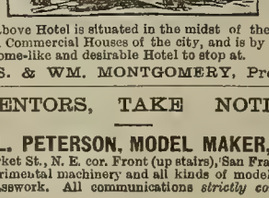
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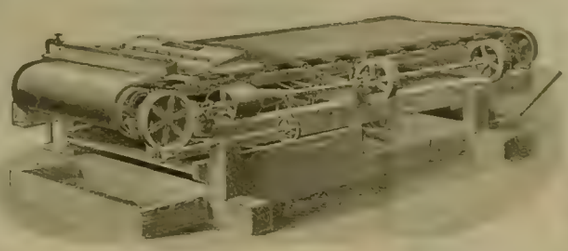
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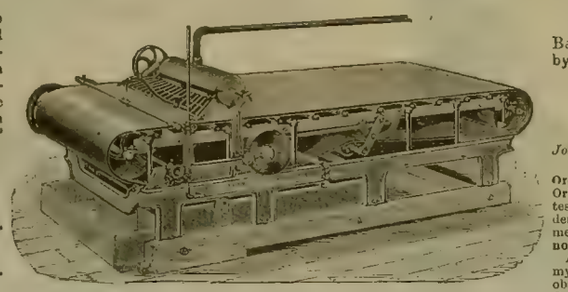
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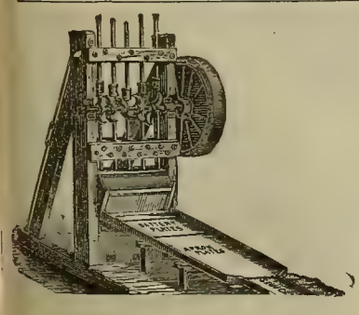
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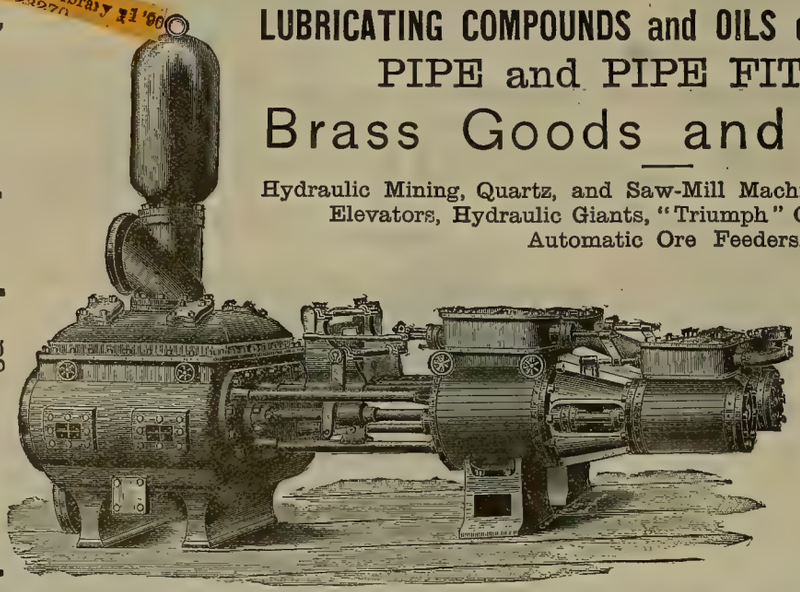
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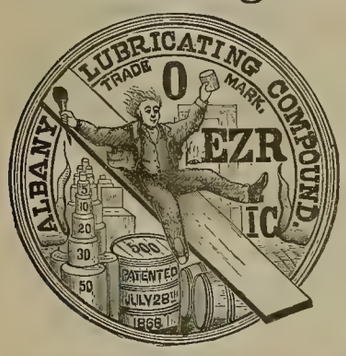
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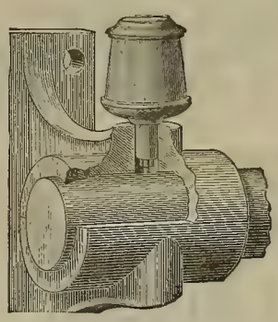
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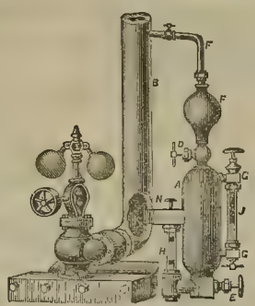




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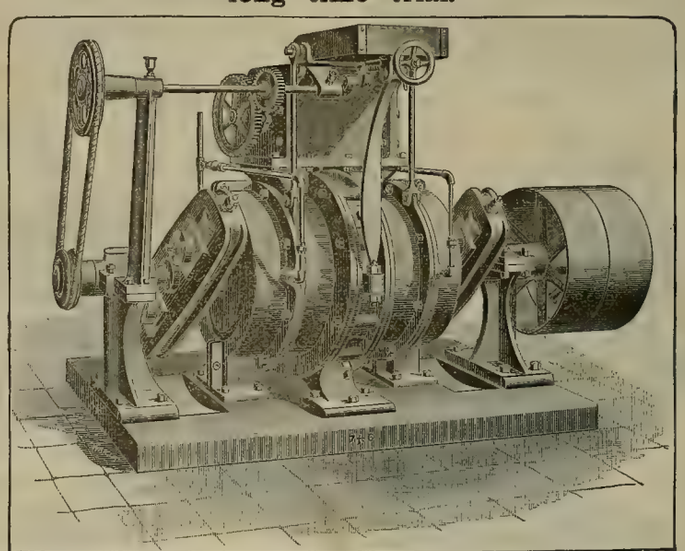
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Grading Machine for Handling Earth.

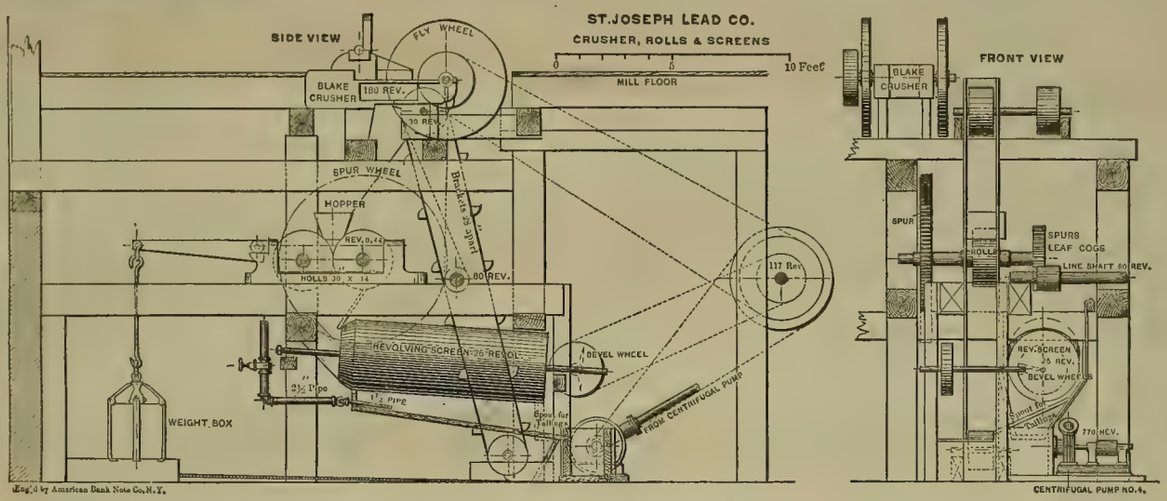
Among the great industries of the country the irrigation of the arid region is now commanding a full share of public attention. Nearly all of the United States west of the 100th meridian may be classified as desert lands, and this includes more than two-fifths the entire area, if we exclude Alaska. These lands are of high fertility, but lacking water are comparatively worthless.

Major J. W. Powell, Director of the United States Geological Survey, estimates that there are from 90,000,000 to 100,000,000 acres of these lands for which a water supply can be obtained. More than $100,000,000 have already been invested. The smaller canals are being constructed by farmers themselves, and the larger ones in some cases by companies employing labor directly and others are under contract.

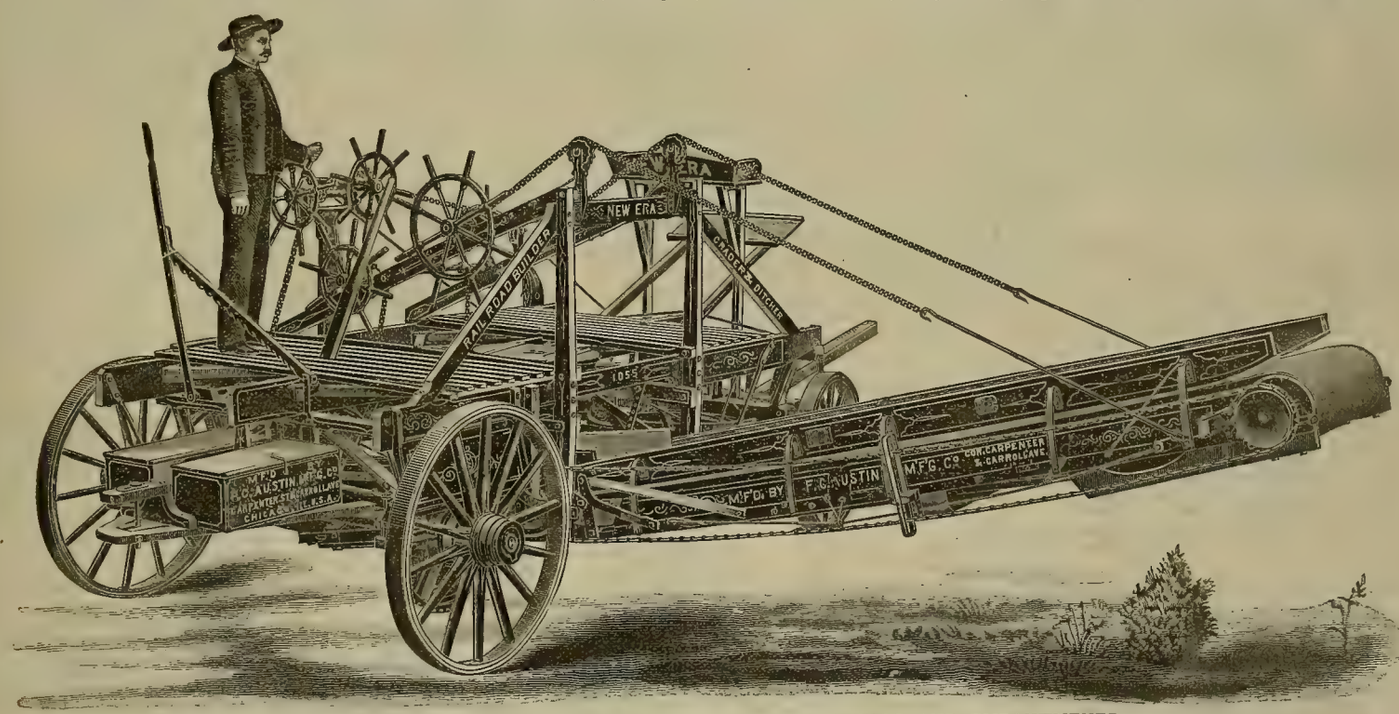
It is being demonstrated by the successful use in a number of places of the grading-machines herewith illustrated, that the cost of construction can be reduced nearly, if not quite, one-half. These machines have been employed for the past twenty years for building country roads, upon railway embankments, for loading wagons, and, in fact, wherever large amounts of earth are to be handled.

There are hundreds of them in use, from one end of the country to the other. There are 30 of them in the city of Omaha alone, where, owing to a strike several years ago, a number of them were put to work by contractors in grading down streets and lots, and loading wagons. They have superseded the old methods entirely, and are gradually being adopted by all successful earth-handling contractors.

As before stated, they are peculiarly adapted to the construction of irrigating canals, which usually follow the line of grade with an average cut of from one foot to four feet deep. The illustration herewith gives a clear idea of the work as done by these machines. A plow upon one side of the grader throws a furrow 12 inches wide and 6 or 8 inches deep upon an elevating belt, driven by the rear wheels, which deposits it at the pleasure of the operator from 10 to 22 feet away, in a solid continuous embankment. Each machine is capable of excavating and placing in an embankment from 1000 to 1500 cubic yards of earth in ten hours, or of loading 600 to 800 wagons in the same time. The F. C. Austin M'f'g Co., Chicago, Ill., makers of the "New Era," also manufacture the "Austin Reversible Road Grader," and a full line of prospecting and well-boring machinery.



ARRANGEMENT OF CRUSHER ROLLS AND SCREENS AT ST. JOSEPH LEAD COMPANY'S WORKS.—See page 382.



GRADING MACHINE FOR BUILDING ROADS, DITCHES, CANALS AND EMBANKMENTS.

THE mining assessments falling due in November amount to $299,400, of which sum the Nevada mines take $249,400; California, $10,000; Arizona, $15,000, and Alaska, $25,000.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Tuolumne River Group of Mines.

EDITORS PRESS:—This property is situated on the south bank of the Tuolumne river, about seven miles from Groveland and 14 miles from Sonora. It consists of 12 mining claims. The Mary Ellen mine, on which most of the developments and expenditures have been made, was discovered in 1856. A 20-stamp mill was built and operated, but financial difficulties arose, in a measure caused by the non-amalgamation of the gold; although the rock yielded high assays and showed freely the precious metal, the then crude methods of milling and reduction failed to obtain payable results. The coated, fractious metal proved a serious obstacle in those days of primitive knowledge of gold-saving. The mine was abandoned, but not before the flumes and mill were destroyed and carried away by the rapid rising of the Tuolumne river. The present owner, Mr. A. B. Cruikshank, took hold of this particular portion of the property, opened it up in a systematic and practical manner by drifting the upper tunnel, there discovering a fine lode from five to six feet in size, which now pays in the present mill $33 73 per ton. Mr. Cruikshank has built a first-class ten-stamp mill, with Challenge ore feeders, concentrators, etc., and will add thereto in the near future Frue concentrators and an improved Blake rock-breaker. This proves indisputably that so far the owner is sufficiently well pleased with the outlook of his mines to warrant the outlay and expenditures made and contemplated.

Developments lower down the mountain-side are being performed by tunnels being entered to tap the chutes at greater depths. A compressor will be placed and run by water-power to drive the drills in the mine, so as to expedite the advancement of the work of exploration. I may state that all the improvements, both in and around mill and mine, have been carried out and constructed in a most thorough, substantial and permanent manner. From the general aspect and well-known auriferous character of this belt, the perfect formation, large size of the lodes, the rich gold-bearing quartz, the high grade of the sulphurets, and the now nearly perfect method and appliances for gold-saving, this group of mines must soon take a prominent place among the leading gold-producers of the State. ARGUS.

THE ELECTRIC MILL PLANT.—H. S. Conner, one of the expert electricians in the employ of the Brush Electric Light Company, sent here from Cleveland, Ohio, to overhaul the electric plant at the Nevada mill, has been testing the dynamos on the Sutro tunnel level of the Chollar incline the past month, operating them with a pony-brake of 65-horse power, and reports the entire plant in perfect order to transmit auxiliary power for operating the mill when it resumes crushing ore next Saturday. Mr. Conner is confident that he has remedied the defects in the system and predicts that the plant will operate as smoothly as clockwork when the mill is started. He has introduced cards of instruction to employes in the underground dynamo chamber and surface motor room, and hereafter every flash will be noted in both places. A flash indicates carelessness on the part of operators, and Mr. Conner attributes the failure of the system to give satisfaction heretofore principally to that cause.—*Virginia Chronicle.*

SUGAR QUARTZ.—A San Francisco mining expert was inquiring the other day what was meant by "sugar quartz." An Alamo miner explained to him as follows: "You fellows don't understand the lay of the country here. It is to a great extent new to us all, and we have to invent names to suit what we find. We call it 'sugar' because it looks like sugar and is sweet to the heart of the miner. When we get through prospecting, some of these ledges will have to be described by saying we 'found some maple sugar float on the surface.' The ledge started down with a coffee footwall, a bacon hanging-wall and a sugar gouge which averaged about a barrel of sugar to the ton. At a depth of a quarter of a mile it was cut in twain by a hard-tack dike, which, after breaking several drills, disclosed half a ton of yellow gumdrops set in crystallized ice."—*Alamo Nugget.*

FRANCIS BYRNE has gone to New York to push ahead the organization of the Grass Valley Syndicate Tunnel Company, which has been formed to carry out the plans projected by the Gold Tunnel Company for running an eight-mile tunnel from the South Yuba river through the quartz-mining belt of Nevada City and Grass Valley, the new company starting 3650 feet farther down the river than the site near the Hoyt Crossing which was formerly selected. Estimates have been obtained for the cost of the plant necessary for completing five miles of the tunnel, and the figure is $93,000. This plant includes steel rails, water and air-pipes, two air-compressors, air drills, cars, compressed air locomotives with a capacity of hauling ten cars each, etc. Mr. Byrne says now the tunnel is certain to be constructed and that active operations on it will begin before next spring.

The Eucalyptus in Southern California.

[The following has just been issued as bulletin 6 of the California State Board of Trade of Forestry.]

The plantations at the Santa Monica Station, from which the concurrent notes were made, are growing upon a steep hillside, having a direct eastern exposure.

The "pitch" is sharp enough to form an angle of 45 degrees to 50 degrees, with the plane of the valley beneath, through which runs a small rivulet; the whole plantation, by its location, is protected from strong winds, and is distant from the seacoast about one-half mile.

The soil, which is typical of many hillsides in Southern California (and of which analyses are herewith appended), is of two characters; one a grayish, clay-like material, thinly overlaid with three to 15 inches of broken shale, some loam and a little humus, washed down from a higher plateau or mesa; the other, a reddish mass, bearing a large amount (nearly one-fifth) of decomposed iron, and is entirely bare and denuded of any superincumbent covering whatsoever.

For convenience of future reference, we will designate the former of these as tract A—the latter, tract B.

The area of both is about the same; tract A was planted January 5th, tract B on January 11th, of the present year. Neither received any plowing or cultivation of the soil whatsoever.*

Neither has received any water from any source since planting, except rainfall, of which the latest, and then a fair precipitation, occurred March 16th.

Growth made between the dates of planting and this rainfall was too inconsiderable for measurement; and at the time of planting, the trees measured 10 to 15 inches in hight. *Practically*, all the growth noted has occurred between March 16th and July 31st—a period of four and one-half months. The lowest temperature recorded during this time was on February 18th, when the themometer registered one degree below zero (30 degrees F.). None of these species seem to have suffered from this exposure, although it should be stated that no long-continued, low temperatures occurred, 1.10 (about 34 degrees F.) being the coldest weather enduring longer, or more continuously, than one night. In many instances, such exceptionally good results have followed; and some of the measurements obtained were so phenomenal that I feel constrained to record the details above set forth in order that due consideration may be given to the possible benefits arising from the greater or less atmospheric humidity incident to the contiguity of the streamlet and the ocean—the favoring temperature, and kindly shelter of the hills from strong winds.

Not only do the analyses show it, but Prof. Hilgard, who has kindly interested himself in the matter, assures me that these soils are not any way deficient in the elemental requisites to successful tree growth. Still the complete failure of some species, and pronounced success of others under identical external conditions and adverse ones at that, seems to indicate that where it is not practical to furnish cultivation or irrigation, that by conforming our plantations of forest trees to meet the controlling chemical characters of the soil for which certain species may show assimilative traits; that as happy results may ensue as where we can furnish those artificial stimulants to tree growth considered of such vital import to plant life in a dry climate.

The statement of the principle involved, i. e., that plants thrive best where furnished with congenial food, is a bald truism known to every cultivator of the soil, who, if successful, endeavors to fulfill those very conditions in the growing of general or special crops; yet I am unaware that in forest-growing its value has ever been suggested, or if so, the suggestion utilized to take practical advantage of conditions as we find them, and without reference to supplying those deficient elements of fertility, either organic or mechanical, essential to general agriculture, and which, applied to forest plantations upon rough and precipitous hillsides, would be expensive, inexpedient, almost impracticable, and probably unremunerative.

Analyses of the soils in question are as follows:

	Tract A.	Tract B.
Insoluble matter	49 948	48 570
Soluble silica	20.730	8 245
Potash (K_2O)	1 093	1 537
Soda (Na_2O)	658	.853
Lime (CaO)	3 227	8 143
Magnesia (MgO)	2 855	2 450
Br. ox. manganese (Mn_2O_4)	048	.020
Peroxide of iron (Fe_2O_3)	8 109	18.193
Alumina (Al_2O_3)	6 774	1.509
Phosphoric acid (P_2O_5)	228	.280
Sulphuric acid (SO_3)	2 648	733
Carbonic acid (CO_2)	....	3 180
Water and organic matter	3 597	6 376
Totals	99.913	100.89

Broadly classified, the soil of *A* is rich in lime in the form of sulphate (gypsum), with a larger amount of readily soluble salts than that of *B;* and as compared with the latter, about evenly supplied with potash and phosphates. *B*, strongly ferruginous, with less of plastic clay than *A* and its abundant lime in the form of chalk (carbonate).

Digging upon both tracts, July 31st, at depths of 15 to 30 inches, failed to reveal any moisture readily appreciable to touch or sight. Measurements of and notes of growth of different species upon that date, are herewith given. Hights are expressed in feet and inches, and "average" obtained by measurements "as they ran"—not the mean of the extremes of best and poorest specimens.

NAMES.	Tract A. Best.	Tract A. Average.	Tract B. Best.	Tract B. Average.	Remarks.
1. Eucalyptus polyanthema (Many-flowered Gum)	9.6	7	4.2	3.6	Growth in B., small but thrifty.
2. Eucalyptus globulus (Tasmania Blue Gum)	4.6	4	....	....	None planted in B.
3. Eucalyptus cornuta	7	6	4.6	4	Sent out last year as the "Tooart Gum" remarkably thrifty in both plantations.
4. Eucalyptus obliqua (Stringy Bark or Messmate)	6	5.6	2	0	Moribund in B. Lacks good color in A.
5. Eucalyptus leucoxylon (Victorian Iron Bark)	5	4.6	5.6	4.6	Richer, better color in the iron soil.
6. Eucalyptus rostrata (Red Gum)	....	....	5.6	5	Not planted in A.
7. Eucalyptus coryanocalyx (Sugar Gum)	6	5.6	....	....	Not planted in B.
8. Eucalyptus viminalis (Manna Gum)	6.6	5.8	4.6	4.6	"Off" color in B.
9. Eucalyptus stuartiana (Apple-scented Gum)	6.6	4.6	....	....	Not planted in B.
10 Acacia mollissima (Soft Leaf Wattle)	6	5	....	....	Not planted in B.
11. Acacia pycnantha (Golden Wattle)	3.6	3	3	2.6	Strongly vigorous in both.
12. Acacia melanoxylon (Blackwood)	2	0	0	0	Sickly in A. Dead in B.

From this tabulation will be noticed:

1. That the common Tasmanian Blue Gum, widely recognized as the typical exponent of all that is rapid among forest trees, has (under like conditions) been exceeded by all other species.

2. The general inferiority of all species upon *B* (as compared with *A*), with the single exception of the Victorian Iron Bark.

3. The remarkable growth of the many-flowered gum in *A*, and its *apparent* preference for the gypsum form of lime rather than the chalk and excessive iron-charged soil of *B*.

4. The complete adaptability of the iron bark to the latter.

5. The utter failure of the stringy bark upon *B*. In this instance, the stringy bark, it is not wise to formulate any hasty conclusions, implying want of water or proper nutrition. It is one of the few species making a distinctive tap-root and elaborating few superficial rootlets.

Both of these soils are, in their uncultivated states, strongly impermeable to even water, and the fair success of the same upon *A* may be due to the slender "top dressing" thereon, and that so soon as its tap-root reaches the densely impacted underlying soil, it may succumb as completely as it has upon *B*. Despite good growth upon *A*, it seems to show, in deficient leaf coloring, already an early expenditure of stamina and vitality. Whatever be the cause, its failure is the more regrettable, as in view of recent tests of the wood of this species made by Mr. Allen Ransome at Chelsea, England. His report* accredits it with the highest value for great strength, toughness and durability—characters not ascribed to it by previous authors, and, according to Von Mueller, it "quickly yields an immense bulk of wood on the very poorest soils."

Its adaptability to the poorest soils of California, I think, must obviously be sought upon lands of more porous nature, and hope to continue further experimentation to this end.

All the acacias develop an extensive tap-root, and we are measurably compensated for the failure of the Blackwood by the good showing made by the Golden Wattle. It seems to have found congenial organic conditions that counterbalance the bad physical situation that the Blackwood could not overcome. While the latter makes one of the most serviceable shade trees we know of, the former must come into more general use for forest planting, on account of its pronounced economic value.

To promote an interest in forest growing upon waste lands, where the risks and drawbacks are so considerable, where the initial cost is great, where neither water nor cultivation is available, vermin destructive and inroads from stock, mountain fires, and other perils imminent, and where final benefits are long delayed; demands that, though we may not assure the planter of any royal road to success, we can, at least, contribute our quota to minimizing these risks.

None recognize more forcibly than the writer the danger of formulating conclusions from results obtained within circumscribed areas and extending over so brief a time, yet making due allowance for the value of all climatic appurtenants, I am of opinion that a more careful study of soils and species adapted to them will measurably neutralize these evils.

Not alone do the results here tabulated justify this view, but it is emphasized by noting the unparalleled vigor with which the native evergreen shrubbery grows upon the most arid, forbidding and inaccessible of our California mountains. Beneath the fiercest of August suns, among naked bowlders, and upon almost vertical acclivities, and where the little soil obtainable at any depth accessible to tree roots is practically anhydrous dust, *Prunus illicifolia*, *Heteromeles arbutifolia*, and various *Rhus* will be found to expand in generous profusion their wealth of luxuriant flowers and foliage—an ever-present lesson that fundamental elements of success with other trees are not lacking if we well and wisely utilize the material at command.

WM. S. LYON, Forester.

Los Angeles, Cal.

* A scattered growth of weeds was once cut down; neglected cultivation was intentional.

*Kew Bulletin for May, 1889.

The Highway of the Nations.

In a communication to the *Railway Age*, October 18, John Arthur Lynch again comes to the front in advocacy of his favorite subject, through railway connection from end to end of the two Americas. Owing to the prominence given the communication by the *Age*, and also its partial acknowledgment of its practicability, the following from the article in question will, no doubt, prove of general interest: Mexico has made the most liberal concessions and ample subsidies for the construction of railways from the borders of the United States through her territory leading to Central America. Guatemala and others of the Central American States followed that example to a limited extent, considering their means and resources, and so have the Argentine, Chilian and Peruvian republics to a considerable extent, and the empire of Brazil, Ecuador, Bolivia, Venezuela and Colombia to a less extent, so that at the termini of the projected through line a great deal of work has been accomplished, and it requires but a few energetic efforts to be made to close up the gaps and have one grand through line of railway from Olympia on the Pacific and Portland on the Atlantic to Patagonia, where the Argentines are already building railways.

On the great Northern line to Alaska, progress has been made within the United States to the border of British Columbia, where the line has been taken up to continue it to the frontier of Alaska, and the Russian Government has been pushing her railway connections into the heart of Central Asia and the borders of China, and into what was heretofore considered the impossible, the almost inaccessible parts of Siberia, and is now drawing men to Behring Sea. China has also taken up the idea, and work is in progress on a railway from Chin Kiang to Peking that will require an expenditure of about $70,000,000.

The British East India Government proposes to extend its great lines of railway through Burmah and Thibet to connect with the Chinese system; the Coreans are planning out a system for their country; the King of Siam has authorized their construction in his dominions, and the Shah of Persia will soon have the railway engineers busy in laying out main lines through his kingdom, so that it remains with the people of the United States to bring all the nations of the earth into closer relationship by doing her part in the grand undertaking of the age, in the interests of progress, industry, the maintenance and perpetuation of peace—and therefore of prosperity and a higher state of civilization.

JOHN MCLEAN, one of the trio of Comstock miners who left for Corea last June under contract to work in the mines there, has returned. He left Frank St. John and Jeremiah Ryan at Shemulpoo. He says the native Coreans who work in the gold placers of that country look with distrust on the introduction of modern improvements in mining, as they think it will rob them of that means of livelihood. From these placers the natives produce above $2,500,000 in gold annually. The pay of native laborers is $3 per month. Those Comstock miners were paid for their lost time, but it was found the quartz they went out to work would not pay.

J. N. GRIFFIN and Jas. Wilson of Belmont, Nev., are at the Lower California mines, where they are both foremen. They say that as the Mexican law requires an expenditure of $300 and the employment of six men on the mines for six months every year, it takes a good mine to pay. There is no such thing there as one man locating a whole district and keeping out others who may wish to try their fortune under ground. Mr. Griffin reports all manufactured goods very dear, owing to the excessive duties charged, and thinks if the mines were on American soil the population would be trebled in a year.

MODOC COUNTY MINES.—Our correspondent, H. Kelley, writes us from Adin, Modoc county, as follows: "In regard to the mines and mineral sources of this locality, there is a large scope of country here unprospected. I was over the mineral belt or lode with J. H. Crossman in July, 1888, for a distance of 40 miles in a northerly direction. Mr. Crossman had a very favorable opinion of the country and was surprised to see that there had not been more prospecting done outside of Hayden Hill."

JAMES N. HYDE, who has been gold mining for the past 26 years in different parts of British Columbia, is now sojourning in Fresno. He says that in that country "there are only a few claims now running, and they are hardly making salt. There are only about 200 men, Chinese and all, on the Cariboo. The gold is of a coarse grade and requires no quicksilver to save it. Hydraulic is the principal mining, and is about all that was ever followed there. Yes, I think British Columbia has seen her best days."

THE *Calistogian* reports that while men were quarrying stone on the hillside back of Charles Foote's house, in Knights valley, a blast opened a fissure through which hot steam escapes in considerable volume and with pressure.

Artesian Wells in California.

[By C. E. Grunsky, C. E.]

The water which percolates through porous soils or which flows into crevices in the geological formation at the surface of the earth and enters by infiltration into the pervious strata of which the earth's crust is in part composed, not infrequently finds lodgment in localities where it becomes an important source of water supply.

It is such waters permeating to subterranean layers or gravel or sand, which are confined between impervious geological formations, that rise to the surface in the many artesian wells that have been bored in this State.

The term artesian has been derived from the Province Artois (Artesium) in France, where the practice of boring for water found favor in the beginning of this century.

Boring was practiced in a very early day in China, in many parts of Europe, in Asia Minor and in Egypt, and spontaneously flowing wells were by no means unknown in the countries named, though but little attention has, until within this century, been devoted to a systematic development of artesian waters.

The term "artesian" should never be applied to any water which does not spontaneously flow above the natural surface of the ground.

Although authorized by some compilers of dictionaries, it is always misleading to apply the term to wells from which no water can be obtained unless raised by pumping. Only a few miles from Sacramento there are four wells, all shallow, which have been sunk in the channel of a slough. They have tapped a water-bearing stratum of gravel from which water rises above the hight of the bed of the slough. The wells are flowing wells, yet it can hardly be claimed that they are artesian wells, because the natural surface of the ground adjacent to the slough in which the wells are located is some ten feet higher than the elevation to which the water of the wells will rise.

The water, in such geological formations as are water-bearing, has all had to travel a greater or less distance, through the air in the form of rain or snow, thence perhaps, across portions of the earth's surface, and finally through subterranean channels and interstices between particles of minerals, earth and rock to the particular point at which it has found lodgment. In this course it has been charged with gaseous matter, ammonia, carbonic acid, and with a certain amount of organic as well as inorganic matter. According to the route traveled, the subterranean water, originally pure, is always within wide limits, charged with foreign matter. Its quality for domestic use, irrigation or medicinal purposes, depends upon the character and quantity of the ingredients thus entering into its composition.

The water from a well on the northeastern shore of Lake Tulare, from the depth of 23 feet, is saltier than ocean water. The artesian waters from the Tulare county wells nearly all hold, in solution, together with other substances, small amounts of sulphuretted hydrogen. Those of Merced county nearest to the San Joaquin river are so strongly mineral in character that important medicinal properties are claimed for some of them. The deep wells near Stockton bring water to the surface from which large quantities of inflammable gas are liberated.

Experience alone, then, can be relied upon to determine the quality of water that can be drawn from sub-surface water-bearing strata.

Artesian water is rarely struck in fissures of rock—so rarely, indeed, that it is absurd to bore for artesian water in localities where it is known that the geological formation does not present stratification of large extent.

Where stratification does not exist, particularly if the layers be nearly horizontal, it will be found that not infrequently a stratum of pervious material, of which sand and gravel are typical, is inclosed between two strata—the one above, the other below, of impervious material such as close-grained rock or clay. If such a layer of gravel extend at any point to the surface of the earth, it will there receive a supply of water which, according to the amount of supply and relative elevations of the different points of the stratum, will permeate a portion of or perhaps the entire gravel bed.

If the gravel bed dip away from the point of inflow of water and has no outlet, it is evident that, as the water accumulates in the stratum to saturation, the pressure under which it is confined will rise until the head of water for all points of the gravel bed is equivalent to the hight of the point of inflow.

Should it now happen that some part of the surface of the earth directly over the gravel bed have an elevation less than the hight of the point of inflow, then a boring from above to the gravel must secure artesian water, unless the same be lost by leakage through a defective casing.

The layer of sand or gravel confined between an impervious water-bed below, and an impervious water-cap above, is typical of all artesian belts in this State of which I have any knowledge.

It is important to bear this fact in mind at all times in discussing the question of source of supply of any well or group of wells.

Deep as borings have hitherto been made, the same experience has everywhere been had, down to bedrock of our large valleys, of our mesas, and of our deserts, layers of pervious material alternate with impervious material, and the well-borer knows that if his boring were continued through the gravel bed in which, perchance, he has stopped, he would find beneath this pervious material an impervious stratum.

It is very easy then to trace our artesian waters to their source. The water must come from a distance; it must sink somewhere beyond the edges of the water-cap. It cannot come from underneath, access from below being cut off by the impervious water-bed. It must, therefore, enter the gravel or sand stratum, as the case may be, at the point where the same crops out of the surface, or at least connects with pervious material at the surface.

It is folly to look for a source of the artesian water of San Joaquin valley in the Sierra Nevada. None of our beautiful mountain lakes will ever be run dry by tapping the water-bearing strata of our great central valley.

Our great valley was at one time a great inland sea. Mighty glaciers were at work grinding down our mountain chains and depositing vast terminal morains along the base of our mountain slopes.

From the waters of the inland sea, layers of clay, of which some are in places more than 100 feet thick, were deposited. Sand was swept over them, gravel was run over them at some points, and the surface of the valley rose as the mountains were worn down by the ice and water.

The clay layers are thickest where the water of the sea was deepest. Near the central line of the valley they taper toward the east and west.

It is needless to discuss what convulsions of nature caused periodical interruptions of the deposit of clay and the formation of the sand strata. It is enough to know that the many borings that have been made prove the continuity of the clay layers and demonstrate that, to unknown depth, clay alternates with sand and gravel.

The pervious strata, open as they are to a source of supply, at once become Nature's subterranean water conduits, flat and wide.

For long distances they are closed conduits. The water they receive permeates all portions of them lying lower than the source of supply, whenever it enters in sufficient supply.

San Joaquin valley is 250 miles long and about 50 miles wide. The mountain ranges between which it lies are nearly parallel. The western slope of the Sierra Nevada mountains toward the valley is 50 to 80 miles long. The eastern slope of the Coast Range is generally but 5 to 10 miles in length. More detritus has been swept into the valley from the long slope of the Sierra Nevada than from the short slope of the Coast Range, consequently the present trough of the valley lies much nearer to the base of the Coast Range than to that of the Sierra Nevada.

The valley, where it opens out toward the outlet through the Coast Range, has not yet been built up to the hight of high tide in the ocean. Nearly 500 square miles of its surface at this point are almost absolutely level; thence land rises very gradually in the direction up the valley, but more rapidly toward the base of the mountains from points at the edges of the valley's trough. The lands rise faster toward the Coast Range than toward the Sierra Nevada.

In round numbers the general elevation of valley lands at the head of the valley is 400 feet above the sea; it is 200 feet near Tulare lake; it is 400 feet at the base of the Sierra Nevada directly opposite this lake. It is the same at the base of the Coast Range northwest of the lake; it is about 300 feet at Fresno; 150 feet in the trough of the valley directly west of Fresno; 170 feet at Merced; 20 feet at Stockton; 110 feet at the base of the hills east of Stockton.

The great eastern plain in the San Joaquin valley has a surface slope of from five to ten feet per mile from the mountains toward the valley trough.

As already intimated, the fact is clearly established, by the records of borings, that the layers of clay and sand found beneath the surface formation in San Joaquin valley dip toward the valley's trough with greater pitch than does the surface of the ground. The thickness of the clay deposits increases toward the valley's trough, decreases toward the hills, and even the deep clay merges into the surface-formation near the eastern edge of the valley. It is at that point that at or near the surface the upper edge of the water-bearing sands and gravel can be found.

Here, then, must be the source of supply for the artesian strata of our great valley.

Moreover, the pervious layers of the valley thus cropping out at their upper edges, or at least approaching close to the surface at the base of the foothills of the Sierra Nevada, are connected with or merge into the cobble or gravel beds more recently formed by the many rivers and creeks which drain the great western slope of the mountains.

Into these recent deposits many mountain streams sink; and even perennial rivers lose a very large portion of their flow by infiltrations into porous beds.

Whither does this water go, if not into the water-bearing strata already described? It finds its way, not alone into one bed of gravel or sand, but such layers by the dozen may receive it, and yet, when traced to points beneath the trough of the valley, may be widely separated by thick masses of clay. They may be hundreds, ay, thousands of feet beneath the surface. They may, when tapped from above, yield indifferent or excellent supplies of water according to the extent of each water-bearing stratum, the character of the material of which it is composed, the existence or non-existence of a natural point of outflow, and many other causes. The greater the depth from which water rises, the better is the prospect of obtaining an ample supply of water, because, other conditions being the same, it is reasonable to presume that there is less likelihood that a natural outlet from a deep water-bearing formation should exist, than in the case of others at a less depth.

Borings in the San Joaquin valley, to the number of about 300, bear out these conclusions, and a careful study of the well-borer's records reveals the further fact that there are points where some cause has interfered with the continuity of the great clay deposits. These points lie near the present river channels, and it is very likely that a large flow of water down the present river canyons into the sea was accompanied with a sand flow deposited in long ridges out from the present base of the hills toward the west.

The Tule river outflow into Tulare lake marks one of the points where the deposit of clay has been interfered with. Kings river delta is another.

Between these two points, increasing in thickness from 20 feet under Tulare at a depth of 200 feet, to 100 feet or more at a depth of 600 feet near the eastern high water shore of Lake Tulare, lies the great blue clay water-cap of the Tulare county group of artesian wells.

These remarks concerning the source of artesian water which refer to a particular section in this State, apply with equal force to all other localities in this State where a similar stratificaton prevails; and they indicate that the point at which artesian water sinks into the ground can frequently be located with precision.

Whenever this can be done, it may even be possible to determine the maximum permanent yield of a cluster or group of wells. For example, all the artesian strata of San Joaquin valley combined will never supply in the aggregate more water than sinks at or near the base of the foothills from the streams which descend from the mountains; an amount which can approximately at least be determined, and which fortunately is large enough to satisfy even the most exacting theorist.

When wells draw their supply from pervious layers of large extent, it may be months or even years before the natural storage is so decreased that equilibrium between supply and delivery is attained, before, in fact, the discharge of a well has decreased to that quantity which will be permanent till such time as further demands are made upon the same water-bearing stratum.

So soon as even a single well begins to discharge artesian water, just so soon is the hydrostatic pressure in the stratum of sand or gravel at the particular point from which the water rises reduced by that amount which the original head exceeds the head required to maintain in the well an upward flow of water. This reduction is sometimes great, being often equivalent to 20 and even 50 feet of water pressure.

If the well be of sufficient diameter to discharge at a moderate velocity, not engendering great loss of head by friction in the well-casing, all the water which the reduction of head just noted causes to accumulate (during continuous flow) at the bottom of the well-casing, then it would be impossible to materially increase the flow of the well by increasing its diameter.

Suppose the casing of a well already bored be free from leakage and fit snugly against the sides of the bore-hole through the water-cap, and it be found that water when its flow is checked by "capping the well" or by erecting a stand-pipe have a hydrostatic head of 40 feet. Let the well be one of moderately good flow, yielding from a seven-inch casing a daily discharge of 517,000 gallons, water rising from below with a velocity of three feet per second. The pressure-head required to cause this flow, if we suppose the well to be 500 feet deep, is three feet. Consequently the pressure required to force the water through the water-bearing stratum to the bottom of the well is 37 feet.

Now the question arises, will a well of twice the above-noted diameter discharge, as most books very arbitrarily tell us it ought to do, from two to four times as much water? Let us see. If it should discharge only the same amount as the smaller well, the upward velocity would be three-fourths of a foot per second. The pressure-head required to maintain this velocity would be about one foot, consequently there would be two feet more of pressure-head available to impel water through the water-bearing stratum toward the well than when only a seven-inch casing was in use. The greatest increase of flow possible would not therefore exceed the difference in the effect of 39 and of 37 feet of pressure, impelling water toward the well through its subterranean conduits. This effect may reasonably be supposed to be proportional to the square root of the pressure-heads. That is, it could not be hoped under the conditions supposed to prevail, and which can be ascertained for any properly cased well, that an enlarged well of 14 inches would discharge more than three per cent more water than the seven-inch well.

It is equally true, as in the case of the artesian wells in and near Stockton, that when the pressure-head required to maintain the upward flow of water is nearly as great as the hydrostatic pressure of water in the water-bearing strata, that a very material increase of flow must be expected if the diameter of the wells be increased.

The well-casing in ordinary use for artesian wells in this State is not water-tight. This should be regarded a very serious defect.

Any water which rises through a pipe penetrating layers of material from which water did not rise to the surface, subjects the pipe to an excess of pressure from within. Leakage must and will occur through any casing which is not water-tight. It will be greatest into dry pervious strata; least into those in which the natural water pressure is most nearly equal to the pressure within the casing. Not infrequently the water-table is 30 feet below the ground's surface, while artesian water is raised and delivered at 10 feet above the ground's surface. Under these circumstances, the hydrostatic pressure is from 10 to 40 feet greater inside the well-casing down to the water-table, and 40 feet greater below this point to the bed on which rests the stratum which carries the soil water, than it is outside of the pipe. The result must be a loss of water, unless the well-casing be water-tight.

That but a slight pressure is required to force large volumes of water into pervious strata of the earth's crust, is a fact well known to engineers, and one which has frequently been demonstrated by practical application.

Well-borers all tell us that we need not hope for a large supply of water from any well which can readily be filled by pouring water in from the top.

Near Paris, in France, there is a bored well 200 feet deep, into which about 21,000 gallons of waste water, from a starch factory, flow every 24 hours. Another well near by has a capacity of receiving 60,000 gallons each day, while still another, which for a portion of its depth has a diameter of only four inches and which is 265 feet deep, has swallowed water at the rate of 26,000 gallons per hour.

At St. Denis, in France, early this century, an artesian well was sunk to a depth of 181 feet. It supplied water of an inferior quality, but in such quantity that it flooded paths and streets, and created a nuisance. The local authorities had about decided to close the well, when, in the year 1828, Civil-Engineer Mulot undertook to mitigate the evil. By boring 35 feet deeper, he struck a second stratum, bearing artesian water of excellent quality but limited quantity. This was brought to the surface in a three-inch tube. From the upper water a seven-inch tube, encircling the three-inch tube, was also brought to the surface.

(*To be Continued.*)

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Butte.

THE GOLDEN GATE CLAIM. — Oroville *Mercury*, Nov. 1: The main dam was built and at its finish was a monument to the constant labor of 100 men, representing in a compact form the 20,000 tons of rock blasted out to build it, and the forest of trees cut to form its cribs. Its solidity was equal to that of the gigantic walls of rock which line the sides of the river. The head dam was equipped with waste-gates of capacity to handle any ordinary rise in the river, but not such a flood as first knocked upon their doors. The river was finally turned into the flume, and it carried the mammoth stream with ease, in fact leaving plenty of room for more, as was demonstrated on the 9th inst., when the flume carried three times the amount it was ever expected to take. The sub-flumes were constructed and the pumps set in operation preparatory to mining. Everything worked like a charm, and all was well until Oct. 9th, when the forerunner of the recent downpour of the elements made itself apparent. The rain fell heavily in the valley and mountains. The head dam was not injured in the least by this flood; the main flume carried three times the amount of water for which it was originally constructed, and the surplus water was let into the claim through the partly opened waste-gates. When this happened the company was on the eve of beginning mining operations. The effects of this storm faired off, however, and the work at the mine was renewed with zeal, and continued until Tuesday, the 22d inst., when the unceasing rain and consequent floods ended all hopes of the company again reaching the channel this season. On last Tuesday the river rose rapidly. The big flume was not able to carry half the water which was backed up behind the head dam. The great river poured over the crest of the dam in a stream four feet in depth; at last the massive right wing of the head dam gave way, and with a rush and roar the pent-up waters dashed through the break and in a few minutes carried from the claim all of the machinery for pumping purposes and the sub-flumes, derricks, etc., besides. Under the terrific strain the big dam held up many hours, but at last submitted to the gigantic force behind it, and gave way to the overwhelming stream. Huge boulders, weighing hundreds of pounds, were tossed into the air by the fury of the waters, and crushed and ground to sand in the crash of falling waters. Great timbers snapped into pieces and iron bolts were bent and twisted into inconceivable shapes. The waters were overwhelming, and in a few short hours the season's work in the claim was undone. The company has the grade of the main flume preserved, and the flume itself, roads, bridges, boarding camps and other buildings, besides a vast amount of lumber, poles, tools, etc., saved almost entire, which is half of the work.

Calaveras.

NEW MACHINERY. — *Prospect*, Nov. 2: A 15-horse-power engine and boiler have been put up at the Donnallan & Hagerman mine at the Bay State ranch, and hereafter the little five-stamp mill will be set in motion by steam-power, and the claim worked summer and winter. The owners have a good mine.

FINE ROCK.—L. A. Irvine brought a fine-looking piece of rock to town last week from the Spinola mine near the Jimmy Hill ranch, on the Mokelumne Hill and San Andreas road. Free gold in abundance could be seen all over the rock. The quartz was taken out of an old shaft that they recently cleaned out.

El Dorado.

ACTIVE.—Georgetown *Gazette*, Oct. 31: Business is quite active at the Taylor mine this week, and promises to be more so right along hereafter. The new superintendent, E. W. Chapman, has torn away all the old buildings and will immediately erect new buildings and equip the mine with a new plant throughout—new timbered shaft, new hoisting and pumping works, new mill of the roller kind with a 20-stamp capacity, new cars, new track, new everything. Work has been resumed on the Josephine mine, at Volcanoville. Thos. Evans, Lew Howe and two others have taken a contract to drift 600 feet on the ledge in the No. 5 or lower level. They laid in their supplies this week. It is probable that the 20 stamps will be running before long. The Mammoth Bar mine has been quite fortunate this season in having its regular 400 inches of water from the Cal. Water Co., right along, and with good prospects for its continuance until high water in the river interferes with further action of the hydraulic elevator.

Humboldt.

GOLD PROSPECTS.— Cor. *Northern Advocate*, Nov. 3: I have spent a good deal of time in prospecting Humboldt county. I do not claim that it is as rich as the placer mines in Sierra county, where I worked in years gone by. But I claim that, with proper facilities for working and saving the gold, Humboldt would soon rank among the foremost gold-producing counties of the State. The great difficulty at present is to get practical miners to investigate. A great drawback to investing in these mines seems to be fear of trouble on account of the debris question. But a look at the country would satisfy the most timid that there is very little farming-land to damage. And in regard to navigation, one trip up the river, a distance of only 20 miles, in an Indian canoe, would satisfy most any one that he was far above the head of navigation. And if he had had experience in mining he would see that he was in the heart of a great mining country, and that mining must ultimately predominate over any and all interests that may spring up—not even excepting the manufacture of redwood lumber. The great forests we have passed through in reaching here remind us that this will be one of the leading industries of northern Humboldt.

Lassen.

PAYING ROCK.—Susanville *Advocate*, Oct. 31: The company composed of Long, Peck & Thomas are working on their mine, which is situated about seven miles south-east of Susanville and near I. Scottini's ranch. Mr. Thomas showed us a piece of rock taken from the ledge, which is very good quality, with considerable free gold. The shaft is down 30 feet, and at that depth the ledge is three feet wide and widening as they go down. The company are well pleased with the recent developments, and are satisfied they have a good paying mine. In fact, they have enough good paying rock in sight to assure them that it is no pocket, but a well-defined ledge.

Napa.

THE PALISADE MINE. — *Calistogian*, Oct. 31: Forty-five men are engaged in work in and about the mine and reduction works. The reduction works are still run only 12 hours per day, and little or nothing is done under ground during the night. During the summer a great deal of wood was hauled for use at the works, and available space on the grounds about is nearly all occupied with wood, of which there are several hundred cords. The "dry process" is used in reducing ores, and for this reason the stamps and pulverizer can do far less work than if water were used. With 10 stamps and the pulverizer about a ton of ore is reduced every hour. The engine and boiler used in the reduction works are the same as were used in the mill of the old Calistoga Gold and Silver mine, though changes and additions have been made making the machinery far better than when in use on the side of Mt. St. Helena. Aside from some ore that is being taken out at a couple of places where excavations are being made for the purpose of ventilating the mine better, no work is being done except on the first level. Here stoping is being continued up toward the surface the same as during months past, and the reduction works are kept running on ore taken from there. The lower level was cleared of water several weeks ago, and it was found to be in a very bad condition. Much work and expense were necessary to put it in order. From there—the Palisade vein—high-grade ore will soon be taken and mixed with that of lower grade now being taken from the Easley vein on the first level.

Nevada.

NORTH BANNER.—Grass Valley *Union*, Nov. 3: Superintendent Skewes brought down from the North Banner mine yesterday a gold brick weighing 167 ounces, the product of five and a half days run of the mill for the past week, being the value of something over $2000. This run will more than pay the expenses of the mine for the past month. Besides the gold product the silver sulphurets saved in this run are estimated at $600. The new drifts of the mine are not yet opened sufficiently to keep the mill going constantly, but as far as opened the ore is of high grade, but with the further extension of the drifts, and the opening of the No. 3 level, which is now being sunk for, a large body of fine ore will be accessible that will keep the 10 stamps of the mill going regularly. The North Banner is making a good showing.

PEABODY.—Supt. Tilley is doing some reconstruction work at the Peabody mine. The foundations of the hoisting works are being repaired, and the water-wheel for pumping is receiving similar attention, and the structure generally undergoing improvement. When these changes are made the underground work will be pushed ahead vigorously, commencing during the coming week.

TAKING OUT GOLD.—*Transcript*, Nov. 3: The San Jose drift mine of this county is an assured success. President Spencer came down from there Saturday, bringing several nuggets of gold, worth from $1.50 to $2 apiece, that were, with many others of similar character, found there during the past week. The 300-foot tunnel is now in the channel a distance of 22½ feet, and is being pushed for the center. The deposit is of the genuine "blue-lead" kind, and is rich in gold. The San Jose people have spent much money and several years in prospecting.

HIGH GRADE ORE.—*Tidings*, Oct. 31: Ten tons of ore worth in the neighborhood of $1000 per ton were yesterday shipped to the Selby Smelting Works by the Champion M. Co.

WILL SELL AND DISINCORPORATE.—Grass Valley *Union*, Nov. 5: The Badger Hill G. M. Co. contemplates selling its real estate in the eastern part of the town and dissolving as an incorporation. The company owns over five acres of ground that is well situated for building lots. In the last operations of the company $18,000 were expended in the effort to develop a mine, but unsuccessfully. The building, machinery and pipe-line connections have already been sold.

IDAHO DIVIDEND.—The Idaho M. Co. declared monthly dividend, No. 240, yesterday, of five dollars per share, amounting to $15,500. The Idaho is the "old reliable," and has paid more dividends than any other mine on the continent.

Placer.

IOWA HILL.—Cor. Placer *Herald*, Nov 2: The repairs and additions to the mill on the Waterhouse and Dorn mine have not yet been completed. The Morning Star mine is, I hear, to have a compressor and air drills to forward their bedrock tunnel with the most possible speed. This is popularly the best mine in this district. Freight seems to be coming in rather lively for this vicinity, which indicates a prosperous condition of affairs. There are few idle men here at present. Of the upper divide we hear very little here. Report says the Hogsback Co. is running the new tunnel at Sailor canyon. The Sterrett Gravel Co. have been employing six or seven men nearly all summer. I hear that a five-stamp mill complete is on its way to Canada Hill to operate on the Buena Vista ledge, formerly operated by Van Vactor. Black canyon has not yet closed down its tunnel for the season. At Red Point the tunnel is being pushed rapidly and soon we shall get news of good pay being taken out. Damascus is quiet. Of the Pioneer, not much is heard here.

MAYFLOWER.—Placer *Argus*, Nov. 1: The shipments from the Mayflower for October aggregated $13,722.28. W. E. Beach was chosen assistant superintendent and is now in charge of the mine. Mr. Chappellet has been quite seriously ill. The south gangway is now in 1057 feet. Gravel in the north breast very good. They are breasting out 72 feet; channel getting wider. They expect good returns when the bedrock begins to raise. Very little work has been done lately on the Orono. In the end of the south gangway the channel has pitched below the track, and they have started two drifts from the end of the gangway—one west and one south.

ROYVILLE.—Cor. Placer *Argus*, Nov. 2: Capt. George Ross of No. 10 Folsom street, San Francisco, has the contract for running the Gray Eagle tunnel. The town-site is situated at the mouth of the Gray Eagle tunnel, on Owl creek, about five miles from Forest Hill. But it has resources, from the fact that it is situated in such a position that all the mining that can be done in this part of the Deep channel of the Forest Hill divide must necessarily be done through tunnels that have their outlets here. The Gray Eagle tunnel, which has its place of commencement here, is now in 250 feet, and with the new machinery which Capt. Ross is putting in place, it will not take over 10 months to complete his contract of 2500 feet. But long before that is done we expect to see a big strike made in the main channel. But this is not all for Royville, for about 400 feet above the mouth of the Gray Eagle tunnel, on Owl creek, Anthony Clark, the veteran prospector, has located a site on his Hawkeye ground for a tunnel to tap his series of claims adjoining the Gray Eagle. He has already commenced operations in the shape of putting up and repairing buildings, clearing ground, etc.

Plumas.

CRESCENT MINE.—Greenville *Bulletin*, Oct. 30: The Crescent mine now presents a busy appearance. Up to the present time, only 16 stamps of the mill have run. Mr. Whitney, the superintendent, is now putting the north half of the mill in condition, and soon 32 stamps will be operating, thus doubling the crushing capacity of the mill. An air-compressor will be placed in position to run two Burleigh drills. Another boiler and engine will be provided. These will be so placed, and of such capacity, as to furnish power to run the entire mill. The air-compressor will be run by water. The surplus water, if necessary, will be used to assist in running the mill.

Sierra.

SIERRA CITY.—Cor. *Mt. Messenger*, Nov. 2: Carpenters are at work building on the Chipps mine. The ore crushed at the Kentucky mill from the Buttes Saddle-Back mine turned out better than was expected. The Columbo leasers have put on four men this week. Only about 30 men are employed at the Sierra Buttes mine. Mr. Leffler has been appointed foreman at the Young America mine. The Marguerite is running along steadily, and is looking good. The Salinas and Mercer has started up again with plenty of water. Geo. Black has charge of the mill.

THE GOLD BLUFF has shut down for repairs to the mill. The mill is a very old one.

SOLD.—The Buffalo quartz mine at Hog Canyon was sold at Sheriff's sale last Monday for $2708.92 to S. A. Smith and Herman Shoelin. The Lone Star, owned by Andy Gibson and others, was sold this week. Gibson received $5000 for his interest.

A PURCHASE.—Grass Valley *Tidings*, Nov. 4: The Grass Valley syndicate, embracing Joseph Snyder, Andrew Husom, Stephen Long and others, has perfected the purchase of a controlling interest in the Lone Star Consolidated Mining Co.'s property in Gold Valley district, Sierra county, and 13 miles from Downieville. The Lone Star embraces 4100x1500 feet. A tunnel has been run a distance of 90 feet on the ledge and two shafts sunk in it. The ledge is of solid quartz and over three feet thick. The Gold Lake Co.'s mill is but a thousand feet from the Lone Star, and there is a good wagon-road leading to it. Mr. Snyder returned from the Gold Valley district Saturday night. He tells us that the Young America mine is on the same ridge and but two miles south, the Garibaldi intervening. The operators of this last-named property have a fine ledge and a five-stamp mill. The Gold Lake mine, also, has flattering prospects, fully justifying the outlay for the new mill. There is still another mine in Gold Valley which is being developed with encouraging results. Mr. Snyder predicts a lively camp there in the spring.

Shasta.

OCCIDENTAL.—Redding *Free Press*, Nov. 1: Jennings, Armstrong & Jones, owners of the Occidental mine on Sulphur creek, near Reid's ferry, have had their claims surveyed preparatory to commencing active operations.

THE MAMMOTH SALE.—More capital has been added to the mining industry of Old Diggings district by the purchase of the Mammoth mine, by F. H. Myers of San Francisco and Mr. Gable of Woodland. This is the mine owned by Garrecht, Young & Panter, in which was developed three weeks ago such rich ore. The price paid is stated to be $45,000, most of the money being paid down. New and extensive machinery will be introduced, and the mine put in the best shape for successful work.

Siskiyou.

SALMON RIVER.—Yreka *Journal*, Nov. 2: In the Salmon river section there is considerable excitement in reference to rich quartz prospects. At Clapboard Bar a rich find has been discovered, the quartz paying $2 to the pound, and in a place where the miners have run over during the past 30 years. Other fine prospects have also been discovered, and we may anticipate lively times on Salmon river and all its tributaries next season. Martin Andrews & Co. have been taking out considerable gold lately from their claim in bed of Klamath river at Humbug Bar, about $5000 having been taken in two days before the late heavy rainstorm, which raised the river at least two feet, causing considerable damage without damaging the claim to prevent resumption of work again.

BORING.—Several residents of Ashland, Or., who have located mining ground in Cottonwood district, near Klamath river in this county, are now boring with an artesian well apparatus to tap the blue lead, or an ancient surface ground, and expect to strike it within 300 or 400 feet, which is supposed to contain gold in rich paying quantity. The tertiary strata of the eocene, miocene and pliocene periods, in all the country along the Klamath river and its ributaries, have shown very rich prospects of gold, and in most places where fossil remains exist gold has been found, especially in the districts known to possess gold. The Hegler Bros. and Bruce Aldrich are running their steam quartz-mill on Humbug creek, about 18 hours each day, not having water enough yet to supply the batteries for keeping the mill constantly in operation. Spencer & Co., on Humbug, are busily engaged in erecting their pumping and hoisting machinery received from below, and will soon be prepared to open their ledge on a more extensive and successful scale. Mr. J. F. Boyle is now at S. F., superintending the construction of a first-class and extensive quartz-mill, for his mine at head of north fork at Humbug, and will soon have it shipped. The 25-horse power engine to run it has already been hauled to the claim.

RIVER CLAIMS.—Several river claims along the Klamath were damaged to some extent by the late storms raising the stream between two and three feet and filling up a few of them, but the companies have repaired damages and pumped out again to continue work a number of weeks yet. Messrs. Kincaid & Co. and other parties have located quartz ledges on Yreka Flat in Humbug Gulch, about a mile above the Big Ditch. The parties feel confident of having found good paying ledges, which, if so, will be very valuable, as the ledges are very wide and extensive.

Trinity.

EAST FORK.—Cor. Trinity *Journal*, Nov. 2: The North Star mines and improvements are located conspicuously at the left on the west side of the creek. The owners of the mines are now having a large stamp-mill constructed and will have it in operation by Dec. 1st. A few steps farther up the creek is located the Enterprise mine and works. For years, in fact almost from the discovery of the mine, the ore has been worked by an arastra; but about four weeks ago the present company completed its 10-stamp mill, which is now run by water-power. One battery of five stamps is all that is in readiness for operation; the other five apparently will remain suspended for a time, as there are no plates and other fixtures attached to them. About one mile farther on the road from the Enterprise are located the Coleman mines and the hamlet of Colridge. Here, too, the company are busily engaged putting up a large stamp-mill, and improvements of various kinds are steadily being made. In fact, Colridge is assuming an aspect that will eventually make it a very pleasant place for a small portion of the human family to dwell. The company at the present time may be presumed to have in its employ nearly 100 men, including about 40 Chinese who work on the ditch. From the store a trail leads onward to Yellow Jacket, Rattlesnake and New river. There are ledges being developed along the route, but it is sparsely settled. Cabins are far apart and very few accommodations. As to the pay of ores previously extracted from the mines, each and every one must judge for himself, as each company has apparently sealed the mouth of every workman. But every man can prophesy something when he takes into consideration the many improvements being made at the mines.

Tuolumne.

RIVER MINING DISASTER. — Tuolumne *Independent*, Nov. 2: The late storm effectually stopped the extensive mining operations of Mr. Moffitt, in the Tuolumne river. On Tuesday of last week the river flood carried away the dam, 400 feet of flume, and the pumps. Mr. Moffitt lost everything but his grip. They had been only able to get one week's wash of pay dirt, yielding $1100—the last day's work being $250 of this amount. This was enough to demonstrate the richness of the mine, which comprises about three-quarters of a mile of the river channel. The dam was 34 feet high from foundation to top. The rise was unexpected, and was within an inch or two as high as any time last winter. They managed to save some lumber, one or two wheels, and some of the machinery. About 50 men were employed. The $1100 only represented 10 per cent of the season's expenses. Mr. Moffitt will proceed to put in a foot-dam as soon as the flood subsides, and next season will build a permanent dam on top of this, so that he will not be troubled with such an accident in the future. The foot-dam will have its foundation of brush, and the cliff near will be blasted down on top of this to hold it. The debris above will fill in above and make a solid foundation. This will hold all the loose wash from above, and the current then will scour and strip the claim below. This stripping generally consumes most of the time of the short mining season, and prevents but a small portion of gold-bearing gravel from being mined. It is hoped that this plan will enable the enterprising gentleman to secure his reward next summer.

POCKET. — Tuolumne *Independent*, Nov. 2: Hank Gale and Jim Wickham struck a rich pocket in their claim at Jackass Hill. On Wednesday they took out 62 ounces; Thursday, about $600; and more in sight.

DID NOT PAY.—The miners who undertook to sink the new shaft on the Bonanza mine have thrown up the contract, as they failed to make it pay. Some of the miners went back to work yesterday, for wages.

GOLDEN GATE.—The Golden Gate mine has been closed down for the past few days on account of some defect in the roasting furnace, but will start up again as soon as poss ble. This mine now has about 40 names on the pay-roll.

NEVADA.

Washoe District.

ALTA.—Virginia *Enterprise*, Nov. 2: The mill is running steadily, crushing about 45 tons daily. The 600 level northwest drift, to tap the ore body, is being pushed forward. The stopes are looking well.

BALTIMORE.—Still saving ore from the exploration work on the 225 and 338 levels.

CROWN POINT.—The 600 raise connected on the fourth floor of the old stopes and gives a good circulation of air. The 800 winze is down 25 feet. The bottom shows spots of ore, but low grade on the average. Have cleaned out the 900 drift south 504 feet.

BELCHER.—The 1200 east crosscut No. 2 is out 104 feet; advanced 20 feet during the week, the face in soft porphyry. East crosscut No. 3 on the 1200 level is out 52 feet; face in low-grade quartz. No. 1 east crosscut on the 1000 level advanced during the week 22 feet; total length, 63 feet.

SEG. BELCHER.—The 1200 south drift advanced 55 feet during the week; total length, 90 feet. The face is composed of clay, porphyry and streaks of quartz.

YELLOW JACKET.—Shipping 65 tons of ore daily to the Brunswick mill. The west drift on the 500 level is out 730 feet. The 800 and 900 level north drifts are out 780 feet.

CON. IMPERIAL.—The joint Confidence, Challenge and Imperial north drift on the 500 level is now in 1094 feet from the Yellow Jacket shaft, 34 feet having been made during the week. The face shows quartz and porphyry. The east crosscut from this drift is out 158 feet, 25 feet having been added during the week. The face shows granite. The west crosscut from the 300 level north drift is being repaired, and the east drift from the bottom of the winze on the same level is now connected with

the Imperial new shaft, thus supplying a good circulation of air, which will thoroughly enable us to prospect this portion of the mine. The work in the Challenge and Confidence is jointly with the Imperial.

OVERMAN.—Upraise on the 25 level, 100 feet east of southwest stope, advanced 25 feet. Material, quartz and porphyry. Quartz giving fair assays. South drift on the 52 level is in 35 feet past west crosscut on the seam of ore. Southwest drift, 63 feet above the track floor of No. 3 stope, has been extended 14 feet. Material, porphyry. Timbered 35 feet of Lambert upraise.

CALEDONIA.—West crosscut No. 2 has been extended 16 feet. Material, vein porphyry. Total length, 114 feet.

JUSTICE.—The 622 level north drift advanced 67 feet; total length, 242 feet. The southwest drift, 490 level, extended 23 feet; total, 426; face chiefly porphyry. Shipped to the mill 214 tons; average battery assay, $19.51 per ton.

CHOLLAR-POTOSI.—Owing to repairs to surface machinery, no work was done in these mines the past week.

EXCHEQUER.—The 382 level east crosscut, 150 feet south of the north line, is out 34 feet; face in porphyry. West crosscut on north line, 500 level, is out 45 feet; face in quartz giving low assays.

ALPHA.—The shaft is sunk and timbered 100 feet below the 500 level. West crosscut, 150 feet north of shaft, 500 level, is out 325 feet; face in hard porphyry.

SILVER HILL.—The 260 level northwest drift advanced 20 feet through porphyry; distance from shaft, 700 feet. The 160 level northeast crosscut in southeast drift, 630 feet from shaft, advanced 20 feet through porphyry; distance from shaft, 830 feet.

NEW YORK.—The 800 level raise is up on the slope 100 feet; the roof in quartz giving fair assays. Have resumed work in the north lateral drift, 800 level.

WARD COMBINATION SHAFT.—The station at the 1800 level is completed, and a joint drift started west.

SAVAGE.—On the 400 level the southwest drift from the top of the north upraise is out 55 feet, 28 feet having been added during the week. Are stoping ore from the north drift on this level. On the 500 level are extracting fair-grade ore from the north and south upraises; also from the east drift from upraise No. 2. Have men engaged at necessary repairs on the different levels and in the main shaft. Have hoisted 71 cars of ore during the week.

SCORPION.—On the 520 level the south drift was advanced 50 feet, making its total length 380 feet. There is no change in the character of the ground since last report.

HALE & NORCROSS.—On the 300 level No. 1 west crosscut was advanced 20 feet; total, 125. No. 1 east crosscut is now advanced 50 feet, 25 added during the week. On the 500 level they have cleaned out and retimbered the east upraise a distance of 50 feet. This upraise shows considerable pay ore. Have finished retimbering the main north drift on this level. On the 1200 level an east crosscut is advanced 45 feet; face in porphyry showing some quartz.

Comet District.

LOW-GRADE ORE. — Pioche *Record*, Nov. 1: John Trewick and E. A. Shear went out to Comet district last Monday to examine the mining property there which Mr. Shear has bonded. Mr. Trewick came from Salt Lake to examine the property. Comet district is bound to come to the front as soon as the transportation facilities or local reduction works render it profitable to mine low-grade ore. Ore which in other sections of the country is extracted and made to pay dividends, is in Comet district thrown over the dump as waste, or allowed to remain in place. A mineral belt exists there, however, which will some day contribute largely to the wealth of the country.

A POOR MAN'S CAMP.—Park City *Record*, Nov. 2: E. A. Shear has become interested in the mines of the Comet district, near Pioche, and he declares that with the advent of the Union Pacific railway there will be no better place for a poor man to locate and develop mining property.

Jefferson District.

PROSPECTING.—Belmont *Courier*, Nov. 2: Considerable prospecting is being done in Jefferson mining district.

Morey District.

SILVER.—Belmont *Courier*, Nov. 2: The mine at Morey is still yielding rich silver ore in large quantities.

Pioche District.

RAYMOND SHAFT.—Pioche *Record*, Nov. 1: At the Raymond shaft the work of pumping out the winze on the 12th level will begin in a few days. The engine stationed there is nearly in place. It has been thoroughly overhauled at the shops during the past two weeks. Yesterday morning the small pump in the winze was run for an hour, and the water lowered 7 feet. It was an experiment. Steady pumping will not begin for some days yet. The Yuba Co. is hoisting ore from the 12th level of its mine and shipping it to the furnace. The ore as it is hoisted from the mine is comparatively free from waste and will average 100 ounces in silver per ton. The Yuba on the 1200-foot level has looked exceptionally well for some time, and it will be the main stay of the company in supplying ore for the furnace which will now soon be in operation.

Robinson District.

GOLD.—Eureka *Sentinel*, Nov. 2: Parties just in from Robinson District, White Pine county, report great excitement prevailing over the new gold discoveries there. Nothing like it has been known in Eastern Nevada since the discovery of the marvelously rich mines of Treasure Hill in 1868. The people of Ely and Ward and Taylor and the surrounding country are simply wild with the gold fever. It appears from latest accounts that gold is found over a very considerable area of territory—perhaps two miles long by a mile in width. A great bluff standing up hundreds of feet is found to be a mass of gold-bearing quartz worth $30 to $50 to the ton. The richest claim so far as known is owned by Mr. Watson, one of the pioneers of the district. Mr. House, the butcher of Ely, also has another good claim. The discovery of gold in the immediate locality under notice is of recent occurrence. McGill & Lyons had worked a low-grade gold ledge with varying success about three miles away. Robinson is an old district, but no one had looked specially for gold. There can be no room for doubt that gold is now found there to an extent that promises to be important—but how important we are not prepared to say. The prospects as far as tested would seem to justify the belief that the new field is both rich and extensive. If these discoveries had been made thousands of miles away, the roads would now be lined with pilgrims from every part of the country.

Tybo District.

DIMICK.—Belmont *Courier*, Nov. 2: A party of Salt Lake capitalists inspected the Dimick mine this week. This is one of the most promising mining properties in Nye county.

ALASKA.

THE BEAR'S NEST MINE.—*Oregonian*, Nov. 1: Since the unwelcome news was received here that the Bear's Nest mine, on Douglas island, Alaska, had proved of no value, but little has been heard from the mine. It was known, however, that some of the persons interested still had hopes that the mine might prove to be of value, and now it is learned that some of the largest holders of the stock in England have sent out two experts to make a thorough examination of the mine and decide whether it possesses any value or not. A citizen of Portland, who was in London when the news arrived there that the mine had proved worthless, says it caused great excitement there, a large number of people having invested a larger portion of their fortunes in the stock. It is pretty evident that the expert who tested the ore from the boring made by the diamond drill was cheated and fooled by the substitution of other rock for that taken out by the drill.

BRITISH COLUMBIA.

FRAZER RIVER GOLD.—Inland *Sentinel*, Oct. 30: William Teague of Yale and B. Douglass of Westminster own 402 acres of placer ground across the Frazer from Yale. They have interested a syndicate of London capitalists in the ground, and operations will soon be commenced to open it up. The machinery is now on the way from England, and is expected to arrive early in November. Water for hydraulic will be taken out of Yale creek and conveyed to the ground in pipes suspended from a cable stretched across the river. John W. Oliver will be the resident manager of the syndicate, and an office is already being fitted up at Yale. The syndicate's expert, J. H. Collins, is on his way up from Old Mexico, and on his arrival work will be begun. Yale may have a revival of former greatness if this hydraulic mining business proves a success.

COLORADO.

BOULDER COUNTY.—Cor. Denver *Republican*, Oct. 31: Mining in Boulder county keeps up in the even tenor of its way. There is no boom and no collapse. The Potosi mine at Caribou has been cleared of water which has stood in it for years, and is likely to soon be numbered among the paying properties of that camp. The Richmond mine at Salina, which has in times past yielded remarkably rich ore, but which was for some unknown reason shut down, is also being cleared of water and is to be worked again. It is near the famous Ingram mine, and when developed, as is the Ingram, may prove as good property. Machinery for the Modoc mine, at Ward, is still arriving at the Boulder depot and will be taken to Ward by freight wagons. The Ingram mine, at Salina, owned by St. Louis parties, is doing very well under Sam Galusha's superintendence. The Emancipation, Grand View, American, Nil Desperandum, White Crow, Sheridan, and other mines at Sunshine, are being worked satisfactorily. The Buckhorn mine at Jamestown is shut down because of a lawsuit. Some good ore is being taken out of the Potosi mine at Magnolia by Martin Comerford. It is an extension of the Kekiouga mine. Add Oregon.

GREENHORN DISTRICT.—*East Oregonian*, Nov. 1: Information comes from the Greenhorn district that the lucky prospector, Mitchell, who made the recent rich strike near Robinsonville, worked 10 hours with a mortar not long ago, and pounded out $7000 worth of gold. The ore was taken from an exceptionally rich pocket of decomposed quartz found in the mine.

DAKOTA.

REDUCTION WORKS.—Deadwood *Pioneer*, Nov. 1: Col. Carpenter's force, in spite of bad weather, was actively engaged at site of reduction works. Clearing up debris and straightening out affairs is practically complete. Carpenters will go to work in a few days.

DEADWOOD SMELTERY.—Authoritative information is at hand that if machinery for the Deadwood smelteries has not already left Chicago, it will be started to-day or to-morrow. The shipment includes all necessary for a 20-ton plant. Its arrival depends only on the time required for transit between Chicago and Deadwood. As the plant is complete and an extensive building to put it in is not requisite, probabilities are it will be in operation for thorough test of the dry process before close of this month.

SHIPPING ORE.—Several Galena mines are working forces taking out ore and shipping to eastern smelteries for reduction. Most of the product now goes to the works at Aurora, Ill. These have only recently been established, and mine-owners claim give better and quicker returns than do either the Omaha or Kansas City works. The distance is greater and freight charges consequently heavier. Claim-owners assert, however, that this is more than offset by the larger figure allowed for lead the ores contain and by the dispatch with which returns are received. Shipping is, nevertheless, costly; and owners of the properties referred to hail with delight prospect for speedy blowing in of the Galena and Iron Hill smelteries, and for establishment of large reduction works in this city.

IDAHO.

PARK NOTES.—*Record*, Nov. 2: The Southern Tier group of mines, the bonanza of Snake creek district, have been undergoing developments all summer, the work being done by contractors. As soon as connections can be made with the old workings for ventilation, the mine will be capable of producing more ore than ever. Of course developments will have to be continued to bring this about. If the condition of the roads permits, a large shipment of high-grade ore will be made from the Southern Tier before winter sets in.

THE UNCLE HARRY.—The leasers of the Uncle Harry mine, which is close to the Woodside, have obtained an extension of 12 months on their lease from the owners, and the calculation was to resume work this morning.

THE ALLIANCE.—The mine is in a quite satisfactory condition and a considerable force of men is engaged in opening up the ore reserves above water level.

CAMP CROSSCUTS.—Bad roads have interfered with ore hauling the past week. The various jiggers have made a profitable run this season, notwithstanding the scarcity of water. Another body of ore was encountered in the old workings of the Woodside Thursday, and a drift from below is being run to tap it. The Ontario three-mile drain tunnel is in a distance of over 2600 feet, and better working ground than her-tofore is being driven through.

ORE AND BULLION SHIPMENTS.—During the week the Crescent shipped about 130,000 pounds of concentrates. The Ontario bullion shipment for the week was 28 bars, containing 16,358.18 fine ounces of silver. The output of Daly bullion from the Marsac mill for the week was eight bars, containing 7142 fine ounces of silver. For the week just ended the Mackintosh sampler received and forwarded 421,050 pounds of Ontario ore; 151,180 of Daly; 100,880 of Alliance concentrates from the Union concentrator; 84,770 of Mayflower No. 7, leasers' ore; and 22,150 of Woodside ore; total, 780,030 pounds.

BUNKER HILL & SULLIVAN.—Wardner *News*, Nov. 2: The Bunker Hill & Sullivan M. and Concentrating Co. will, on next Monday, commence the construction of a dam across the South Fork at the mouth of Elk creek. It will measure 400 feet and extend the whole width of the river, being four feet high in the stream and eight feet on the banks. It will be composed of logs, braced and bolted together, with clayed and planked bottom. The building of a flume 10 feet wide and four feet deep, for which the grading was done last summer, will also be commenced on Monday. It will be two and a half miles long with a capacity of 12,000 inches, and will furnish water-power to run the 400-ton concentrator to be erected at Kellogg. One million feet of lumber has been ordered from the Cameron Brothers, over one-half of which will be used in this structure. This denotes the carrying out of the mighty plans the Co. has resolved on. The erection of the 400-ton concentrator will follow, and that will cap the climax of the grand mining enterprises in and around Wardner.

MONTANA.

IN CABLE DISTRICT.—The Cable mill is running 30 stamps on first-class ore, and there is every indication that this run can be maintained. The Red Lion is running full capacity and with the brightest of prospects. The proprietors are in fine spirits and look forward to a prosperous season. Salton Cameron's new mill is slowly assuming shape, and will of course add materially to the resources of the camp. As soon as completed the mill will be run on ore from the Southern Cross, which is showing up better and better as work advances. A large amount of ore is in sight and the mill will be run to its fullest capacity. The Pyrenees mine has shut down and will probably not resume operations until spring. The prospects of the camp are very bright, and the coming season bids fair to be a busy and successful one.—*New Northwest*.

PHILLIPSBURG.—*Mail*, Oct. 26: If the organizations of new mining companies can be considered a criterion for prosperity, Phillipsburg certainly has a fine outlook for the future. Scarcely a week passes now that some new company does not come into existence, and to-day we have orders in our job department for stock certificates for three new organizations. And what is most encouraging about these new companies is the fact they are composed of home capital, and are not the so-called "wild-cat" adventures; but to the reverse, they have confidence in the properties they are undertaking to develop and spend their own money in doing so.

HARVEY CREEK DISTRICT.—Phillipsburg *Mail*, Oct. 31: Harry Sparks, formerly superintendent of the Red Lion, was in Phillipsburg Monday, on his way home from a trip into the Harvey Creek district, about 30 miles northwest of Phillipsburg. He gives the *Mail* very favorable reports on that district, and thinks it will eventually become a big camp. The Alps company continue developing their property, and it is their intention to commence the building of a 10-stamp mill as soon as enough snow falls to have the material hauled in on sleds, as the wagon-road is not yet in a condition to permit heavy loads being taken over on wheels. There are now only about 20 men in camp, which includes eight that are employed by the Alps Co.; the others are engaged in representation work, and as there are many encouraging-looking prospects in the vicinity, it is the general opinion that next season will be a lively one in that camp. When the new road is fully completed between Phillipsburg and that place it will have cost the miners not less than $3000, which shows quite conclusively the confidence they have in the Harvey Creek district.

ORE SHIPMENTS.—During the past ten days there have been numerous shipments of ore made from Phillipsburg, which is most likely due to the fact that the miners are beginning to realize that winter is close at hand and that they must prepare for it—sell their ore and lay in the usual supply of provisions.

ACTIVITY.—Butte *Miner*, Oct. 31: Considerable activity is now being manifested in mining circles in all parts of Montana. New prospects are being developed with wonderful rapidity and good results in and about Butte. On every side of the city new hoisting works for the purpose of developing the many promising properties are either in course of erection or have been lately finished, and are busy hoisting to the surface ores of various degrees of value. In no less than 1000 places in and about Butte holes from 5 to 200 feet in depth have been sunk by lessees and prospectors from many of which good ore has been taken, but later on abandoned by the workers because of a lack of capital to further continue the work.

ORO FINO.—Experts are of opinion that it will not be long before the mines in that district will place it in the front rank among the mining districts of Montana. The fame of the Champion is already established beyond a peradventure, with the chances of its rivaling the Granite Mountain itself in productiveness. The village that has already sprung up near that mine, from which it takes the name, Champion, will soon be a place of bustling activity, having already 30 or 40 houses and stores in it and others in course of erection. It is about 16 miles in a southeasterly direction from Deer Lodge, with excellent roads leading to it.

THE PARROT SMELTER.—The Parrot smelter is now running full blast, an ample supply of water having been obtained to start the concentrator. It is the intention of the company to keep all departments running to their utmost capacity during the entire winter. The bullion output of the Parrot is phenomenal, and it may be truthfully stated that no other plant of its capacity in Montana is earning a larger profit from the same class of business. In addition to an output of 1,000,000 pounds of refined copper per month, it ships almost twice as much silver bullion as any other works about Butte. The product of the mine and smelter is sent to Bridgeport, Conn., where the company has an agent whose business it is to handle it.

THE BLUE WING.—The Blue Wing, situated in the heart of Walkerville, is shortly to be developed on a grand scale. It is the property of the Alice Company, and although a shaft of several hundred feet in depth has already been sunk on the property, it is the intention of the owners to "send her" further down. New hoisting works are being erected, new machinery placed in position, and in a short time the Blue Wing will be flying high with Wm. E. Hall as its booster.

NEW MEXICO.

DEVELOPMENT WORK.—Silver City *Enterprise*, Nov. 1: The Bremen mill has started up. The Standard mill at Gold Hill has again started, with plenty of ore to keep it busy. W. Mitchell, recently of Los Angeles, Cal., has purchased a mine on the Mangas from Henry Miller and Chas. Metcalf. He will soon put a force of men to work to develop the same. Before leaving for the North, Prof. Hand visited the Pacific mine, and said that he considered it the largest mine that he had yet seen in this Territory. Still another immense strike is reported in the Bremen. The ore was first struck Friday last while sinking a shaft in new ground, and has gradually developed to ten feet in width. The ore assays about $300, and from present indications may prove to be one of the big strikes for which the Bremen has always been famous. C. S. Kellum of Gold Hill last week sold the Minneapolis mine to George H. Utter of this city; consideration, $10,000. Mr. Utter will soon have a force of men at work developing the property. The ore will be treated at the Standard mill. John A. Miller has secured a working bond on the Nugget mine, Carlisle district, which is one of the richest mines of that section. He has also leased the Rain-in-the-Face and the Telegraph mills, through which he will work the Nugget ore. Nate Scarritt, who will be in charge of the mine, left Monday morning for Carlisle, and will commence work on the mine at once. It is said that there is $50,000 worth of ore in sight.

ZINC which does not average from 55 to 65 per cent will not pay in Southern New Mexico, unless very greatly reduced freight rates can be secured, or works of some kind erected at the mines. It has been tried in this section several times, and the above can be relied on as very nearly correct.

OREGON.

CORNUCOPIA.—Cor. Bedrock *Democrat*, Oct. 31: The larger portion of the assessment work has been done for this year and in most instances with good results, and while our people have not been able to induce capital to invest in the mines this summer, yet advances have been made, as more experts and capitalists have visited our district this year than in all former seasons, and in each instance we believe they have been impressed with the permanency of the veins and richness of the ores. The greatest need of our camp is that mining men on the outside may obtain a correct knowledge of the mineral resources of the district. Mr. W. F. Davis, of Union, has completed the erection of a Huntington quartz-mill of 10 tons capacity. It is just reported that the Oregon G. M. Co. have struck the ledge in the lower tunnel of the Red Jacket mine and that the quartz is rich. This is a happy strike for our camp, as it was beginning to settle deeply in the minds, not only of the non-mining portion of the people of our camp, but extending further outward, that the vein did not extend downward, and as the works are the deepest in the camp, this belief was beginning to cast its shadow over the development of other mines. The Red Jacket contains two ore chutes. The south chute is about 500 feet in length and north of which there is a barren section of about 300 feet, and north of this barren section the north chute exists which extends about 300 feet to the northern boundary of the mine. Thus from the south end of the ore chute to the north boundary of the mine, a distance of about 1100 feet, is, with the exception of about 300 feet, a continuous ore body.

PROSPECTS.—Jacksonville *Times*, Oct. 31: The prospects for a good mining winter are very fair. Mathis & Birdsey of Foot's creek precinct have everything in shipshape for a big run. Davis Bros., on Missouri flat, are working five men and report excellent prospects. They show some very fine specimens of dust. Should there be a wet winter a large amount of gold-dust will be extracted, for the miners are better prepared than ever for a good run; besides, most of them are now in their best paying ground.

UTAH.

REVIEW.—Salt Lake *Tribune*, Nov. 1: The special event of the week has been the sale of the Northern Spy at Tintic to the Bullion-Beck people, at a price supposed to be about $70,000. It is both a good sale and a good buy. The product of ore and bullion for the week has been good. The receipts in this city for the week ending October 30th inclusive, were to the value of $116,072.19, of which $70,043 42 was in ore and $46,028,77 in bullion. For the previous week the receipts were of bullion $54,472.92, and in ore $84,773.48, an aggregate of $139,246.40. The product of the Ontario for the week was from ore sales, $14,125.35; no bullion. The Daly output for the week was in ore sold, $4715.49. The Hanauer smelter produced during the week bullion valued at $22,525. The Germania has been running full blast for three months, both smelting and refining, but the product has not been reported.

MECHANICAL PROGRESS.

Hardening and Tempering Steel.

We last week devoted a large space in these columns under the above head to some interesting and instructive remarks made by Professor Austen at the late meeting of the British Association. The remarks then quoted were of a decidedly instructive and practical nature. We give below a brief history of the progress in the knowledge of the art of hardening and tempering, as related by the distinguished professor, and reported in the Chicago *Journal of Commerce:*

Notwithstanding the great importance of the art of hardening and tempering, the theory of the process is still far from clear, and such knowledge as we possess has been but slowly gathered. It was shown that in early times great pains were taken to secure what was believed to be a suitable solution for quenching the hot steel so as to abstract its heat. Othello's sword, Shakespeare said, had the "ice brook's temper;" but cold water was far too simple a material for many a sixteenth-century artificer to employ, as is shown by the quaint recipes for hardening steel which have been handed down to us; the operator being directed in a manual, published in 1531, to take "snayles and boil them with rainwater, taken in the two first months of harvest," in which solution if hot steel were plunged it would be very hard. The craftsman was prettily told, so late as 1809, that he might take the root of blue lilies, infuse it in wine, and quench the steel in it, and the steel will be very hard. The belief in such quaint "nostrums" survived into the present century, and it was pointed out that the early workers were right in attaching great importance to the nature of the fluid in which the steel was quenched, though their theories were wrong, the degree of rapidity with which heat is abstracted from the cooling steel being as important at the present day as it ever was.

Prof. Austen then traced the history of the theories relative to the internal constitution of steel, pointing out that the work of Bergmann of Upsala showed, in 1781, that steel only differs from iron by containing two-tenths to 1½ per cent of carbon. The curious relation between the belief in the existence of phlogiston, and the fight made by the phlogistic school with that of Lavoisier over the constitution of steel, was dealt with at some length, and it was pointed out that the work of Bergmann, though himself a believer in phlogiston, had entirely changed the situation by showing that carbon was the steel-giving element. Clouet did much to prove (1798) that carbon in its diamond form could combine with iron and convert it into steel, a fact which had been confirmed by a working cutler, Mr. H. Pepys, in 1818, and finally by Prof. Austen himself, who, for the purpose of the lecture, had heated diamond and carbon together in vacuo, because in all previous experiments a doubt as to the action of gases contained in the iron had existed.

Hardening, said the professor, is the result of rapidly cooling a highly heated mass of steel. "Tempering," or softening, consists in reheating this hardened steel to a temperature far short of that to which it was raised before hardening. He demonstrated these facts by hardening and tempering three sword-blades of the same steel and of excellent quality, showing how greatly the efficiency of the weapons depended on the treatment they received. A sword-blade which was over-hard snapped under gentle pressure into many fragments, while one which was overtempered could be bent by hand and remain crooked. Prof. Austen stated that such facts are of vital importance to the nation. He said that ironworking is the only art "of any consequence which we have at present in England," and that on armor-plates "our courage and endurance are written forever with an iron pen on iron parchment."

INTERESTING EXPERIMENTS IN "COLD SHORTNESS."—During litigation in a boiler explosion case in Toronto, Ont., recently, a number of experts were examined on "cold-shortness" of iron. A broken rivet from the exploded boiler was shown in the court, and from the appearance of the fracture the experts said, under oath, that the iron in the rivet was "cold short." Mr. W. Raub, an eminent mechanical engineer, who was employed by the defense, stated before the court that no person could tell the quality of iron by the fracture unless he saw the fracture. Mr. Raub secured a bar of best brand Lowmoor iron, took it to a blacksmith shop, cut a nick of about one-eighth of an inch thick all around it, tapped it gently with a small hammer for about an hour and then hit it hard with a sledge. It broke off "as short as a carrot." He then turned the other end over, after nicking it, and of course the fracture showed a beautiful fiber. The "short" end of the bar was first showed the experts, who one and all said it was "cold short," but when shown the other end of the same bar they were dumbfounded. Mr. Raub had by his light tapping completely crystallized the one end of the bar and had left the other intact.

AMERICAN PUMPS, ETC., AT THE PARIS EXPOSITION.—Whatever may be the meagerness of the general exhibit of the United States at the exhibition, observers from this country find much consolation in the fact that for the actual maintenance and operation of the water supply and hydraulic machinery, the exhibition is dependent upon American pumping machinery. Should the visitor go to the pumping station upon the banks of the Seine, he would find a Worthington high duty pumping engine at work supplying the Exposition with water; the elevators in the famous Eiffel tower are operated by pressure pumps of the same make, and numerous other American pumps are engaged in serviceable capacities all about the exposition. He will also find American elevators doing the important duty in that direction at the Eiffel Tower. The absolutely unique display of the wizard of Menlo Park covers a multitude of omissions in other directions.

HEAT EFFECTS ON BOILER PLATES.—A French engineer has prepared a paper giving the results of experiments on the transmission of heat through boiler-plates, and the damage which may be caused to the plates through forced fires. The first series of experiments was undertaken to find out the efficiency of different parts of the heating surface in a boiler. These were carried out on an ordinary cylindrical boiler with external surface. A section of the heating surface was isolated from the rest by internal partitions, and the steam produced on that section measured separately. It was found that immediately over the fire the average evaporation in ordinary work is about 30 pounds of water per square foot of heating surface per hour, and that with forced fires this may rise to 50 pounds, but at the risk of burning the plate, especially if it be covered with scale. In a second series of experiments the actual temperature of the plate was measured by means of fusible plugs of different melting points, and it was found that with clean plates seven-sixteenths of an inch thick the temperature never became dangerously high, even if the fire was forced. In another series the effect of incrustation and deposition of fatty substances on the inner surface of the plates was ascertained, and it was found very easy to produce the spheroidal state when the plates were covered with grease. Nearly all the fats were found to produce this effect, but linseed oil to a lesser degree than the other oils.

AMERICAN MACHINERY IN AMSTERDAM.—The United States Consul at Amsterdam considers that the trade in American machinery in his district is capable of great development. He says: "Worthington steam pumps have been introduced into this country, and are in considerable numbers now in use in water works, sugar factories, by the Royal marine, and for boiler feeding in several manufacturing establishments, and they are everywhere giving perfect satisfaction. Hydraulic elevators, made by Otis Brothers of New York, have been imported and are in use in several hospitals at Rotterdam and Arnheim, and in a hotel at Amsterdam. The superiority of American laundry machinery goes undisputed. A number of steam laundries have been supplied with washers, steam mangles, and with ironing machines for ironing collars and cuffs. About two years ago the Gardner governor, made by the Gardner Governor Company, Illinois, was first brought here, and notwithstanding competition from German manufactures, found a ready sale. Agricultural machinery and implements in considerable variety have found quite a market in Holland. Hay and manure forks were largely imported a few years ago, but have declined, owing to their light construction and the difficulty of repairing them."

A FEAT OF IRON-MOLDING.—A curious and noteworthy instance of expert foundry work is noted by the *Commercial Bulletin* of Boston. It consisted of three plates of cast iron about one-fourth of an inch thick and seven by five inches in surface covered with writing indented in the iron. This specimen of skilled workmanship was done by John Farrar, foreman at G. W. & F. Smith's foundry, a lifelong workman in an iron foundry. The impression on the iron is made by writing backward on thin paper, pinning the paper in a mold, and then pouring on the iron. The writing thus transferred to the plates when the iron is cooled, is wonderfully clear and distinct and is so deeply imprinted as to defy any attempt at erasure. The reporter showed these plates to several gentlemen familiar with iron work, and themselves skilled workmen, who declared that they never saw anything like it before.

A NEW ALLOY.—A new alloy has been discovered by Herr Reith, of Bockenheim, Germany, which is to practically resist the attack of most acid and alkaline solutions. Its compositions are as follows: Copper, 15 parts; tin, 2 34 parts; lead, 1.82 parts; antimony, 1 part. This alloy is, therefore, a bronze with the addition of lead and antimony. The inventor claims that it can be very advantageously used in the laboratory to replace vessels or fittings of ebonite, vulcanite or porcelain.

A NEW PROCESS OF BURNISHING STEEL THAT IS EFFECTIVE.—In M. Meriten's new process for burnishing steel, the metal is placed in a bath of water at about 180 degrees F., and is connected with a source of electricity just strong enough to decompose the water. Under these conditions, the plate becomes coated with a layer of magnetic oxide, which is firmly adherent and will take a high polish.

A BOSTON genius has discovered a sure means of preventing boilers exploding. His plan is to keep the water in them cool.

SCIENTIFIC PROGRESS.

Animal Sociability and Other Peculiarities.

Some curious facts bearing on the morale of the lower animals are given, says *Nature*, by a correspondent of the *Review Scientifique*. One source of animal sociability is a permanent sexual friendliness, making individuals mutually agreeable. Thus in stables without stalls, it is desirable to put animals of opposite sex next each other to avoid injuries. A mare may be safely put into a field containing a horse unknown to it, but if two unacquainted horses be thus put together, they will fight. A stallion, indeed, will sometimes get injury from an unknown mare put into a field with it. Again, the authority of the oldest and strongest in a group of males often favors sociability. In the Spanish ganaderias, a horseman will lead about a numerous troop of bulls by means of five or six bulls who obey him and maintain order. In the Madrid circus, the writer saw three of these animals bring to its stall a vicious bull which had ripped up five or six horses and mortally wounded its espada. They made a slight movement of their horns, but the creature, after a little hesitation, turned and followed them.

Why Geese and Ducks Fly in a Triangle.

When flocks of wild ducks and geese have to go long distances, they form a triangle to cleave the air more easily, and the most courageous bird takes position at forward angle. As this is a very fatiguing post, another bird, ere long, takes the place of the exhausted leader. Thus they place their available strength at the service of society.

The Homing Faculty in Animals.

The existence of the homing faculty in many animals is well known, but is none the less mysterious. It is known, for instance, that many honey-hunters find their prey by catching bees and letting them free at different points. Each bee strikes home immediately, and so, to find the beehive, one only needs to follow the bee-line of two or three bees, as they point to one and the same spot, and come across each other at the very spot where the hive is to be found and is actually discovered. Eels and fishes often go from one pond to another, very distantly located, or from a pond to the sea, in a quite straight line, without any mistake. It would seem that this homing faculty pre-exists to all individual experience, since Humphrey Davy informs us that he has seen a young alligator, which had just got out of its egg, which had been broken by this observer, make immediately for the direction in which water was close by. Again, a falcon, sent from Teneriffe to the Duke of Lerme, in Southern Spain, managed to escape, and 16 hours later had returned, quite exhausted, to Teneriffe. A dog, carried from Mentone, in the south of France, to Vienna, came back to Mentone, and a donkey of Gibraltar, which was shipwrecked 300 kilometers away, on the Spanish coast, also managed to get to his home in Gibraltar.

Atmospheric Electricity.

The earth may be likened to a huge armature, and the surrounding atmosphere the core; the clouds are the field coils containing the active element. The armature has its two terminals, positive and negative, or north and south, and the surrounding atmosphere its two opposite characters of magnetic attraction. The higher potential of the earth current flowing out at the south pole passes through space and the media of the clouds to the north polar axis of the earth, and manifests itself as it concentrates at the poles as the Aurora, which is similar in character to the striated bands seen in a Geisler tube when a static current is sent through it.

The lines of force radiating from all over the earth's surface pass into space through every spire of vegetation, and this is the accelerating influence when combined with the sun's rays in summer that causes the sap to flow and blade and bud to stretch upward. Just as the metal-head when charged with a static current will cause each individual silken hair to stand on end, and thus dissipate the overcharge into space and restore the equilibrium. Clouds are formed of finely laminated particles of frozen water, as thin as gold-beater's skin, and thinner, frozen in space from the latent moisture of the lower strata of atmosphere infinitesimally small atoms of water forming this flocculent scale, which absorbs the electricity between its scales and by its action forms positive and negative characters to these scales and keeps them apart like the electrified pith-balls. This is the aeriel house of the static charge, and as long as it floats in the cold upper regions of cloud space remains as visible frozen vapor or clouds, and a condenser of electricity, but when the cloud sinks to the level of the melting strata, then these electrified laminæ become dissolved in rain, and the static charge, turned out of doors as it were, collects in force and like an angry god darts to earth, the nearest place offering a home, to be returned by silent dissipation, by vegetation, mountain peaks, and other prominent points on the earth's surface, in the line of the lines of force pervading the earth's surface and ramifying into space through every elevated conductor large and small.—*Electric Light and Power.*

LIGHTING A COAL FIRE.—The phosphorus on the match inflames at the low temperature of 150 degrees Fahrenheit, and mere friction ignites it. In burning it combines with the oxygen of the air and gives out heat enough to raise the sulphur on the match to the ignition point of 500 degrees. This combines with more oxygen and gives out sufficient heat to raise the temperature of the wood in the match to 800 degrees, at which point it combines with enough oxygen to give out a temperature of 1000 degrees, which raises the coal to the temperature required for ignition and the latter takes on more oxygen, rising to the temperature of 3000 degrees or more, according to circumstances. The ignition of the coal is the last in a series of progressive steps, each increasing in temperature, but the oxygen supplied at each stage of the process is of the same initial temperature, and no boiler furnace has ever been built in which hot air was proved to increase the intensity of the combustion. The idea of hot air in this case has always been traced to the seemingly similar application in the hot-air blast furnace. There, however, the case is totally different. The iron lies among the coal, and the entering cold air before it has combined with the carbon chills the iron, thus rendering more coal necessary than if the iron had been heated. If the air could combine with the coal before it reaches the iron, the temperature of the air would be a matter of indifference.—*The Safety Valve.*

SCIENTIFIC OBSERVATIONS IN ALASKA.—Messrs. Turner and McGrath, who went up to Alaska on the steamer St. Paul for surveying and scientific observations, have been heard from. Mr. McGrath left the steamer at Fort Yukon, while Mr. Turner went up to the Porcupine river. Both, in their letters, speak very enthusiastically of a satisfactory series of magnetic observations, and also of experiments with the tide-gauge which was daily read. At Fort Yukon, while awaiting the return of the steamer from Porcupine river, McGrath made a series of magnetic observations, obtaining, through opportune breaks in the clouds, several sets for time and latitude. In his private letters he speaks enthusiastically of the rapidly-changing and highly-diversified scenery of the country and of the strikingly-brilliant displays of the aurora borealis, accompanied by a sound as of the approach of a flock of geese. He remained at Fort Yukon, of which hardly a vestige remains, until Aug. 12th, when he moved up the Yukon river. He was last heard from on Aug. 16th, and had not yet reached his place of camp for the winter.

CAUSE OF OUR WARM SPELLS.—The editor of the *Call* query column says in regard to this phenomenon: The explanation is offered that to the area of high or low barometer to the north and northeast of San Francisco are due the warm or cool spells observed here. With a high temperature in this area, the air will naturally flow from the land rather than from the cooler sea, accounting for the corresponding warm periods here. There is as much foundation for the saying that there are never more than three days of warm weather in San Francisco as there is in the belief current in the East in places that if it rains on one Sunday in one month a succession of storms will be noted for every Sunday in that month. It is true, however, that these periods of high temperature in the areas about San Francisco last from two to five days (the hot spell last week four days), but the general average period of such changes will be found to be about three days, giving foundation for the saying.

THE SMOKE AND WORK OF AN EXPLOSION.—A fact of some interest in connection with the recent explosion at Antwerp is that an instantaneous photograph of the gigantic column of solid-looking smoke which arose from the burned gunpowder was secured, the photographer being a little more than a mile away. The column had an approximate hight of 3937 feet, and the greatest width of its head 1739 feet. Officers of the Belgium engineers estimate that 79 tons of powder, in addition to what was in the cartridges, must have exploded at once, and the force exerted was sufficient to excavate a hole in the ground about 50 yards long, 40 wide and 6 deep, removing some 36,000 cubic feet, or 1900 tons, of solid earth. No less than 95 persons, it will be recollected, were killed and 62 injured.

AMERICA'S VASTNESS.—Somebody with a mathematical propensity figures out that the aggregate territorial extent of the nations represented by visitors of the Pan-American Congress falls but little short of twelve millions of square miles—more than three times the area of all Europe, and but little less than one-fourth part of the globe—while in respect to the power of producing the articles which are essential to human life and those which minister to life's luxury, they constitute even a larger proportion of the entire world. These great possessions to-day have an aggregate population approaching 120,000,000, but if peopled as densely as the average of Europe, the total number would exceed 1,000,000,000.

IMPROVEMENT IN EYE-GLASSES.—A patent has been granted to Prof. John A. Brashear of Pittsburg, Penn., for what he calls astigmatic eye-pieces for optical instruments. Persons often have a peculiar condition of the eye by reason of which objects are seen in a distorted form, and these new eye-pieces are designed to correct such defect.

GOOD HEALTH.

The Ocean Cure.

The philosophy of the ocean cure and the advantages of a sea voyage for invalids is well set forth in the following paragraphs which we copy from an exchange:

One of the most thorough and complete "changes of air" is for a dweller inland to take a voyage on the open sea, and I now pass on to notice briefly the ocean cure. In the first place, it may be well to mention the advantages of a sea voyage, as they are generally stated. They are:

1. Perfect rest and quiet, and complete removal from and change of ordinary occupation and way of life; a very thorough change of scene, and perfect and enforced rest from both mental and physical labor.

2. The life in the open air and the great amount of sunshine to be enjoyed; it is quite possible, under favorable circumstances, to pass 15 hours daily in the open air; and whenever it is possible the traveler by sea is certain to endeavor to escape from the close and sometimes unpleasant atmosphere of a small cabin, into the pure air to be found on deck.

3. The great purity of the air at sea, and its entire freedom from organic dust and other impurities. In this respect it has an advantage over the air of an open country, for the latter is apt to contain the pollen of grasses and other plants, which in some persons excites hay fever and asthma. The air of the cabins may, of course, be contaminated, but the air of the open sea is probably the purest to be found anywhere.

4. The presence in the sea air of a large amount of ozone, as well as particles of saline matter, more particularly in stormy weather, from the sea spray, and these may exercise a beneficial effect in certain throat and pulmonary affections on the respiratory mucous membrane.

5. The great equability of the temperature at sea. This refers chiefly to the daily variations, which rarely exceed four or five degrees F. It must be noted that in a long sea voyage very considerable variations of temperature are encountered, and in a swift steamer the transitions are somewhat sudden.

6. The great humidity of the atmosphere and the high barometric pressure, which are considered to exercise a useful sedative influence on certain constitutions. It is said that the temperature of the body averages one degree F. less on account of this sedative effect. The exhilarating and tonic effect of rapid motion through the air; for by the continuous progress of the ship the sea breezes are constantly blowing over it, and the passengers are borne through the rapidly moving air without any exertion of their own. The influence of these currents of air on the surface of the body is, no doubt, important, acting as a stimulant and a tonic, increasing evaporation from the skin and imparting tone to the superficial bloodvessels.

TAKE THE UPPER BERTH.—Everybody, said an old Pullman sleeping-car conductor to a Chicago *Tribune* reporter, who wants a berth in a sleeper wants the lower berth. I have been in the employ of the company for 14 years, and I have never yet had an application for an upper berth. Of course, the upper berth is not so easy of access as the lower, but if you don't mind climbing to the upper berth, you will at once admit, after the night is over, that it is the more comfortable of the two. The ventilation is better, and you are not so close to the rumbling noise. You are more private than you are in a lower berth, and in case of accident you have a chance of coming out on top. In hot weather the upper berth is cooler than the lower. The lower berth, as you know, is made up from the cushioned seats, which are of warm material. I have never known a man to fall out of an upper berth. I think if the company would make a difference of a half dollar in favor of the upper berth, it would soon be in demand. But I believe the Pullman company never makes any difference in the charges.

EFFECTS OF ALCOHOL ON THE HUMAN SYSTEM. An English investigation, just completed, puts in tangible form the effect of the use of alcohol, from observations covering 4234 cases in all walks of life. This report shows that, with men over 25, the intemperate use of alcohol cuts off ten years from life; those who never drink to excess, or use no liquor, living on the average ten years longer than those who do. Indulgence, if carried to excess, doubles diseases of the liver, quadruples those of the kidneys, and greatly increases the number of deaths from pneumonia, pleurisy and epilepsy.

THE DIFFERENCE BETWEEN MEASLES AND SMALLPOX.—At the outset of a popular eruption it is often difficult to decide whether the case is one of measles or of smallpox. M. Grisol's method of diagnosis is as follows (*Medical Times*): If, upon stretching a portion of the skin, the papule becomes impalpable to the touch, the eruption is caused by measles; if, on the contrary, the papule is still felt when the skin is drawn out, the eruption is the result of smallpox.

SORE THROAT.—Few ailments are more common than sore throats, yet they are largely preventable, that is, they seldom come to one in vigorous health, except as the result of some violation of physical law. The more simple form of sore throat is commonly due to exposure in inclement weather, and often, indirectly, to a disordered stomach; in fact, it is not infrequently due to this cause alone. The person says he has taken cold, and wonders how he could have done so, while the truth is he has not taken cold at all. The stomach, œsophagus, nose, etc., are lined with mucuous membrane, continuous through this whole region, and the irritation begun in the stomach is propagated over the whole mucous surface. In all such cases the seat of the trouble is in the stomach, and accordingly the efforts to cure, whether by medicine, by diet or by treatment, should be directed to that organ.

AN EFFECTIVE REMEDY FOR EPILEPSY.—Dr. Grubert recently read a paper before the Paris Academy on a new and effectual remedy for epilepsy. Ten years' experience had convinced him that a considerable number of severe epilepsies may be certainly cured by bromide of gold, in the dose of eight to ten milligrammes per diem for adults, and three to six milligrammes for children in solution; the maximum daily dose being 12 milligrammes. This dose almost always produced severe headache. By lessening the dose a point of complete tolerance may be reached, which includes all toxic effects.

USEFUL INFORMATION.

WHO OWNS THE COUNTRY?—This is the title of an article in the September issue of the *Forum*, by Mr. T. J. Shearman, which goes minutely and thoroughly into the question of the division of wealth in the United States. The results of Mr. Shearman's investigations, involving much statistical research, are most startling. Briefly stated, Mr. Shearman shows that there are 31,100 persons in the States, each owning over $500,000, whose fortunes aggregate $36,250,000,000, leaving to the other 64,969 000 persons who live in that country only $23,750,000,000 to divide among them. In other words, two-thirds of the country's wealth is in the hands of one two-thousandth part of its population. Forty-two years ago there was but one man in the United States worth as much as $5,000,000, but now there are 1600 persons whose possessions severally are equal to or greater than that. This concentration of wealth, to which the Civil war gave rise, and which railway building and speculation have accelerated, is, moreover, going on rapidly at the present time. Worse still, there seems to be no means at hand for checking it, as the success of the trusts and financial monopolies attest. But we may be sure that something will be attempted before long by the Americans to counteract the growing evil.

GAS AT FIVE CENTS PER THOUSAND.—It is said that a company is already in operation at Litchfield, Ill., which proposes to furnish gas for five cents per thousand. The gas will be manufactured from Lima, Ohio, oil—a very cheap oil, which is sold at one and a quarter cent per gallon at the well. The company has already eight miles of pipe laid. They claim they can afford to furnish gas for fuel or for light at five cents per thousand. One of the principal proprietors, Mr. O'Hara, says: "A plant with 12 retorts will cost about $5000, and will supply a town of 6000 inhabitants; it would produce 60,000 feet of illuminating gas daily and 13 times as much fuel gas; here are the figures—120 gallons of crude petroleum, $1.50; gas for operatives, 30 cents; one work man one day, $2; total $3 80—product 200,000 feet. The crude oil is introduced to the furnace direct from the tanks. Steam forces it into spray, and mingling, both absorb the elements from the air and a chemical degeneration commences that winds up in non-condensible, non-explosive gas. For intensity of heat the fuel gas excels. I have seen Swedish iron, which requires 4500°, made with it; and also crucible steel, not only made, but melted and burned up in a few minutes."

SIMPLE ENOUGH.—A manufacturer of some patent compound or other came into the laboratory of a chemist with a bottle containing an unwholesome-looking mixture. "I would give $50," he said, "to know what would make the water and oil in this emulsion separate." The chemist looked at it. "Very well," he said; "write your check, and for that price I am willing to tell you what will make the water and oil separate." The visitor hesitated a moment and then wrote his check for the sum named. The chemist carefully deposited it in his pocketbook, and then quietly dropped into the liquid a pinch of common salt. Instantly the water and oil separated, and whether the client was satisfied or not, he had got what he wanted and he had paid his own price for it.

"DELIRIUM FURIOSUM."—There was a time when people, even in this country, the birthplace of railways, were protesting against their introduction, predicting all kinds of evils that would follow in their wake. The most curious protest against railways, however, was that drawn up by the Royal College of Bavarian Doctors, recently discovered in the archives of the Nurnberg railway at Furth, the first German line constructed. It contains the following passage, pointing out the danger of the new system of travel: "Travel in carriages drawn by a locomotive ought to be forbidden in the interest of public health. The rapid movement cannot fail to produce among the passengers the mental affection known as *delirium furiosum*. Even if travelers are willing to incur this risk, the Government should at least protect the public. A single glance at a locomotive passing rapidly is sufficient to cause the same cerebral derangement; consequently it is absolutely necessary to build a fence ten feet in hight on each side of the railway." Times have slightly changed since that protest was issued. We wonder what those learned Bavarian wiseacres would say now to our underground or the American overhead railways?

PROFESSOR WINCHELL'S PASTE.—Prof. Alex. Winchell has a cement that will stick on anything. The recipe is as follows: Take two ounces of clear gum arabic, one ounce and a half of fine starch, and one-half ounce of white sugar. Pulverize the gum arabic, and dissolve it in as much water as the laundress would use for the quantity of starch indicated. Dissolve the starch and sugar in the gum solution. Then cook the mixture in a vessel suspended in boiling water, until the starch becomes clear. The cement should be as thick as tar, and kept so. It can be kept from spoiling by dropping in a lump of gum-camphor, or a little oil of cloves or sassafras. This cement is very strong indeed, and will stick perfectly to glazed surfaces, and is good to repair broken rocks, minerals or fossils.

PAPER FROM SAWDUST.—An important experiment has been made successfully at Ottawa, Ont. A mill has been established which makes paper pulp out of sawdust. It is now using all the product of one mill. The paper made wholly from sawdust is said to form an admirable sheathing that is fit for building after being tarred and dried. A better quality of paper is made by using one-fourth waste paper. The plant cost $15,000 and consists of American machinery. The mill has a capacity for converting about 12,000 tons of sawdust into pulp annually.

EXPERIENCED MEN WANTED.—The *Steamship*, a magazine published at Leith, Scotland, thinks that American mechanics and sailors need an infusion of a little English or Scotch blood to enable them to regain their footing upon the ocean. It says: "We may look forward to that country becoming our most powerful rival in the near future," and then adds: "All that will be required is the importation of some experienced men from this country to carry on the work." That will do for Johnny Bull.

STEAM FOR CLEANING MACHINERY.—For cleaning greasy machinery, steam has recently been emphatically commended. It is claimed that a steam hose attached to the boiler can be made to do better work in a few minutes than any one is able to do in hours of close application. The principal advantages of steam are that it will penetrate where an instrument will not enter, and where anything else would be ineffectual to accomplish the desired result.

THE FIRST STEAM ENGINE in this country was of the Newcomen type, and was built by Joseph Brown of Providence, R. I. It was in operation, pumping water from a Rhode Island mine in 1787. The cylinder was made of plate iron and was 2½ feet in diameter, and the valve between the cylinder and boiler was two feet in diameter. The engine raised seven hogsheads of water per minute, and the furnace consumed two cords of wood in 24 hours.

AN AMERICAN COAL OFFICE IN LONDON.—What is believed to be the first European office of an American coal firm has just been established in London by Percy Heiner & Son, Philadelphia. An office has been taken, and a man engaged to solicit orders for American coal. It is not expected that coal will be shipped to England, but contracts will be made to supply English steamers with coal at Atlantic seaboard points in this country.

IMITATION EBONY.—Wash any compact wood with a boiling decoction of logwood three or four times, allowing it to dry between each application. Then wash it with a solution of acetate of iron, which is made by dissolving iron filings in vinegar. This stain is very black, and penetrates to a considerable depth into the wood so that ordinary scratching or chipping does not show the original color.

STAMPING SHEET METAL has become quite a large industry, and rapid advance has been made in the heavy and intricate work accomplished. A company in Cleveland, Ohio, claims to be the only one which can put sheet metal into especially intricate shapes, such, for instance, as a cylinder and keep a uniform thickness in every part of the work.

ENGRAVING TOOLS.—Almost the hardness of the diamond is said to be given by German workmen to steel engraving tools. The tools are made white hot, plunged repeatedly into sealing wax until cold, and then just touched with oil of turpentine.

WE MAY ALL EARNESTLY PRAY that the prophecy of Victor Hugo shall be fulfilled, and speedily, "In the twentieth century war will be dead, the scaffold will be dead, but man will live."

ELECTRICITY.

The Electrical Interest.

The rapid increase and growing importance of the electrical business, in all its varied forms, has already placed it among the foremost industries of the age.

The claim is made that upward of $600,000,000 of capital is at the present time invested in the electrical industry in the United States. Of this vast sum, $200,000,000 is credited to the telegraph and telephone companies, $300,000,000 to the 60 electric railways in the country, the electric-light companies and the numerous factories, and $100,000,000 to the manufactories of electrical supplies, wire, cable and electrical appliances generally. In the words of the New York *Engineering and Mining Journal*, "before long the waves of the sea and the winds of heaven will be harnessed for the use of man in every part of this country. The field is limitless, and the reward of those who enter it will be great and constantly increasing."

There is always an element of danger in the manipulation of electricity that requires care and skill, and whatever measures tend to secure perfect safety and competent service should receive the approval of every citizen. The demand for intelligent employes is every day becoming greater, and skill and energy will soon command large compensation. To this end the study of electrical engineering is being fostered at so many of our American seats of learning that there can no longer be any doubt as to the adequacy of the supply of electrical engineers for the coming developments of the industry, or their proficiency in the various branches of knowledge pertaining to so vast and comprehensive a science. There is no other industry that calls more loudly for specially educated managers and operators. It is largely for this reason that European governments are stepping in to make special regulations for its conduct. In France the government has already assumed an arbitrary control of all telephones in the Republic, and it will not be long before definite regulations of all electrical interests will be placed under proper surveillance here as well as elsewhere.

ELECTRICITY'S WONDERFUL GRIP.—The impossibility to let go which has been noticed so frequently in accidents from accidentally grasping live electric-light wires has recently been utilized in an experiment on the Philadelphia & Reading railroad in increasing the tractive-power of locomotive engines. The apparatus consists of a small dynamo and engine mounted upon the locomotive and furnishing an electric current, which is passed forward to the rear driving-wheels through that portion of the track rails lying between them. The passage of the current into the wheels and back causes an increased friction between the wheels and the rails, which is claimed to be far superior to that obtained by sanding the tracks, and enables the locomotive to draw a much heavier train, without regard to the condition of the track, than is at present possible. The current used is what is termed a low-tension current, and the increased traction obtained is under complete control by the engineer.

PROFIT IN MOTOR WORK.—The question, "What profit is derived from selling current for operating electric motors?" was recently put by the *Electrical World* to the superintendent of a well-known electric light and power-station furnishing current to about 125 horse-power in small motors. His answer was 38 per cent net profit on the original investment. Part of his daily expense account for operating the motors only is made as follows: Coal, $9; water, $1.20; waste and oil, 10 cents; sundries, $3; labor, two men, $4. It is evident that the profit lies largely in the fact that the motors are numerous and small. The same quantity of current supplied to, say, large motors of 30 horse-power each, would not yield any such return. But even then there would be a much better margin than is suspected by those who have not yet looked into motor problems or noted how remarkably the varying call for current practically doubles the capacity of the plant for motive-power purposes.

AN ELECTRIC LOCOMOTIVE.—A New York electrician is now engaged in the construction of an electric locomotive to run on regular tracks from storage batteries. The ordinary rotary type of electric motor will not be employed. Suction magnets are to be located on either side of the piston, and the current will be supplied from storage batteries in the fire-box. The locomotive is smaller than the usual type, and has driving-wheels of less diameter. The question of the economical utilization of fuel by means of storage batteries is one that has not yet been determined, but it may be possible to generate electricity by means of large compound engines, with a final loss at the motor not much greater than that which is found in that great wasteful gormandizer of coal, the steam locomotive.

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Passing Events.

The National Silver Convention which meets at St. Louis on the 26th inst., will doubtless influence Congress to favorable legislation on silver. By increasing the value of silver, hundreds of mines, now barely making expenses, would become profitable. The San Francisco Stock Exchange has appointed Homer King as a delegate.

A convention of American ore-producers, smelters, refiners, dealers and transporters of lead will meet at Salt Lake, Utah, on Nov. 20th, to decide on ways and means to gain by united action the protection of the great lead-mining industry, withheld from it by the recent ruling of the Treasury Department.

The United States Engineers who are investigating the debris question in this State are obtaining correct descriptions of the placer claims of the State, so as to compile such details as may be useful in their investigations. Among other things they are trying to find out the amount of auriferous material remaining unworked.

The Master in Chancery has decided against the North Bloomfield Gravel Mining Company, which was enjoined from dumping slickens, and then leased its property to the Omega Company. The decision is that the North Bloomfield Company is responsible for the action of the Omega Company, as lessee, and is in contempt. This was a test case and may materially affect mining operations. The penalty will be announced shortly.

Bullion Production and Silver.

The United States Director of the Mints annual report gives the bullion product of the world as follows: Gold, $105,994,150; silver, commercial value, $103,556,000—coining value, $142,439,150. Of the above this country produced gold, $33,175,000, and silver, commercial value, $43,000,000—coining value, $59,195,000. This shows that the United States, which is virtually this coast, produced about two-fifths of the total of the world's output. The Director of the Mint reports for the past fiscal year the coinage in this country as follows: Gold coins, in value, $25,543,910; silver dollars, $33,793,860; subsidiary silver, $721,686, and minor coins, $906,473. Total, $60,965,929. In addition to this, gold valued at $22,241,121, and silver bars, valued at $6,709,246, were manufactured. The profit of the coinage of silver dollars and subsidiary coin was $9,403,049. The total coinage of silver under the Bland Act up to the first of the present month was $343,638. Gold imports during the year amounted to $10,372,145 and exports $60,034,246. Silver imports amounted to $24,682,380 and exports $36,716,783. These figures show a loss to the United States of gold, $49,661,101; silver, $12,034,403. The director estimates the consumption of gold and silver in the United States in industrial arts for the fiscal year to have been: Gold, $16,000,000; silver, $8,000,000.

A close analysis of the above shows that bimetallists are pursuing the proper course when they demand the remonetizing of silver, and our country, more than any one nation, is directly interested in the promotion of this desirable result, for out of a total world's production the United States is credited with two-fifths. That this country is beginning to assert its rightful position on the metal is witnessed in the market value of silver bullion, for instead of having England dictating the price, we have, through able financiers, become the autocrats. Probably to San Francisco rightly belongs the credit for this successful move, as our city has for several months past ruled the market, and by consistently advancing prices forced the foreign markets to follow.

Touching on the silver question, we give the following from the New York *Financial News*, October 30th: "The feeling is growing rapidly that if the Secretary of the Treasury does not conclude to increase the coinage before Congress meets, that that body will probably instruct the Secretary to increase the coinage to the maximum amount, $4,000,000 per month. The silver element in Congress, by the recent admission of the four new States, has been strengthened by 12 votes in the House and Senate, and the West, with the assistance of the South, will have a sufficiently large vote to adopt the necessary resolution of instruction. The dollar of our daddies is with us to stay."

Windlassing.

Working a hand-windlass over a 50-foot shaft is no soft job; working one when the shaft is 100 feet deep is a very tough job; and when the shaft gets deeper than that it is time to quit the windlass altogether and hunt up somebody with money, who will risk it on a hoist.

All over the mining regions of the Pacific Coast hundreds of men are slowly testing their claims and hoisting their rock with windlasses, grinding and sweating at the crank and wishing for the day to come when they can get a horse-whim or steam hoist. It is mighty slow, tedious and steady labor. It is the men who are doing this kind of work who want to see capital come into the camps. Before they can make mines out of their claims and develop them with any degree of satisfaction, they must stop hoisting by hand. But horse and steam hoists take coin, and prospectors with undeveloped claims are not apt to have too much of this to spare; so they continue to develop their muscles and their claims, and hope for the good time to come. Once a good hoist is in place it seems as if 10 times as much work is being done. It takes backbone to work a windlass, but the backbone of capital is better on a hoisting proposition every time.

THE first practical result of the visit of the Governor of Canada to British Columbia has materialized in the formation of a large mining company by the members of the party.

Oregon Mining Districts.

Mr. C. B. Small, editor of the *Democrat* of Baker City, Oregon, made us a call this week, and from him it is learned that mining affairs in the districts around that point are quite active.

At Cornucopia, the Oregon Gold M. Co. has been operating the Red Jacket for the past year, and transporting the ores by wagon, but they have now built a $30,000 wire-rope tramway. Some 60 men are employed and the mill reduces 45 tons of ore per day. The concentrates have been shipped, but arrangements are being made to reduce them at the mill. The Last Chance has been worked for about five years, and has a four-foot ledge averaging about $30 per ton.

The Simmons group consists of the following claims: Pine Creek, Buckeye, Empire, Chessmate and Keystone; they are about two miles north of Cornucopia, and are owned by Messrs. Simmons, Williams, Lichtenthaler and Williams. This is the best developed property in Pine Creek, except the Red Jacket of the Oregon Co. On the Pine Creek claim the ore averages $20 free gold with rich sulphurets. The best developed property is the Buckeye. This has two veins, one 4½ and the other 2 feet wide, and the ore will assay $60 per ton free gold. Other good properties in the camp are the Union, Companion, Forest Queen, Red Boy, Maverick, Norway, Moonshine, Estella, May Queen, Wild Irishman, Queen of the West, Mayflower, White Swan, Crystallite, Wongee, and Glee Club. There is no custom mill in the camp and the ores are shipped East. It costs $50 to ship and work the ore in Denver.

Cracker Creek district is about 35 miles southwest of Baker City. The Eureka and Excelsior is the most prominent claim, and was sold to Eastern people not long since for a reported price of $1,000,000. They are now putting up a large milling plant, intending to start with 20 stamps and add 20 more. A large number of other properties are being developed and give promise of becoming good mines.

Granite Creek is near Cracker Creek and is an old placer district which is now showing up well in quartz.

Pocahontas district is nine miles west of Baker City; placer mining has been carried on there since the early "60s." The Big Aleck, under the management of Capt. James Baxter, is the principal claim. Their 3½ foot Huntington mill is found to be too small, and other reducing machinery is being added. The mine is really a big deposit of soft material, which is quarried out. It is from 100 to 200 feet wide and lies in layers about two inches thick, one above the other. In some places these layers form a deposit 10 to 15 feet thick. The material runs all the way from $3 to $100 per ton and there is an abundance of it, enough to keep large reduction works running for years to come. The mine is owned by the White Star Mining Co., composed mainly of Boston people.

The Baiseley mine is about twelve miles west of Baker City on Pine Creek. This is one of the best developed and richest mines in that part of the country. They are now putting up a mill.

Rock Creek district is a promising camp. All the properties are being worked and some mills will be put up next summer. They have many good prospects in the camp, but there is no machinery there yet.

The Robinsonville district properties are showing up well and the owners have great confidence in them. This is close to Granite Creek district.

The Nelson placer mine, seven miles west of Baker City, is one of the richest placers on the coast and was sold for $300,000 about a year ago. The final clean-up this summer was the largest ever made. It is worked by hydraulicking.

The general prospects of mining in Oregon are, in the opinion of Mr. Small, improving very rapidly. The mines are attracting Eastern capital, and as capital has been badly needed its advent in some of the camps has raised the hopes of others.

Baker City is the center of supplies for a large mining section and the place is growing rapidly, there being now a population of about 4000. There is one $30,000 brick block, and a $30,000 school-house, while a three-story brick hotel costing $40,000 is being built. A new bank is being built and a franchise has been granted for a street-car line. There are gas works and a contract has been let to extend the water supply over the whole town. The main interests of the people are mining, agriculture and stock-raising.

Delinquent Co-Owners.

It is a wise provision of our mining laws which simplifies the method of getting rid of partners in mining claims who do not contribute their share of the assessment work in either money or labor. In the old days it was hard to define abandonment of a claim, and difficult to get rid of partners who neglected to do their work. They could at any time throw a cloud over the title and prevent a sale. Now, however, delinquent co-owners can be given legal notice in a newspaper without personal service of any papers. It is true, the notices must be published three months before other action can be taken, but proof of the publication will prevent any complications of title in case the delinquent tries to make any fuss.

Miners who do their assessment work for the year in the various districts, and who are associated with co-owners who neglect or refuse to contribute their proportion, should give legal notice in the nearest paper, and do it immediately, so that the delinquent can be got rid of at once, and not be liable to interfere in case of a strike in the mine or a prospective sale.

Crushing and Screening Ore.

On page 355 is an engraving showing the general arrangement of one set of crushing and screening apparatus in the new dressing works of the St. Joseph Lead Company. There are 10 such in the new mill, each crushing about 80 tons in 24 hours, consisting of a 7x15 Blake crusher, lever pattern, with corrugated jaws; a pair of Cornish rolls, 14 inches by 30, with chilled tires; a revolving screen, 3 feet in diameter by 8 feet long, with perforated steel plates, a bucket elevator for the material coarser than 6 mm., and a centrifugal pump.

The jaw-crushers are set to crush about 38 mm. or 1½ inches, and the rolls to crush about 16 mm. or ⅝ inch. Of the material passing through the rolls at any time, about one-third is too coarse to pass through the screens; consequently the ore passes through the rolls one and one-half times. The crushers are fed by hand, one man to each machine. The feed must be regular, as on this depends the amount of material going over the jigs, tables, etc., which must be kept uniform.

THE report of Superintendent Kincaid submitted at the annual meeting of the Occidental Mining Company shows that from August 1st, when the new 20-stamp mill was accepted, to November 1st, the mill worked 4389 tons of ore of the average assay value of $18.37 per ton, from which bullion was extracted of the assay value of $33,985.84, and concentrates were produced of the assay value of $33,071.90, aggregating $67,057.74, of which $18,412.92 was in gold and $48,644.82 was in silver. The yield was 83 per cent of the assay value of the ore.

UTAH MINES.—In his report, the Governor of Utah says: The mining industry has been generally prosperous. The miners believe that there would be a great increase in the mineral products were it not for the erroneous construction of the law relating to lead ores by the Treasury Department. The product of the mines was as follows: Copper, 2,886,816 pounds; unrefined lead, 44,566,167 pounds; fine silver, 6,178,855 ounces; fine gold, 13,886 ounces.

ALASKAN GOLD.—The steamer Corona from Alaska brought down $50,000 worth of gold from the Treadwell mine, $12,000 from the Cassiar, and about $13,000 from other claims. The discovery by an Indian of a shallow creek said to be rich in gold, in Omineca district, is causing old miners to flock there.

ARTESIAN WELLS.—The article on "Artesian Wells in California," printed on page 357, was originally prepared for the State Grange, and read by the author at the late session in Sacramento.

NAME WANTED.—If the person who mailed us a postal note without any letter from Auburn, on the 7th inst., will send us his name, he will receive proper credit on our books.

Amador County.

[Written for the Press by RICHARD WERT.]

This county, which took such a prominent place at the State Fair, taking the capital prize for the best general exhibit, is one of the smallest in the State. It is about 70 miles long from east to west, with a varying width of from four to 20 miles. Almost every condition of climate to be found in California is to be met with within its borders, from the semi-tropic temperature of the valley to the ever-present snows of the summit of the Sierras. Its population at the present time is estimated at 13,000, which is confined to the western portion of the county, embracing an altitude of from 200 to 2000 feet above sea level. This populated foothill region possesses a climate which cannot be surpassed for geniality and healthfulness. There is a buoyancy and lightness in the air of the foothills which is not to be found elsewhere, and which in time will make them the health resort of the Pacific Coast. The mercury seldom rises above 100 degrees in summer, and as rarely falls below the freezing point in winter. Indeed, its sanitary advantages are recognized by many capitalists of the East who have invested in mines, who regularly repair there every winter to avoid the rigors of the Atlantic States.

At the recent State Fair the county made by far the best mineral exhibit. Back of the minerals was a large painting representing the topography of the county, with the location of the various mines from which ores were displayed. It is stated that no finer exhibit of gold ores was ever made in this State. Aside from the ores, there were many fine nuggets of gold shown. The cut given herewith is a photo-facsimile of the exhibit at the fair.



EXHIBIT OF MINERALS AND ORES BY AMADOR COUNTY AT THE STATE FAIR AT SACRAMENTO.

Resources.

Amador is principally a mining county. Gold mining is its main industry. It has been the chief occupation of its people from its earliest settlement to the present, and will undoubtedly continue to be for many years to come. In the early days the placer mines contributed most of the gold supply, but this class of mining has long since been superseded by quartz mining. Amador ranks second among the counties of California in gold production. Since her organization her yield of gold is roughly estimated at from $60,000,000 to $80,000,000. The main quartz belt, commonly called the "mother lode," traverses the county north and south a distance of 20 miles, at a mean altitude above sea level of about 1000 feet. Unlike the generality of mining regions, this section is as pleasant and desirable a spot for human habitation as it is possible to imagine. It is a common thing for an orchard to be yielding its wealth of fruit on the surface while underground workings are surrendering their metallic treasures. The mother lode consists of a succession of ore deposits or chimneys of varying size and richness. The principal mines at present working, and the number of stamps and men employed when in full operation, are as follows:

	No. men.	No. stamps.
Plymouth Consolidated	200	160
Gover	40	20
Bunker Hill	80	40
Keystone	100	40
South Spring Hill	70	30
Talisman	10	10
Wildman	30	20
Kennedy	80	40
Zeile	110	40
Iowa	10	10

The Plymouth Consolidated has proved a bonanza to its stockholders. For many years it yielded from $75,000 to $100,000 per month. It has been worked to a depth of 1700 feet, the ore averaging from $7 to $8 per ton.

The Gover has been explored to a depth of 1000 feet. Ore running up into hundreds of dollars per ton is frequently met with.

The Keystone at Amador City is the oldest producing mine in the county. For 30 years it has held its place as a steady yielder, its output varying from $20,000 to $40,000 monthly. It has been developed to a depth of 1300 feet, and the quartz has averaged from $5 to $25 per ton at different periods of its history. The gross yield is over $10,000,000.

The South Spring Hill is a comparatively new mine, but stands to day at the head of the list in bullion production. It is down less than 800 feet, yields about $20,000 per month, and has a long career of activity before it.

The Wildman at Sutter creek is an old property, abandoned for 20 years, and recently restored to active operations. The history of this claim shows it became a mine and was given up in the early days of quartz mining as a non-remunerative property. Over 20 years back a shaft was sunk 600 feet, and drifts run in several directions, and the outlook was not considered encouraging, so the mine was abandoned. Two years ago Eastern capitalists purchased it, and under the supervision of John Tregloan, a thorough practical miner, the property was reopened. Good hoisting machinery has been erected, and a 20-stamp mill equipped with the most approved gold-saving appliances has been built and started, and the money necessary to pay for these improvements has been taken from the mine. It is now regarded as one of the most substantial and prosperous properties on the mineral belt. The ore yields from $6 to $8 per ton, which leaves a handsome margin of profit. There are scores of claims on the same belt, now idle, which are just as likely to develop into rich productive mines as the Wildman was considered to be at the date of its reopening.

Another instance is the Kennedy mine near Jackson, which has recently been opened by San Francisco capitalists, and is now fully equipped with all the modern improvements and gold-saving appliances, and will, without doubt, in the near future, return many dividends to the fortunate shareholders.

The Zeile, at Jackson, furnishes an illustration of what can be done with a low-grade proposition. It is, perhaps, the lowest grade ore worked in the county, if not in the State. In free gold and sulphurets the yield does not exceed $3 or $4 per ton. There is an immense ledge—30 to 40 feet wide in places—and a 40 stamp mill crushes from 130 to 140 tons per day. The quartz is remarkably even in its yield. By an economical management the property has been successfully worked for the past ten years, and will probably continue to run for a generation to come. It is not a great many years ago that rock was looked upon as worthless for mining purposes if it did not give up from $10 to $12 per ton, and many prospects were abandoned because they did not come up to this standard. Now such quartz is looked upon as high-grade rock. The average of all the paying mines now in operation is from $6 to $7 per ton, and such figures leave fully 50 per cent profit.

Besides these there are several mines with excellent prospects of turning out paying properties which are idle, owing to litigation or want of capital to place them on a working basis. Among them may be mentioned the Loyal Lead, 10 stamps; Lincoln, 40 stamps Mahoney, 40; Moore, 10 stamps; Potosi, 10 stamps; Amador Queen, 20 stamps; Mammoth, 10 stamps. All of these have in years past yielded gold in paying quantities, and most of them will surely take their place among the active mines of the future.

The development of this great mining-field is steadily going on. At the present time the New London Company, whose property is near Plymouth, is building a fine 40 stamp mill; the South Cosmopolitan, owned by Massachusetts capitalists and located a couple of miles south of the New London, is putting up a 30-stamp mill; the Amador gold mine, near Jackson, has a 60-stamp mill nearly completed. All these mills are warranted by underground developments as far as anything short of actual milling tests can justify them.

There is still an unlimited field for mining development. Not one-hundredth part of the mother lode has been adequately prospected.

Outside of this lode there are many fields for mining enterprise. At Volcano, a cement-gravel claim has lately been opened with flattering results, the yield far exceeding per ton any quartz mine in the county. There is a vast channel of this gold-bearing cement, and other companies are preparing to commence operations thereon.

Other Mineral Resources.

In addition to gold, Amador is rich in other minerals. In Ione and Jackson valleys coal is found in large quantities. The coal is somewhat inferior in quality, but the bed has been prospected only 200 feet deep.

Fine sandstone for building purposes is found near Lancha Plana, of which stone the new Sacramento bank building has just been constructed. Marble suitable for mantel-pieces, monuments and other purposes is obtained near Plymouth and Volcano. The Newton copper mine between Ione and Jackson has been profitably worked for years. Iron ore exists in abundance. Splendid granite for building is found a few miles east of Jackson.

There are located at Sutter Creek two large machine-shops and foundry, Knight & Co. and Donnelly & Howard, who manufacture all kinds of mining machinery, water-wheels, etc.

Voorhies & Barney have chlorination works; one located at Sutter Creek and one at Drytown, and they treat ore from nearly all the mines in the county. The capacity of both works is 7½ tons per day, and the yearly production of gold is nearly $250,000. Prompt and correct returns have gained for these gentlemen an enviable reputation in their business.

Another great advantage this county possesses is the magnificent water-power afforded principally by the Blue Lake Water Co., which has a large canal running nearly the entire length of the county, affording power for nearly all the mines on the mother lode both for hoisting works and the running of mills, and by a system of reservoirs in the mountains are able to store water in the winter to last the entire summer through, as the last season was a very dry one and the company had plenty of water for all.

Agriculture.

The agricultural resources of the county are of a high order. The display of fruits, cereals and vegetables at the State Fair was a surprise to the rest of the State, as the general idea on the outside was that Amador was a mining section almost exclusively. Ione and Jackson valleys will compare in fertility of soil and range of production with any portion of the State. Also for several miles east and west of the main mineral belt, the soil is very productive for all kinds of fruit and grain. A large farming community exists in the very heart of the mining region, and a ready market is found for their produce.

Much of the soil is specially adapted to grapes, which are a very profitable crop, whether for table or wine purposes. Wine grapes thrive without irrigation. Indeed, the finest wines are made from grapes grown without irrigation throughout the entire summer, and on upland soil. A few years ago a vineyard was planted a few miles east of Jackson, on a slaty bedrock soil. Blasting had to be resorted to in preparing holes to plant the cuttings. Many laughed at the idea of vines growing, much less thriving, under such conditions. But it has proved, without the least effort at irrigation, one of the thriftest and healthiest vineyards in the county, and bore an excellent crop the present season.

Land is comparatively cheap. In the valleys it ranges from $20 to $50 per acre. In the mining section and above, there is plenty of land to be had from $8 to $20 per acre, according to improvements. In the eastern part of the county there are vast forests of pine and spruce—as fine timber as can be seen anywhere—comparatively untouched.

Its local government, in efficiency and economy, will bear comparison with that of any county in the State. Amador is practically out of debt. The last outstanding interest-bearing warrants are expected to be redeemed by next year's levy. Last year the tax rate for State and county purposes was $1.50 on $100. Her educational and social privileges are all that could be desired.

The principal towns are: Jackson, the county seat, population 2500; Sutter Creek, 1500; Amador City, 1000; Plymouth, 1200; Drytown, 400: all on the mining belt; Ione City in the western part of the county, the terminus of the Amador Branch railroad, with a population of 1000. This town has also been selected by Act of the Legislature for the location of the Preston Reform School for juvenile criminals.

The great need of the county is railroad extension to the populous mining section. This would undoubtedly give an impetus to all branches of business, and enable this favored county to vie with any portion of the State in the inducements held out to the homeseeker.

Academy of Sciences.

At the meeting of the California Academy of Sciences on Monday evening, F. Lambertigni, the Italian Consul for this city, who has recently returned from Italy, gave an account of the condition of affairs there and the improvements going on.

T. S. Brandegee, a member of the Academy, read a paper on the flora of Baja California. The document was almost entirely of a technical character of interest to expert botanists.

Mr. Brandegee arrived in Magdelena Bay, Lower California, on January 11th of the present year, from which time until the following May he dedicated himself entirely to making a collection of plants and flowers. Though the country is in many places arid and sterile, it has a great variety of plants and some beautiful flowers. The different forms of cactus are met with in almost every part of the territory in endless variety, while fine woods are found in some sections. Mr. Brandegee found the country quite thinly populated, sometimes journeying for two weeks at a time without encountering a human habitation. When he had concluded his researches he returned to this city with his collection, which is believed to contain the largest number of specimens of Lower California flora yet gathered.

In the discussion which followed the reading it was stated that the annual output of the orchilla from Lower California was valued at about $300,000. The orchilla is a lichen much used in the manufacture of the finest dyes. It is found on the coast of Zanzibar, but the conditions for gathering it there for commercial export are most unfavorable. Its presence on the peninsula of Lower California was discovered some years since by an intelligent wanderer who had amassed a fortune by exporting this valuable lichen to London and other centers of industry.

LAST week's ore yield of the Comstock mines aggregated 3874 tons, divided as follows: Con. Cal. and Virginia, 2577 tons, assay value, $28.75 per ton; Yellow Jacket, 455 tons, assay value, $26.50; Occidental Con., $318 tons, assay value, $20 50; Justice, 214 tons, assay value, $26 50; Alta, 310 tons, assay value, $30 75. The total bullion yield of the above was about $95,000.

THE large granite base of the Stevens memorial statue has been placed in position in the Sacramento city plaza. The statue will be completed and dedicated on Thanksgiving Day. This monument is being erected by railroad employes to the memory of their late master mechanic, A. J. Stevens.

ONE HUNDRED AND FIVE pounds of gold, valued at $21,000, representing the yield from ore crushed in a hand-mortar in two weeks by three men, was brought to Nevada City last Saturday. It came from Chipp's Flat, near Alleghany City, Sierra county, the province of bonanzas.

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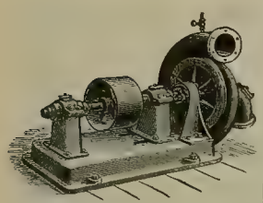
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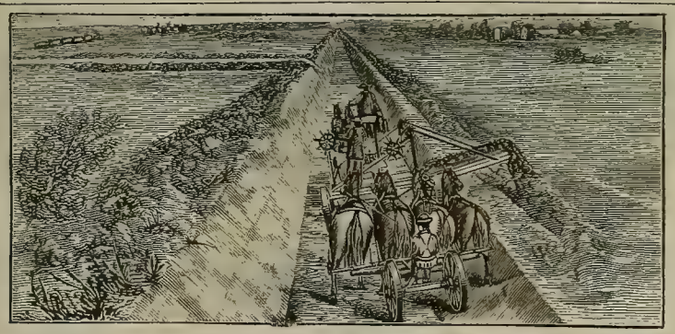
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Cuts Cooler and Freer
THAN ANY OTHER WHEEL IN THE MARKET.


Emery Vulcanite Wheel.

Adapted to Mechanical Purposes.



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BELTING and HOSE
—FOR—
Mining Purposes.
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The Tunnel Horse.

The tunnel horse (or mule) is an institution in mining, and very much more useful in the economies of civilization than the record-breaking trotters or runners of which we read so much in the papers. Yet he has not been immortalized in verse or any class of literature. He is not an equine aristocrat. He has no elegant stable and careful trainer like the horse used for speed only. The condition of his health is not telegraphed all over the country from time to time; and even if his virtues be many, there is seldom a possibility of their being handed down to posterity by descendants. Yet he fulfills his destiny with patience and perseverance. Mole-like he pursues his path in damp and darkness. Whatever intelligence and training he may have are entirely at his master's service and expended for his good. With a good grade out, his duties are lightened; but whether he works both ways or only hauls the empties in and follows the loaded cars out, he goes from mouth to face and from face to mouth day after day, in the ceaseless round of duty. Used to the splash of water, the thud of blasts and the roughness of his track, he patiently plods on, unmindful of the busy world without. The sunlight is not for him, since, if not kept inside a hundred feet or so, he is blindfolded when coming to the light of day while on duty.

A tunnel horse, well trained and experienced, is a most useful animal. His type is seen in all the well-developed camps of the coast, and, although of humble station, in many places they could do better without a superintendent than without him. It is his duty to carry away the rock from the face and often to supply the mill. He takes the men in and out, hauls timbers and supplies, and makes himself generally useful. He is intelligent, too, and while accustomed to the ordinary scenes and sounds of the mine, realizes anything unusual. We have in mind an old mule that had worked some years in a very long tunnel in one of the northeastern counties of this State. He had to haul the empties in and walk back without a load to a point a few hundred feet from the tunnel mouth. At this point the outcoming loaded cars were stopped, he was blindfolded, and then hauled the cars out and round a curve to the ore-hoppers of the mill, or to the waste-dump. The cars came to where he was stationed by gravity. He usually had to wait awhile at his station for his cars to come, and had never tried to come past that point unles blindfolded and driven. One day, before he had quite got back to his station, he heard the cars coming very fast, and evidently realizing that something was wrong, started on the dead run, passing his station and getting within 100 feet of the tunnel mouth when the cars overtook him. Just before they did, he suddenly stopped, squeezed himself up against the timbers as close as possible, and escaped with a skinned side. The cars had broken loose and run off loaded without any brakesman. A miner on the way out, on foot, witnessed the occurrence. That mule must have realized that those cars were coming too fast for his good, and he did his best to get out of their way, yet he was accustomed to their rattling every day as they came, with the grade, toward his station.

Sometimes the tunnel horse gets into mischief, especially if hungry, when his appetite will, as in the case of human beings, lead him into indiscretion. An instance occurred, only a week or so ago, when the barn of the Indian valley mine, Plumas county, this State, was burned, together with a horse and phaeton, some hay, grain, harness, saddles, etc. The mine is supplied with hydrants and hose, and the water was turned on in a very short time, but the whole building had burst into flames and the fire had gotten such a start that it was impossible to do more than protect the property near by. The theory of the fire's origin is that the tunnel horse, carrying a lighted candle at his breast, after coming out of the tunnel unattended, went to the barn, and finding the door open, walked in and up to the manger containing hay. His lighted candle started the hay burning, with the results stated. If he had been an ordinary horse, he would have stayed in the fire or run in where it was hotter, but, being a tunnel horse, he was too smart for this. When the fire was discovered, the tunnel horse was standing outside, not far from the door. The superintendent's driving horse, hitched to a phaeton, stood in a stall and was suffocated.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific States.

FOR WEEK ENDING OCT. 29, 1889.

413,642.—COMBINED PULVERIZER AND CULTIVATOR—G. W. Bassett, Lower Lake, Cal.

413,820.—CONCRETE-MIXING MACHINE—Chatain & Gilletti, S. F.

413,821.—WASHING MACHINE—Enos Churchill, Tulare, Cal.

413,712.—CORN-PLANTER—J. De Rose, S. F.

413,823.—FLOUR SIEVE AND SCALES—Adeline T. Evans, St. John, Cal.

413,938.—SOLDER-MELTING FURNACE—E. Hawes, Sacramento, Cal.

413,829.—OVERDRAW BRIDLE ATTACHMENT—P. L. Nash, Hollister, Cal.

413,830.—ROTARY STEAM PUMP—E. I. Nichols, S. F.

413,831.—FRUIT-PITTING MACHINE — E. I. Nichols, S. F.

413,804.—LIFTING JACK—E. I. Nichols, S. F.

414,119.—CONCENTRATOR—A. B. Paul, S. F.

413,732.—INSECTICIDE—J. Reeder, Fresno, Cal.

414,177.—PACKING-BOX—W. H. Snow, Oakland, Cal.

413,836.—CULTIVATOR — I. Sylvester, Colusa, Cal.

The following brief list by telegraph, for Nov. 6, will appear more complete on receipt of mail advices:

CALIFORNIA.—William Wainwright, S. F., lawn irrigator; Eugene Urbanic, S. F., ground-bone furnace; Wm. Tenyck and G. Green, Oakland, seal lock; Gustav F. W. Schultze, Alameda, coin-operated punching or striking machine; Thos. A. Pudan, Sacramento, plate or dish-washer; Edmond Pait, Berkeley, assignor of two fifths to B. C. Turner of S. F., coal-du-t feeder; Wilfred Page, Penn's Grove, two-wheeled vehicle; Milton W. Lipe, San Jose, wood-sawing machine; Wm. S. Herrington, S. F., miter-box; Wm. J. Gorham and M. A. Graham, S. F., pulley; Thomas R. Garnier, San Jose, ore-concentrator; Wm. C. and S. Freeman, Bidwell's Bar, animal gun; Ferdinand Espel, S. F., cable-car stopper; Alfred Dudden, Santa Barbara, door-spring; Edgar B. Badlam, S. F., device for supplying and measuring air for carburetors; John Bean, Los Gatos, pump; Charles E. Bigelow, S. F., truss.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable prices, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

FRUIT-PITTING MACHINE.—Emory I. Nichols, S. F., assignor to the Nichols Manufacturing Co. No. 413,831. Dated Oct. 29, 1889. The invention relates to that class of machines for extracting the pits or stones from the fruit in which a winged punch is employed which is brought in contact with the fruit, whereby the punch drives out the pit, while the wings thereof sever the fruit and lay it open; and the invention consists in a fixed bracket carrying the winged punch and a rotary wheel mounted on the fixed bracket and carrying sockets or seats for the fruit, so that by the rotation of the wheel the fruit is brought into contact with the fixed winged punch and its pit thereby driven out and its flesh out open. The object is to provide a fruit-pitting machine in which the operation is accompanied by a rotary motion, the advantages being greater convenience and more rapid operation than in those machines in which the winged punch has imparted to it a reciprocating movement against a fixed bed.

WASHING MACHINE.—Enos Churchill, Tulare, assignor of one-half to W. L. Morrow of San Luis Obispo. No. 413,821. Dated Oct. 29, 1889. This invention consists in a rocking or oscillating vessel having peculiarly constructed ends, whereby a chamber is formed at each end in which air is compressed by the rocking action of the vessel and the movement of its contents, the compressed air acting on and through said contents and driving it back, thus more effectually agitating it. The object is to provide a machine adapted for washing clothes or for churning cream, in which agitation of the material acted upon is effective in the case of washing, the water and suds being forcibly driven back through the clothes by the compressed air, and in the case of churning, the fatty globules being thoroughly broken up.

ROTARY STEAM PUMP.—Emory I. Nichols, S. F., assignor to the Nichols Manufacturing Co. No. 413,830. Dated Oct. 29, 1889. This is one of that class of rotary pumps in which the sliding pistons are successively projected into and withdrawn from the water space. It consists in a shell or casing having a steam inlet and a steam outlet, an annular rotary piston-carrier mounted within and having its periphery eccentric to the inner circumference of the shell, whereby on one side the contact of the two forms an abutment and on the other side a steam space, a fixed center within the annular piston-carrier, and having its periphery eccentric to the inner circumference of said carrier, whereby at one side it forms an abutment and at the other side a water space, said center having an inlet and outlet port, and sliding pistons mounted in the carrier and extending between the inner circumference of the shell and the periphery of the fixed center. The object of the invention is to provide a rotary pump adapted to be operated by steam, the whole machine being practically a combination of a rotary steam engine and a rotary pump, the former being the motive power of the latter.

LIFTING-JACK.—Emory I. Nichols, S. F., assignor to the Nichols Manufacturing Co. No. 413,864. Dated Oct. 29, 1889. The invention consists in the novel construction and arrangement of the hollow standard ratchet lifting bar mounted therein, vibrating operating lever, spring-controlled pawls carried thereby and stop-piece for releasing the pawls. The object is to provide a simple lifting-jack of that class in which a ratchet-bar is raised by the alternate engagement of opposing pawls carried by a vibrating lever.

OVERDRAW BRIDLE ATTACHMENT.—Potalba L. Nash, Hollister. No. 413,829. Dated Oct. 29, 1889. This is a check and overdraw for horses. It consists of a padded base or bridge supported upon the face of the horse below the eyes and having standards or posts upon each side extending outwardly from the horse's face, and provided with guides or runners through which the check-rein from the bit may pass, these reins leading backwardly through the terrets and being connected with the driving-rein. As many guides may be employed as may be found desirable to suit different horses which are to be trained.

COMBINED FLOUR-SIEVE AND SCALE.—Adeline T. Evans, St. John, Colusa Co. No. 413,823. Dated Oct. 29, 1889. This kitchen utensil consists in a combined flour-sieve and weighing scale, the object being to provide a simple utensil for readily weighing and sifting flour, and also for weighing other materials.

CONCRETE MIXING MACHINE.—Evariste Chatain and Secondo Gileti, S. F. No. 413,820. Dated October 29, 1889. This apparatus for mixing materials for the formation of concrete consists of a vertical tube with a receiving hopper at the upper end and a series of transversely-arranged swinging-chains by which the material is mixed as it falls from the top to the bottom of the tube.

CULTIVATOR.—Isaac Sylvester, Colusa, assignor of one-half to R. A. Gray. No. 413,836. Dated October 29, 1889. This is one of that class of cultivators known as a weed-cutter. It consists in a frame having a wheel on each side mounted upon an independent crank axle whereby the frame and the cutting blade which it carries may be raised and lowered, a cutting blade secured adjustably under the frame and carried by said frame at an angle extending from one of the forward corners to the rear corner diagonally opposite, and a rake attachment on the rear of the frame.

Thanksgiving Proclamation.

The following proclamation was issued by the President on the 1st inst.:

A highly favored people, mindful of their dependence on the bounty of Divine Providence, should seek a fitting occasion to testify their gratitude and ascribe praise to Him who is the author of their many blessings. It behooves them to look back with thankful hearts over the past year and bless God for His infinite mercy in vouchsafing to our land enduring peace, our people freedom from pestilence and famine, our husbandmen abundant harvests, and to them that labor recompense for their toil.

Now, therefore, I, Benjamin Harrison, President of the United States of America, do earnestly recommend Thursday, the 28th day of this present month of November, to be set apart as a day of national thanksgiving and prayer, and the people of our country, ceasing from the cares and labors of their working day, shall assemble in their respective places of worship and give thanks to God, who has prospered us on our way and made our paths the paths of peace, beseeching Him to bless the day to our present and future good, making it truly one of thanksgiving for each reunited home circle as for the nation at large.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. C. HOAG—San Francisco.
E. G. BAILEY—San Francisco.
M. D. SHRADER—Santa Clara and Santa Cruz Cos.
GEO. WILSON—Sacramento Co.
E. H. SCHAEFFLE—Calaveras Co.
DR. W. F. DRAKE—Sonora, Cal.
J. H. CROSSMAN—Inyo and San Bernardino Cos.
H. KELLEY—Modoc and Lassen Cos.
C. EDWARD ROBERTSON—Humboldt Co.
H. B. PARKER—Tehama and Shasta Cos.
FRANK S. CHAPIN—Sierra and Butte Cos.
H. G. PARSONS—Central California.
WM. H. HILLEARY—Oregon.
JUAN C. JENS—New York City.
E. E. DEMING—Oregon.
W. B. FROST—Monterey and San Luis Obispo Cos.

Michael McMahon, better known in Plumas and Sierra counties since 1851 as "Black Mac," died at the home of his only brother, near Ann Arbor, Mich., last month. The Plumas *National* says: Himself and nephew still own some claims near the Buckeye mine, this county, and quartz claims in Oregon. He acknowledged before his death that he had gold buried near his old cabin on the Golden Gate claim.

THE Porterville *Enterprise* says: A great many Chinese are at work in the placer mines on Grizzly gulch. The diggings are deep, and most too much work about them for a white man, but the Chinamen work them and make lots of money.

The Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

	Cash.	Debt.
Alta	$48,644	$.....
Alpha	16,549	.....
Andes	16,795	.....
Bodie Con	16,440	.....
Benton Con	91,885	.....
Belcher	.....	39,359
Belle Isle	.....	2,924
Best & Belcher	12,288	.....
Bulwer	19,808	.....
Bullion	.....	.....
Challenge Con	5,653	.....
Caledonia	8,356	.....
Chollar	.....	9,897
Con. Cal. & Virginia	128,782	.....
Confidence	9,014	.....
Con. Imperial	.....	4,218
Con. New York	3,146	.....
Commonwealth	.....	40,753
Crocker	† 151	.....
Crown Point	9,143	.....
Del Monte	.....	21,257
Diana	3,925	.....
East Sierra Nevada	8,045	.....
Exchequer	6,879	.....
Gould & Curry	.....	4,668
Grand Prize	.....	56,530
Hale & Norcross	.....	9,457
Holmes	.....	5,585
Independence	606	.....
Julia	9,738	.....
Justice	7,144	.....
Kentuck	1,679	.....
Lady Washington	20,616	.....
Locomotive	728	.....
North Belle Isle	.....	7,642
North Commonwealth	.....	11,364
Mexican	9,200	.....
Mono	18,046	.....
Navajo	.....	21,344
Nevada Queen	.....	16,050
Occidental	‡	26 216
Ophir	19,070	.....
Overman	16,644	.....
Peer	7,575	.....
Peerless	629	.....
Potosi	.....	15,495
Savage	.....	31,909
Scorpion	8,768	.....
Seg. Belcher & Mides	.....	24 430
Silver Hill	19,758	.....
Sierra Nevada	770	.....
Silver King	11,267	.....
Standard	.....	§ 2,114
St Louis	582	.....
Syndicate	7,908	.....
Union Con	6,829	.....
Utah	2,408	.....
Weldon	5,226	.....

* With $60,134 in unsold bullion and further shipments to arrive.
† Bullion on hand not sold valued at about $5000.
‡ Bullion unsold valued at about $36,000
§ With unsold on hand valued at about $4768.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, term of subscription, and give it their own patronage, and as far as practicable aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

Jas. F. Wardner, who is identified with large lumbering, banking and mining enterprises at Fairhaven, Bellingham bay, is in the city. Mr. Wardner was the founder of the present prosperous town of Wardner, Idaho, and in conjunction with Gov. Hauser of Montana, he afterward sold the Sullivan mine at Wardner for $1,000,000. He has accumulated large wealth in less than five years, and is one of the most pushing men of the North.

DEL NORTE COUNTY CHROME.—The Del Norte *Record* says; The mountains of Del Norte abound in chrome enough to supply the wants of the United States for years to come. A Baltimore company has been working a chrome mine near this city for years, the ore being hauled to Crescent City in wagons, then shipped by either steamer or sailing vessel to San Francisco, and from there re-shipped to Baltimore.

THE trustees of the Mechanics' Institute are discussing the feasibility of putting up a fine permanent structure for their annual exhibitions. If it is decided to do this, the old fair building will be torn down and a new one erected on the site.

TOMBSTONE, ARIZONA.—Letters from our correspondent at Tombstone, Arizona, descriptive of the town, will be published in the PRESS as soon as engraving now in preparation is completed.

Successful Patent Solicitors.

As Dewey & Co. have been in the patent soliciting business on this Coast now for so many years, the firm's name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific Coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this Coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That this is understood and appreciated, is evidenced by the number of patents issued through their SCIENTIFIC PRESS Patent Agency (S. F.) from week to week and year to year.

Mechanical Engineer wishes an interest in established business. State full particulars and capital required. Address, CAL., Box 2517, San Francisco.

The Pittsburgh Boiler Scale Resolvent.

☞This Resolvent IS NOT AN EXPERIMENT but a FACT, and it will do the work claimed for it at a LESS EXPENSE than any other boiler purge, AND IN NO MANNER INJURE THE IRON.

CARNEGIE BROTHERS & Co., PROPRIETORS OF EDGAR THOMSON STEEL WORKS, PITTSBURGH, PA. WORKS AT BRADDOCK. Oct. 4, 1887.

We use the Pittsburgh "Boiler Scale Resolvent," and are well satisfied with the results obtained. We have tested nearly all Compounds presented to us, and this one **is the only good thing we have ever used.** Our feed-water is heated in Berryman Heaters, but owing to distance of heaters from boilers, we rarely exceed 150 degrees of heat in feed-water.

Our water is of the worst character, containing such bad impurities as **sulphate of lime, carbonate of lime, mud, and everything that is bad.** Very truly yours, WM. R. JONES, Gen. Supt.

No water in the United States produces scale in greater quantity or of a harder nature than the Monongahela River, containing SULPHATE and CARBONATE of lime, iron, MAGNESIA, SILICATE, SULPHUR, ALUMINUM, etc. The following well-known manufacturers, who are large steam users IN PITTSBURGH, and using the water from said river as boiler-feed for all their boilers, USE THIS RESOLVENT in their steam plant, and to whom reference is hereby made: Carnegie Brothers & Co., Proprietors of the Edgar Thomson Steel Works; Dilworth, Porter & Co.'s Spike Works; and Oliver and Robert's Wire Co.; and many other firms in the great manufacturing center WHERE THE RESOLVENT IS MADE. Reference is also given to Robert McMahon, Boiler Inspector for Alleghany Co., Penn., and to the following Railway Companies who use it on their locomotives: Kansas City, Fort Scott & Gulf Railroad; Central Iowa; Mexican Central; Delaware, Lackawanna & Western; Burlington, Cedar Rapids & Northern; Terre Haute & Indianapolis; Mexican National; and Denver & Rio Grande Western.

Upon receipt of order, WITH THE PROMISE OF FAITHFULLY CARRYING OUT THE PRINTED DIRECTIONS, we will furnish, FOR FIRST INTRODUCTION, a Barrel, or Half Barrel, of the Resolvent, and the invoice will bear the following stamp:

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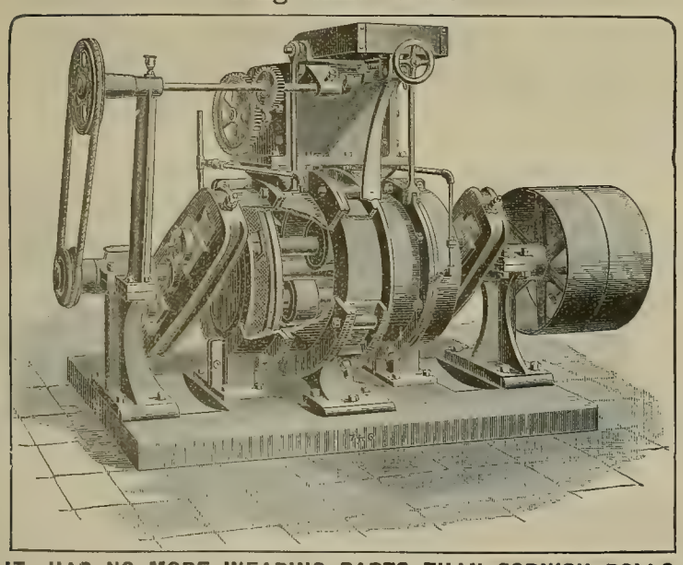
Sole Agents for Hoe Chisel-Tooth Saw, Gardner Governor, Schultz Leather Belting, Etc., Etc.

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FRISBEE WET MILL.

This Mill, with a weight of less than 9000 pounds, has a capacity of three tons per hour of hard quartz to 40 mesh; has been thoroughly tested; we guarantee its work as represented, and we will give long time trial.



IT HAS NO MORE WEARING PARTS THAN CORNISH ROLLS

And renewals will not cost over one-half as much as for stamps. Will run empty, or with small amount of ore without injury. The attention of parties having Cement Gravel is called to this Mill, as it will run 100 tons per day to No. 8 mesh; 30 to 35 H. P.

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SAWMILL MACHINERY,

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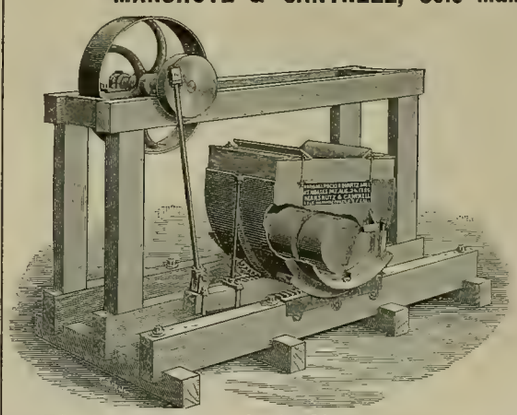
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NATIONAL ROCKER QUARTZ MILL.

KENDALL'S PATENT, AUGUST 24, 1886.

CAPACITY, 12 Tons in 24 Hours. 3 H. P.

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7. In point of amalgamation it is superior to any other machine in use.
8. In its simplicity of construction.

We challenge competition with Stamps, Ball Pulverizers or and other ore crushing machines now before the public.

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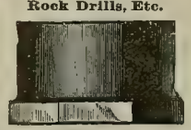


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ADAMANTINE SHOES AND DIES.—Guaranteed to prove better and cheaper than any others. Orders solicited, subject to above conditions.

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ESTABLISHED 1866.

Pacific Chemical Works.

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Stamp Mills for Wet or Dry Crushing. Huntington Centrifugal Quartz Mill. Drying Cylinders. Amalgamating Pans, Settlers, Agitators and Concentrators. Retorts, Bullion and Ingot Moulds, Conveyors, Elevators, Bruckners and Howell's Improved White's Roasting Furnaces, Etc.

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CONCENTRATING MACHINERY.

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IMPROVED CORLISS AND SLIDE VALVE STEAM ENGINES. ❋ BOILERS HORIZONTAL, VERTICAL ... AND SECTIONAL. ...

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Hoisting Engines, Safety Cages, Safety Hooks,

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Pumping Engines and Cornish Pumping Machinery,

IMPROVED WATER JACKET

Blast Furnaces for Galena & Copper Ores,

SLAG CARS AND POTS,

Roots & Baker Pressure Blowers,

SUSPENDED TRAMWAYS.

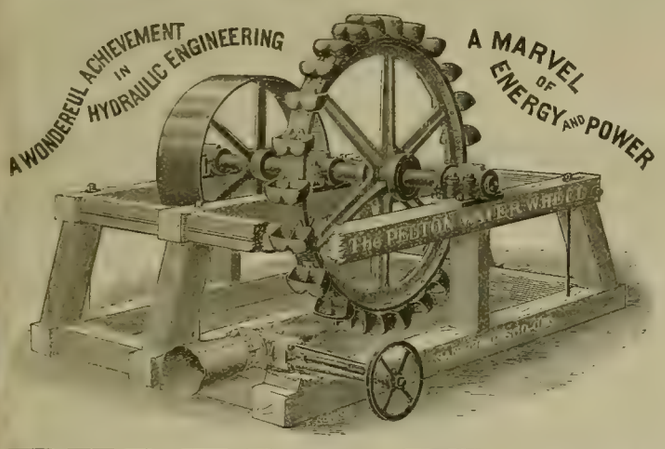
General Offices and Works: FULTON AND UNION STS., CHICAGO, ILL.

BRANCH OFFICES: NEW YORK, Room 43, No. 2 Wall St. DENVER, COLO., 1316 Eighteenth St. SALT LAKE CITY, UTAH, 7 W. Second South St. LONDON, ENG., 23 Bucklersbury, E. C. CHIHUAHUA CITY, MEXICO, No. 11 Calle de Juarez. LIMA, PERU, South America. JOHANNESBURG, TRANSVAAL, South Africa.

SOLE WESTERN AGENTS FOR TYLER WIRE WORKS DOUBLE CRIMPED MINING CLOTHS.

THE PELTON WATER WHEEL

GIVES THE HIGHEST EFFICIENCY OF ANY WHEEL IN THE WORLD.



OVER 800 ALREADY IN USE.

Affords the Most Simple and Reliable Power for all Mining and Manufacturing Machinery.

Adapted to heads running from 20 up to 2,000 feet.

From 12 to 20 per cent better results guaranteed than can be produced from any other Wheel in the Country.

ELECTRIC TRANSMISSION.

Power from these Wheels can be transmitted long distances with small loss, and is now extensively used in all parts of the country for generating both power and light.

APPLICATIONS

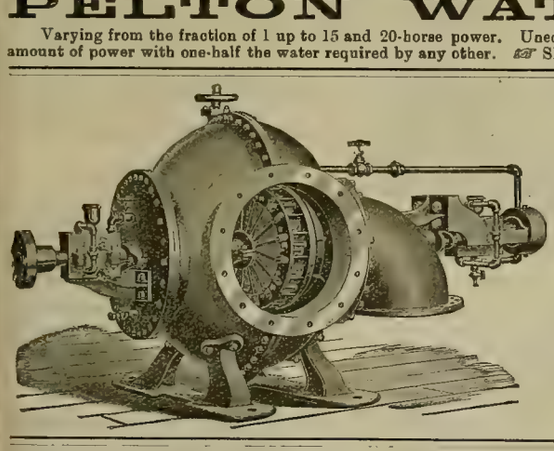
Should state amount, and head of water, power required, and for what purpose; with approximate length of pipe; also, whether the application is with reference to *Wheels* or *Motors* described below. SEND FOR CIRCULARS.

The Pelton Water Wheel Co.

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PELTON WATER MOTORS.

Varying from the fraction of 1 up to 15 and 20-horse power. Unequaled for all light-running machinery. Warranted to develop a given amount of power with one-half the water required by any other. ☞ SEND FOR MOTOR CIRCULAR. ADDRESS AS ABOVE. ☜



JAMES LEFFEL'S Mining Turbine Water Wheel.

These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

JAMES LEFFEL & CO.,

Springfield, Ohio, or 110 Liberty St., New York.

FRASER & CHALMERS, General Agents, Chicago, Ill., and Denver, Col.

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HENRY J. ROGERS & CO.

Successors to CHAS. CALLAHAN

IMPORTERS AND DEALERS IN

CAST and WROUGHT IRON SCRAP

SECOND-HAND BOILERS AND OLD MACHINERY

Of every description.

The Highest Price paid for all kinds of Metals.

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THE CALIFORNIA CONSOLIDATED Gold Mining Company, Sierra City, Cal., A. Schubert, President; Alvin Fischer, Secretary; A. Leffer, Superintendent. Divided into 300,000 shares at $1 each. Property comprises two locations. Ore assays $7 per ton, average. Coarse gold, solid rock; vein from 15 inches to 2 feet wide Tunnel No. 1 in 120 feet, and prospects well. No. 2 just begun. Stockholders: Alvin Fischer, A. Schubert, Gus Fischer, F. L. Fischer, Anton Fischer, Fred Fischer. For information concerning stock, etc., apply to F. L. Fischer Sierra City.

THOMAS PRICE & SON,

Assay Office, Chemical Laboratory,

BULLION ROOMS and ORE FLOORS,

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COIN RETURNS ON ALL BULLION DEPOSITS IN 24 HOURS.

WORKING TESTS OF ORES BY ALL PROCESSES.

SPECIAL ATTENTION PAID TO CONCENTRATION OF ORES.

Ores Received on Consignment, Sampled, Assayed, and Disposed of in the Open Market to the Highest Bidder.

Metallurgy and Ores.

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GOLD AND SILVER REFINERY And Assay Office.

Highest Prices Paid for Gold, Silver and Lead Ores and Sulphurets.

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BLUESTONE, LEAD PIPE, SHEET LEAD, SHOT, Etc., Etc.

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Standard Shot-Gun Cartridges,

Under Chamberlin Patent.

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ASSAYERS' MATERIALS, MINE AND MILL SUPPLIES,

ALSO CHEMICALS, AND PHYSICAL, SCHOOL AND CHEMICAL APPARATUS.

63 & 65 First St., cor. Mission, San Francisco.

We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price. Our New Illustrated Catalogue, with prices, will be sent on application.

☞ Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England. Also for E. G. DENNISTON'S Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices.

JOHN TAYLOR & CO.

Nevada Metallurgical Works.

NO. 23 STEVENSON STREET,

Near First and Market Streets, S. F.

C. A. LUCKHARDT, Manager. ESTABLISHED 1869

Ores worked by any Process.

Ores Sampled.

Assaying in all its Branches.

Analyses of Ores, Minerals, Waters, etc.

Working Tests (practical) Made.

Plans and Specifications furnished for th most suitable Process for Working Ores.

Special attention paid to Examinations of Mines; Plans and Reports furnished.

C. A. LUCKHARDT & CO.,

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Ores Sampled and Assayed, and Tests made by my Process.

Assaying and Analysis of Ores, Minerals and Waters, Mines Examined and Reported on.

Practical Instruction given in Treating Ores by m proved processes.

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GREAT REDUCTION!

BATTERY SCREENS.

Best and Cheapest in America.

No imitation, no deception, no planished or rotten iron used. Only genuine Russia iron in Quartz Screens. Planished iron screens at nearly half my former rates.

I have a large supply of Battery Screens on hand suitable for the Huntington and all Stamp Mills, which I will sell at 20 per cent discount.



PERFORATED SHEET METAL

For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass. Zinc and other metals punched for all uses.

Inventor and Manufacturer of the celebrated Slot Cut burred and Slot Punched Screens.

Mining Screens a specialty, from No. 1 to 15 (fine).

Orders promptly attended to.

San Francisco Pioneer Screen Works,

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JOHN W. QUICK, Proprietor.

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Nov. 7, 1889.

General trade is reported to be increasing in volume. Since the rains the feeling is very confident that 1890 will be a more prosperous year than had for all of four years past.

The October dividends disbursed in this city compare as follows:

	1888.	1889.
Banks	$131,250	$120,000
Gas and Water Co.'s	135,650	133 000
Insurance Co's	64,000	55,000
Street R. R. Co.'s	26,000	12,500
Powder Co.'s	27,000	27,000
Mining Co.'s	424,891	385,369
Miscellaneous Co.'s	66,250	87,750
Totals	$874,041	$820,619

S. H. Brooks, Assistant Treasurer United States at San Francisco, reports cash on hand Oct. 31, 1889, as follows:

National Bank Notes	$12,320 00
United States Notes	65,975 00
Gold Certificates	5,640 00
Silver Certificates	86,135 00
Gold Coin	41,457,775 50
Standard Silver Dollars	17,865,671 00
Fractional Silver	6,409,598 80
Minor Coin	3,380 28
Total	$65,906,495 58

The shipments of silver from the Sub-Treasury into the interior of the State and elsewhere for the month were as follows:

Standard Dollars	$232,260 00
Fractional Silver	56,830 00
Total	$259,090 00

MEXICAN DOLLARS—The market is active at higher prices. Sales from first hands are given to-day at 78 cts. for gilt-edged.

SILVER—The market has been steadily advancing throughout the week, closing to-day as follows: London, 43⅞d.; New York, 95¼ cts.; San Francisco, 96½ cts. The scarcity of the metal and growing wants for commercial purposes are the prime factors in producing higher prices, although the movements in this country and abroad to force silver to the front have much to do with it.

QUICKSILVER—The market is easy with a light demand reported. Receipts for the past week aggregate 350 flasks. Receipts in last month compare as follows:—1889, 1404 flasks; 1888, 1369; 1887, 3033; and the exports, 1889, 1787; 1888, 244; 1887, 1915.

BORAX—Receipts the past week aggregate 1089 ctls. For the month of October the receipts compare as follows:—1889, 61,700 lbs.; 1888, 672,500; 1887, 659,500. The market is firm, with a continued good demand. Exports the past week aggregate 20,786 lbs. to New York.

LIME—Receipts the past week aggregate 4007 bbls. The consumption and shipping demand the past week was a little more active.

GYPSUM—Imports the past week aggregate 250 tons from Port Moritto. The market has held fairly steady, with the consumption increasing.

CHROME ORE—There was a shipment the past week of 384,380 lbs. to New York. The market is without particular change. Eastern advices report a better demand, but no higher prices.

COPPER—The market has shown more vitality, with higher prices obtainable at the East. It now looks as if Lake will be advanced to 12 cts,, the figure at which it was first contemplated to keep it. European advices continue to report an active consumptive demand. A shipment of nine tons of refined was made the past week from this port to Germany.

TIN—The market has held strong in sympathy with the European, where there is a good speculative and consumptive demand. Imports the past week aggregate 100 bxs. plate.

LEAD—The market is inactive, at former quotations. Large consumers at the East do not appear to anticipate their wants.

IRON—Imports the past week aggregate as follows: From Oregon, 20 tons; Irondale, 175 tons. The market for spot parcels is essentially unchanged, although there appears to be a firmer tone. For shipment higher prices are asked, although we retain last week's.

The following are the latest comparative quotations f. o. b. at Glasgow:

	Oct. 23, '89.	Oct. 30, '89.
F. o. b. Glasgow,		
No. 1 Coltness	75s	76s
" Langloan	72s 6d	75s
" Summerlee	72s 6d	75s
" Gartsherrie	72s	75s
At Ardrossa.		
No. 1 Eglinton	58s 6d	61s
" Glengarnock	70s	72s
" Dalmellington	60s 6d	62s

POWDER—The four active local powder companies have formed a combine. The compact is to last for five years, and the percentages are as follows: California Powder Company, 37½; Giant Powder Company, 37; Safety-Nitro, 16, and the California Vigorit, 9½. The price of powder to the trade has been established by the combination as follows: 40 per cent powder, 18 cts. per lb. net in carload lots, and 20 cts. per lb. for less than carload lots; 50 per cent powder, 23 cts. for carloads and 25 cts. for less; 70 per cent powder, 28 cts. for carloads and 30 cts. for less; 30 per cent. powder, 15½ cts. for carloads, 17½ cts. for less. This is an average advance of about five cents per lb. over previous rates.

COAL—The imports the past week aggregate as follows: From Union Bay, 3500 tons; Departure Bay, 4200; Seattle, 4595; Port Moody, 1360; Tacoma, 2300—total, 15,955 tons. The market for steam, both spot and to arrive, is very strong, but with no higher prices established. The imports of Coast are again on the increase. It now looks as if any deficiency from Australia will be more than supplied by this coast, for our advices indicate an increasing output by the collieries on Puget Sound and in British Columbia.

Eastern Metal Markets.

By Telegraph.

NEW YORK, Nov. 7, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	43⅛	94⅜	$11 00	$3 80	$22 00
Friday	43⅜	94⅜	11 00	3 82½	21 80
Saturday	43⅜	94⅜	11 00	3 80	21 80
Monday	43⅜	94⅜	11 50	3 82½	21 95
Tuesday	43⅜	...	.....	.....	...
Wednesday	43⅜	95	11 50	3 82½	22 00

NEW YORK, Nov. 6.—Copper has shown continued strength at an advance. Tin holds strong under a speculative movement abroad. Lead is steady at current quotations. Quicksilver shows a firmer tone. Borax is unchanged. Iron is very stiff under a strong demand.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, November 7, 1889.

ANTIMONY	19 @ 20
BORAX—Refined, in carload lots	7½@ 7¾
Powdered " " "	7¼@ —
Concentrated " " "	— @ 6¾
All grades jobbing at an advance.	
COPPER—	
Bolt	21 @ 22
Sheathing	22 @ 24
Ingot, jobbing	15 @ 16
do, wholesale	13 @ 14
Fire Box Sheets	22 @ 24
LEAD—Pig	4½@ —
Bar	5 @ —
Sheet	6 @ —
Pipe	6 @ —
Shot, discount 10% on 500 bags Drop, ℔ bag.	1 45 @ —
Buck, ℔ bag	1 65 @ —
Chilled, do	1 85 @ —
STEEL—English, lb	16 @ 20
Canton tool	9 @ 9
Black Diamond tool	9 @ 9
Pick and Hammer	8 @ 10
Machinery	4 @ 5
Toe Calk	4½@ —
TINPLATE—B. W., steel grade, 14x20, P. S.	5 25 @ 5 37½
B. W., steel grade, 14x20, spot	5 00 @ —
Charcoal, 14x20	6 75 @ 7 00
do roofing, 14x20	5 50 @ —
do, do, 20x28	11 00 @ —
Pig tin, spot, ℔ lb	21½@ 22½
COKE—Eng., ton, spot, in blk & sks, reaptvly	17 00 @20 00
Do, do, to load	13 50 @14 50
QUICKSILVER—By the flask	— @47 00
Flasks, new	@ —
Flasks, old	35 @ —
CHROME IRON ORE, ℔ ton	10 00@— —

IRON—Glengarnock ton	Spot. 31 00 @— —	To Load. 29 @ —
Eglinton, ton	29 00 @— —	29 @ —
American Soft, No. 1, ton	— — @31 00	31½@ —
Oregon Pig, ton	— — @30 00	— @ —
Clay Lane White	— — @28 00	26 @ —
Shotts, No. 1	31 00 @31 00	— @ —
Bar Iron (base price) ℔ lb	2¾@ 3	— @ —
Langloan	31 00 @— —	30 @ —
Thorncliffe	31 00 @— —	30 @ —
Gartsherrie	31 00 @— —	30 @ —

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$20 00	$17 00
41 to 50 ft	21 00	18 00
51 to 60 ft	23 00	20 00
61 to 70 ft	27 00	21 00
1x3, fencing	22 00	19 00
1x4, "	21 00	18 00
1x3, 1x4 and 1x6, odd lengths	19 00	16 00
Second quality	17 00	15 00
Selected	24 00	22 00
Clear, except for flooring	31 00	28 00
Clear for flooring	2 00	.....
Clear V. G. No. 1 flooring	6 00	.....
Firewood	10 00	10 00
Dressed Pine, flooring, No. 1, 1x6	32 00	30 00
No. 1, 1x4	34 00	30 00
No. 1, 1¼x4, 1¼x6, and odd sizes	37 00	33 00
All sizes, No. 2	27 00	24 00
Stepping, No. 1	44 00	35 00
Stepping, No. 2	34 00	25 00
Ship timber and plank, rough	27 00	18 00
Selected, planed 1 side, av'ge 40 ft	29 00	24 00
" " 2 " " "	31 00	26 00
" " 3 " " "	33 00	28 00
" " 4 " " "	35 00	30 00
Deck plank, rough, average 35 ft	35 00	32 00
Dressed, average 35 feet	40 00	36 50
Pickets, rough, B. M	20 00	16 00
4x1½, 4 ft long, ℔ M	6 50	5 00

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	7 75 @ 8 00	Cardiff	9 50@10 00
Liverpool St'm	8 50 @— —	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	9 00 @ 9 00	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Gilman	7 00
Scotch Splint	9 00	Seattle	7 00
Greta	9 00	Coos Bay	6 00
Westminster Brymbo	9 00	Cannel	11 00
Nanaimo	9 00	Egg, hard	18 00
Sydney	8 0	Cumberland, in sacks	19 00
Jackson	6 00	do, bulk	18 00

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, department 10, San Francisco:

YAQUI M. Co. Nov. 4. Capital stock, $10,000,000. Directors, G. W. Sessions, B. L. Burling, J. F. Millner, David Wood and James Wood.

WILSHIRE SAFE AND SCALE Co. Nov. 4. Capital stock, $100,000. Directors, W. B. Wilshire, H. L. Sailor, B. T. Lacy, F. W. Eaton and F. B. Clarke.

WESTERN RAFT Co. Nov. 4. Object, to conduct the business of building large timber rafts upon the Pacific Coast and shores of Puget Sound and to transport and tow the same. Capital stock, $300,000. Directors, H. R. Robertson, J. M. Donahue, D. Mahoney, J. F. Chapman, Geo. A. Knight, W. Godfrey and D. J. Leary.

CALIFORNIA WATER, GASLIGHT AND FUEL Co. Nov. 4. Capital stock $500,000. Directors, H. Pease, L. D. Starkweather, J. H. Russ, J. W. Brown and D. C. Scott.

HUNTINGTON AND DIAMOND VALLEY STOCK AND LAND Co. Nov. 5. Capital stock, $500,000. Directors, Herrmann J. Sadler, Minnie C. Sadler, Ottilia Mau, Reinhold Sadler and William F. Mau.

SENTINEL PUBLISHING Co. Nov. 4. Capital stock, $25,000. Directors, L. B. Stephens, G. W. Dennis, W. W. Tally, A. A. Collins, C. A. Jamieson, E. J. Jackson and T. R. Phillips.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Belcher M Co	Nevada	13	50	Oct 17	Nov 20	Dec 11	John Crockett	327 Pine St
Central California Oil Co	California	1	50	Sept 6	Nov 1	Nov 18	F L Goriński	314 California St
Cadmus M Co	Nevada	—	20	Sept 19	Oct 31	Nov 25	J Craig	204 California St
California State Co	California	8	25	Oct 21	Nov 26	Dec 23	J O Hanscom	9 Mission St
Con Pacific M Co	California	11	10	Nov 1	Dec 4	Dec 23	F R Lully	330 Pine St
Chollar M Co	Nevada	28	50	Nov 1	Dec 4	Dec 24	C E Elliott	309 Montgomery St
Crown Point M Co	Nevada	52	50	Sept 18	Oct 21	Nov 11	J Newlands	329 Pine St
Del Monte M Co	Nevada	2	20	Oct 28	Dec 3	Dec 26	J W Pew	310 Pine St
Grand Prize M Co	Nevada	22	30	Sept 24	Oct 28	Nov 19	R R Grayson	327 Pine St
Golden Jacket M Co	Nevada	3	10	Oct 14	Nov 21	Dec 20	R G McClellan	331 Montgomery St
Golden Prize Con M Co	Nevada	3	25	Sept 21	Oct 26	Nov 16	C D Bennett	330 Pine St
Gould & Curry M Co	Nevada	63	30	Oct 15	Nov 18	Dec 11	A Durbrow	309 Montgomery St
Gray Eagle M Co	California	15	6	Oct 16	Nov 18	Dec 10	J M Buffington	303 California St
Locomotive M Co	Arizona	5	5	Oct 19	Nov 25	Dec 17	A H Fish	309 Montgomery St
Lapanta Con M Co	Nevada	2	02	Oct 2	Nov 8	Dec 2	J Stadfeldt	309 Montgomery St
Mexican M Co	Alaska	1	25	Oct 11	Nov 11	Dec 2	...	...
North Belle Isle M Co	Nevada	16	20	Sept 18	Oct 22	Nov 13	J W Pew	310 Pine St
Norte Bonanza M Co	Nevada	9	10	Sept 17	Oct 26	Nov 14	J F Bolling	410 Montgomery St
Navajo Queen M Co	Nevada	2	10	Oct 23	Nov 26	Dec 11	J F Holling	533 Kearny St
North Gould & Curry M Co	Nevada	11	20	Nov 6	Dec 7	Dec 27	C H Mason	331 Montgomery St
Nevada Queen M Co	Nevada	6	20	Oct 31	Dec 4	Dec 30	H Deas	309 Montgomery St
Oak Con M Co	California	4	7	Sept 5	Oct 19	Nov 20	E J Ryan	230 Montgomery St
Potosi M Co	Nevada	33	50	Sept 18	Oct 22	Nov 12	C E Elliott	309 Montgomery St
Phil Sheridan Con M Co	Nevada	4	10	Oct 22	Nov 26	Dec 11	J F Holling	533 Kearny St
Peerless M Co	Arizona	13	10	Oct 11	Nov 19	Dec 10	A Waterman	309 Montgomery St
Palisade M Co	Nevada	2	5	Nov 1	Dec 16	Jan 9	D Buck	309 Montgomery St
Si ver Hill M Co	Nevada	25	20	Sept 27	Oct 31	Nov 21	D C Bates	309 Montgomery St
Sierra Nevada	Nevada	96	50	Oct 5	Nov 3	Dec 7	E L Parker	309 Montgomery St
Seg Belcher & Mides Co	Nevada	4	25	Oct 7	Nov 4	Dec 8	E A Holmes	309 Montgomery St
Savage M Co	Nevada	74	50	Nov 5	Dec 10	Dec 30	E B Holmes	309 Montgomery St
Tuscarora Con M Co	Nevada	2	10	Oct 12	Nov 15	Dec 5	J J Scoville	309 Montgomery St
Trojan M Co	Nevada	18	10	Oct 23	Nov 26	Dec 11	J F Holling	533 Kearny St
True Con M Co	California	7	24	Aug 31	Oct 12	Nov 16	J O Hanscom	434 California St
Utah Con M Co	Nevada	8	25	Oct 23	Nov 26	Dec 16	A H Fish	309 Montgomery St
Union Con M Co	Nevada	39	25	Oct 8	Nov 9	Dec 13	J M Buffington	303 California St
Vine Spring M Co	California	1	15	Oct 10	Nov 11	Dec 9	F S Snell	218 Sacramento St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Bodie Tunnel and M Co	California	C Harvey	303 California St	Annual	Nov 11
Confidence S M Co	Nevada	A S Groth	414 California St	Annual	Nov 8
Challenge Con M Co		C L McCoy	329 Pine St	Annual	Nov 21
California Slate Co	California	J O Hanscom	9 Mission St	Special	Nov 25

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Champion M Co		T Wetzel	522 Montgomery St	10	Oct 15
Caledonia M Co	Nevada	A S Cheminant	328 Montgomery St	08	Aug 5
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	Sept 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	Aug 25
Idaho M Co	California	...	Grass Valley	5 00	Nov 7
Mt Diablo M Co	Nevada	R Heath	319 Pine St	30	Oct 23
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Sept 10

Mining Share Market.

The mining share market the past week was fairly active under livelier but small fluctuations in the Comstocks than witnessed for some time. The market, as usual, puzzles those outsiders who are always on the alert to win success against the odds they necessarily must encounter with insiders knowing a long time ahead what there is in the mines and how to have them, the outsiders, and the market worked to the best advantage, so as to bleed the street of all the available money. As usual, "decoy ducks" are brought into requisition, so as to lead the more credulous of the outside public into traps set to catch them either on the short or long side—which makes very little difference to the pool so long as money is put into their already-overflowing exchequer. With the break in prices, on last Friday and Saturday, the majority of outsiders had the market going still lower, and even now they are daily looking for a break, and at each setback they feel confident that it is at hand. In this opinion they are confirmed by the levying of more assessments, with reports of others to follow at an early day. They also think they are confirmed in their views by an almost entire absence of news from the mines, for they think if there was anything important it would leak out. The few remaining bulls, although somewhat discouraged, express greater confidence than ever in the situation. They think that assessments are being levied to force them to sell their stock. They also say that the absence of news from the mines is in keeping with the levying of assessments, so as to disgust them with their holdings. They also say that every means is being used in this city and other places where stocks are traded in, to get the public to sell, and as the pool have been free buyers through outside selling, they are not apt to sell at a loss. In outside stocks there has been only moderate trading, although toward the close the Tuscaroras begin to show more life.

It is rumored that a conference is shortly to be held in this city between the mine-managers, mine and mill superintendents of the Comstock mines and representatives of the ranchers controlling the water supply at the head of the Carson river, relating to the distribution of water in the channel of the river to supply power to the mills. If this rumor be true, and an amicable arrangement be arrived at, we may look for a very active season in the extraction and milling of Comstock ores. It is claimed that, with all the stamps dropping, all of 6000 tons of ore will be milled daily.

Reliable news from the Comstock mines is difficult to get. There is no doubt but during the late dry spell the various mines were systematically and quite thoroughly explored, with several put into the best possible position for work during the rainy season. With cold weather, work on lower levels can be advantageously resumed; and it is confidently believed by experienced mining men that in several mines running from the 1000-level down to the 1800-level, rich ore will be run into with proper work inaugurated. Our latest information reports running into $40 and $60 ore in Best & Belcher, on or about the 1000-level, toward the Con. Virginia line. Since then work is reported to have been stopped, The work now going on in several of the mines deserves careful watching, as they are nearing interesting ground. From the outside mines our advices are not essentially changed from last week's reports. Many dealers are confident of better results soon in the Tuscarora, Silver King, Eureka, Candelaria and Quijotoa districts.

Market opened this (Thursday) morning topheavy, under outside selling on bear points—all stocks offered were taken in at drooping prices. Official information reports resumption of work in joint Challenge-Confidence-Con. Imperial, west crosscut on 500-level. The Mexican mill has started up on Crown Point ore; the Nevada mill on Hale & Norcross and Chollar ore, and Rock Point mill on Savage ore. Part of the Brunswick mill stamps will soon commence dropping Confidence ore.

THE Mayflower gravel mine near Forest Hill has yielded $392,809.57 in gold since Dec. 11, 1888.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 17.		WEEK ENDING Oct. 24.		WEEK ENDING Oct. 31.		WEEK ENDING Nov. 7.	
Alpha	1.05	1.25	1.00	1.15	1 25	1.50	1.30	1 50
Alta	1.85	2.30	2.00	2.30	2.05	2.40	2.10	2.25
Andes	60	....	.55	.60	.60	.75	.60	.30
Belcher	2.25	2.60	2.10	2.30	2.30	2.80	2.25	2.70
Best & Belcher	3.05	3.55	2.80	3.1	2.95	3.95	3.25	3.85
Bullion	.50	.60	.50	.55	.55	.70	.60	.70
Bodie Con	.65	.8	....	....	.75	.85	.65	.75
Benton	3.25	....	....	....	....	....	3.25	3.25
Bulwer	.25	....	.15	.30	.25	....	.25	.35
Commonwealth	2.95	3.20	2.85	3.0	2.80	3.05	3 60	3.10
Con. Va. & Cal	5¾	6¼	5¼	6¾	5.50	6¾	6¾	6¾
Challenge	2.25	2.65	1.90	2.10	2.10	2.50	2.00	2.50
Chollar	1.55	1.70	1 45	1.65	1.50	2.10	1.60	2.00
Confidence	6.25	6.75	6.00	....	6¾	7	.52	.06
Con. Imperial	.35	.45	.30	.35	.35	.45	.35	.40
Caledonia	....	....	....	....	.20	....	.25	....
Crown Point	2.05	2.20	2 00	2.50	2.55	3.15	2.50	3.00
Crocker	.40	.50	.45	....	....	.60	....	.50
Eureka Con	3.20	4.60	3.60	4.50	4.10	4.25	4.10	4.50
Exchequer	.50	.55	.55	....	.55	.70	.55	.70
Grand Prize	.55	.70	.55	.60	.50	.90	.80	.90
Gould & Curry	1.55	1.90	1.35	1.55	1.50	2.00	1.50	1.85
Hale & Norcross	2.75	3.00	2.75	2.95	2.90	3.35	2.95	3.20
Julia	.20	....	.20	....	....	....	.30	.45
Justice	1.35	1.55	1.40	1.50	1.45	2.00	1.70	2.00
Kentuck	1.15	1.15	1.00	....	1.00	1.20	1.05	1.20
Lady Wash	....	....	.35	....	.40	....	.40	....
Mono	.60	....	.55	.50	.65	.55	.65	.65
Mexican	3.40	3.80	3.10	3.60	3.30	4 40	3.65	4.20
Navajo	.30	....	.35	....	....	....	....	....
North Belle Isle	.70	.75	.70	.90	.85	.90	.90	1.00
Nev. Queen	.60	.75	.60	....	.55	.70	.65	.70
Occidental	1.10	1.30	1.00	1.15	1.10	1.40	1.15	1.35
Ophir	4.05	4.55	3.70	4.20	4.00	5.00	4.30	4.95
Overman	.95	1.10	.80	.95	.90	1.10	.90	1.05
Potosi	1.10	1.25	1.05	1.60	1.50	2.10	1.07	2.05
Peerless	.25	.30	.20	....	.25	....	.25	.30
Peer	....	....	....	....	....	....	.15	....
Savage	1.55	1.75	1.60	1.70	1.50	2.10	1 45	2.00
S. B. & M	1.15	1.40	1.05	1.15	1.25	1 55	1.15	1.50
Sierra Nevada	....	....	1.55	1.90	1.60	2.15	1.70	2.20
Silver Hill	.15	.20	.15	.20	.15	.60	.55	.50
Scorpion	.25	....	.25	....	.20	.25	.25	....
Union Con	2.80	3.00	2.60	2.85	2.75	3.25	2.70	3.15
Utah	.85	.90	.65	.85	.70	.90	.80	.90
Weldon	.20	....	....	....	....	....	....	....
Yellow Jacket	2.90	3.15	2.75	2.95	2.75	3.40	2.75	3.25

Sales at San Francisco Stock Exchange.

THURSDAY, Nov. 7, 9:30 A. M.

100	Alpha	1.55	
100	Andes	.70c	
100	Belcher	2.45	
500	B. & Belcher	3.55	
100	Buiwer	.35c	
355	Con Va & Cal	6.37½	
200	Chollar	1.65	
150	Crown Point	2.90	
50	Confidence	5.75	
100	Con. Imperial	.35c	
50	Exchequer	.70c	
650	Gould & Curry	1.75	
100	Hale & Nor	3.15	
150	Justice	1.80	
800	Mexican	3.85	
500	Navajo	.30c	
250	N. Commonwealth	.95c	
150	Ophir	4.75	
650	Overman	1.05	
200	Potosi	2.00	
300	Peer	.15c	
400	Peerless	.20c	
70	S. F. Gas	.57 75	
250	Savage	1.70	
730	Sierra Nevada	2.55	
450	S. B. & M	1.60	
600	Silver Hill	.60c	
900	Union	3.20	
250	Utah	.80c	
350	W Comstock	.25c	
600	Y A Sou	.45c	
120	Yellow Jacket	3.15	

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Mount Diablo, Nov. 5th, $6237; Chipps Flat (Sierra Co.), 2, $21,000; Hanauer, Oct. 30, $5775; Con. Virginia and California, Nov. 2, $33,702; Eureka Con., 4, $31,000; Occidental, 4, $9732; Hanauer, 1, $2325; Justice, 4, $7144.

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THE Redding Reduction Works at Redding, Shasta county, have not been running this summer, but will be at once started by Wm. R. Conant, W. H. Fowler and others. They are intended to work custom ores.

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NOTICE is hereby given that at a meeting of the Board of Directors, held on the 16th day of October, 1889, an Assessment, No. 15, of Six (6) Cents per share was levied upon the Capital Stock of the Corporation, payable immediately, in United States Gold Coin, to the Secretary, at the office of the Company, Room 11, No. 303 California St., San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 18th day of November, 1889, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Tuesday, the 10th day of December, 1889, to pay the delinquent assessment, together with the cost of advertising and expenses of sale.

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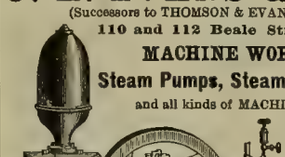
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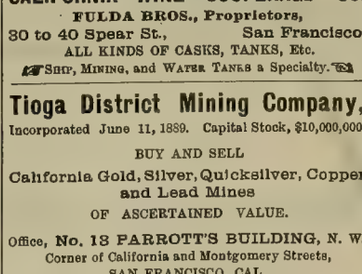
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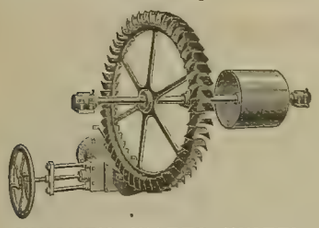
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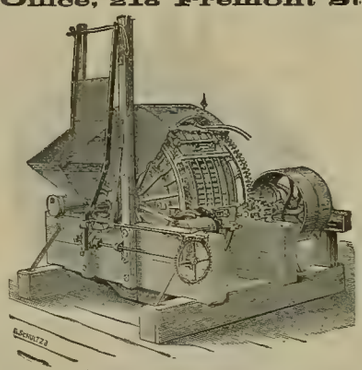
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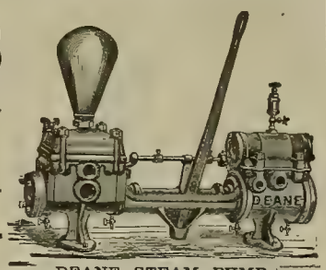
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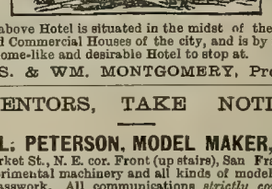
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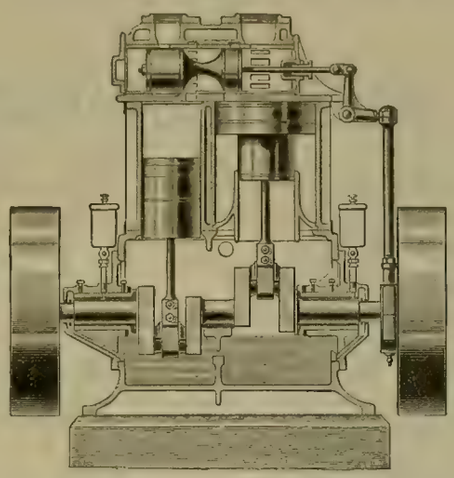
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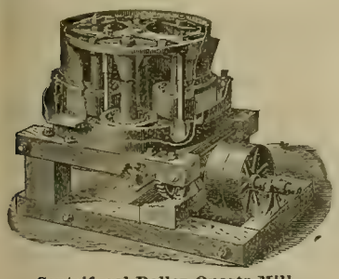
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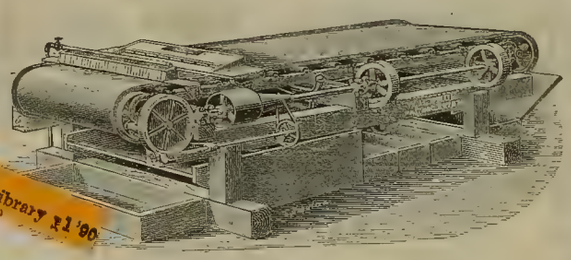
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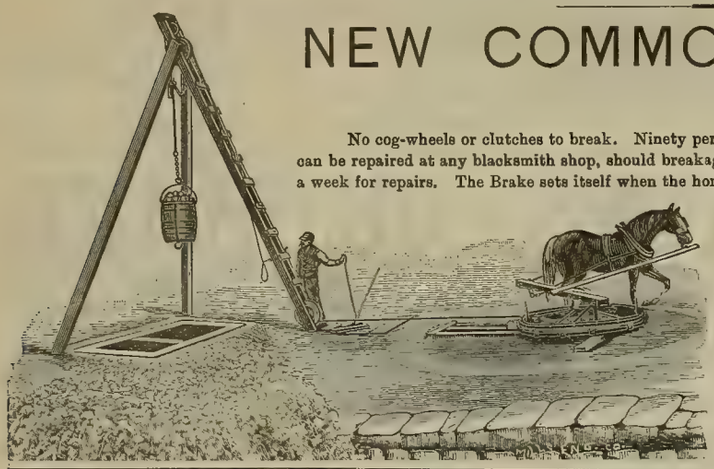
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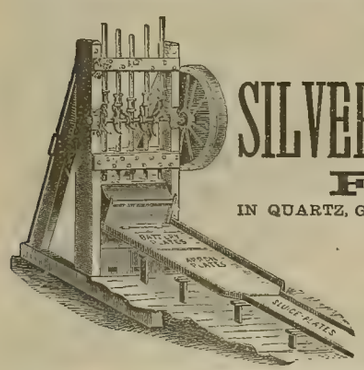
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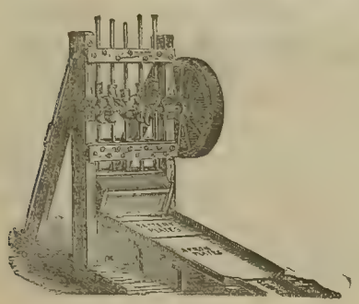
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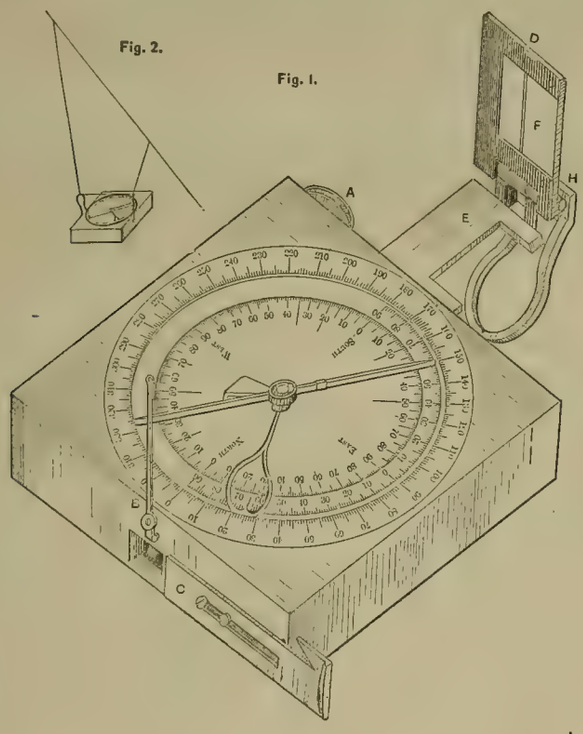
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Fig. 2.

Fig. 1.



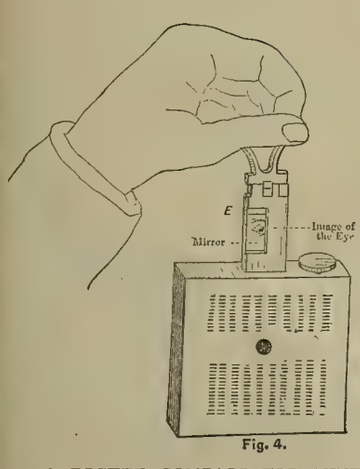
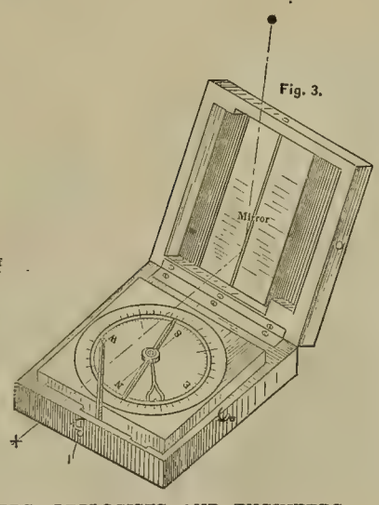


Fig. 4.

Fig. 3.



A POCKET COMPASS FOR MINERS, GEOLOGISTS AND ENGINEERS.

The handle, *H*, is flat and pear-shaped, and is movable about its hinge so as to be capable of taking various positions. The opening on the north side of the box, shown in Fig. 1, but not lettered, leads to a chamber in the hollow space beneath the disk. This chamber serves as a place of storage for a small ball-and-socket joint, one end of which can be screwed into a hole in the compass bottom directly under the center-pin, while the other end is provided with a screw by which the instrument can be attached to any convenient wooden support.

When the compass is used for rough work, the cover of the case is opened and the eye so placed as to see on the red line of the mirror the reflection of the object sighted to, additional accuracy being obtained by raising up the north sight *B*. Closer results are obtained when the compass is taken from the case and put on a flat surface and both sights used; to secure the maximum of accuracy, the socket joint must be used.

When used as a leveling instrument, the sliding plate *E* must be drawn out and the south sight must lie flat on it, the compass being held by the handle and allowed to hang freely from the hand (Fig. 4). In this position the sight will be on a vertical plane and consequently the object seen through the vane, and the image in the mirror will be in the same horizontal line. The square form of the instrument facilitates its use as a clinometer. On the back of the compass a table is engraved giving the percentage of rise corresponding to angles. R. A. Bergier of Butte City, M. T., described and exhibited this compass at a meeting of the American Institute of Mining Engineers a few months since.



A MOUNTAIN GRAVEL MINE—See page 331.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

On Mining Frauds.

The Various Kinds Known.

EDITORS PRESS:—To write intelligently, impartially and comprehensively on such a complicated subject, which has so many side issues, and in which ethical principles are interwoven with business considerations, it is necessary to proceed systematically, and thus to divide the different phases, balancing between mere "bilk" and downright robbery into several classes, according to the diversity of interests and occupations more or less closely connected with the mining industry. This article may thus be divided into four departments—that of assayer, that of prospector and his agents, that of mining expert, and that of director of company and superintendent of the plant.

It is not claimed that this article should be a complete exposure of the various frauds ever practiced by and on miners and those connected with mining, for it seems scarcely possible that all frauds committed in any form, shape or manner, coming under one of the different heads, could be known to one single individual (unless he claims omniscience or clairvoyance), nor that they could all be condensed into a newspaper article; neither shall they embrace a longer period than the last 40 years, nor more territory than the Pacific Coast.

It is not easy to decide or to determine

What Constitutes a Fraud.

Much depends on the elasticity of conscience of those concerned therein or affected thereby, or on the amount invested, for many would not care to mention or to think about the loss of a few hundred dollars, while they would be highly incensed if the loss goes into thousands. Much, too, depends on the perspicuity or short-sightedness of the victims, for it often happens that such a one is in happy ignorance of a fraud, while a knowing one detects it. If a wrong statement—in plain English, a lie—should be called a fraud, then we fear that 99 per cent of mining transactions, particularly the representations of prospectors and their agents, would have to be called fraudulent; yet nobody would call a prospector a liar or a fraud when he represents his find or his claim richer than it really is, even if the average assay of the ore is 90 per cent below that of the specimen a miner brings for inspection. One is so much used to see the prospectors with only rich and exceptional specimens that by common consent one never accepts their representations.

Assay Returns.

He is considered "square," anyhow, merely too much excited, etc. Yet it not infrequently happened in the loose olden times that the specimens produced and alleged to come from a certain locality were from other places. It happened, too, that "my honest prospector" or his agent tried to induce (and, may be, succeeded occasionally) some assayer to give him "a good return," particularly when they had some one on hand who might buy a mine on an assayer's certificate. (This race has died out.) Then the assayer was told, in confidence, that it "would be to his advantage" to give high returns; it was even sometimes specified how many dollars per ton were "expected," and great was the disappointment, often even indignation, long the faces, when the returns were too small, or nil. "Oh, he is a no-good assayer; let us go to another one." This impression, that only that assayer giving the highest returns is *eo ipso* the best one, was formerly the current one. Even at this late day it is not yet eradicated with some operators who ought to know better, and may be taken advantage of by some assayer by regularly adding a few dollars to the amount found by assay, and thus satisfy and attract customers.

A good story happened in the early "sixties," when ore-assaying was going on at a lively rate. Here it is: One day a Mr. B. brought a crushed sample for assay, saying he expected it to go $115 silver per ton. By assay it proved worthless, and the returns were accordingly: "Contains neither silver nor gold." But Mr. B. produces a certificate of assay by a San Francisco firm, showing a crushed sample, left by the same party, with a result of $118 50 silver per ton, and Mr. B. says it is the result of half the sample left with me. "I can't help it. I give whatever I find, not what you expect; yet as you are an old customer I will make a re-assay, though convinced beforehand that no other result will be reached." Quoth old customer: "Well, well, never mind, my good friend; I am satisfied now, for I crushed a cobblestone, brought one sample to M. and one to you, with the same remark of expecting $115 silver per ton, and here have we the result." Comment is useless. After all, an assayer's opportunity to commit fraud is limited to false returns.

Salting Claims.

A prospector's occupation affords a wider and more interesting field of operations. To produce some rich ore and to pretend it came from his claim when it did not, is too clumsy a deception to deserve mention. A "smarter" way is to take a buyer or expert to an adjoining claim in the owner's absence, and to represent, possibly to sell, the neighbor's claim as his own. Of course, in this as in other similar transactions immediate disappearance after a sale is or was the order of the day (or of the night). The "salting" of a claim is more ingenious, and allows several modifications. If a placer claim, nothing is more simple than to sprinkle some gold-dust on some spots and then to lead the examining party nonchalantly up to it, or to introduce by sleight of hand some gold-dust into the pan or sample.

Such a thing was done on a grand scale some years ago by some "sharps," who sowed many thousand dollars worth of rough diamonds over some out-of-the-way place down in Arizona or Colorado, and then let an unsuspecting and innocent M. E. scrape it up and report accordingly.

The "salting" of a ledge or vein is done on the same principles, by dumping into the drift or shaft a quantity of good ore from the neighborhood, and letting the examining party pick it up. Some years ago it happened in Nevada that this operation was practiced, by throwing a few sacks of rich ore into an abandoned shaft, and then on the strength of the good returns of the samples taken therefrom, selling the claim to its present proprietor. The seller left the State in a hurry, and the buyer put some men to sink the shaft a few feet deeper, and was not at all astonished when a rich ledge was struck, which, by its size and value of ore, justified the erection of a large mill. A year or two afterward the seller ventured to return, and then his astonishment was not small. A similar occurrence, where the would-be biter was bitten, happened lately in El Dorado Co. Two tons of quartz was crushed as a test and its owner introduced two ounces of gold into the battery, and is said to have uttered some pious exclamations when the result showed half an ounce for the two tons. The balance of the gold was lost by wrong management or poor condition of the mill.

The "salting" of rock can be done in the mine itself without introducing any ore, by sprinkling a solution of gold or of silver, as the case may be, on the walls, on the face of the tunnel or on the bottom of the shaft; and when the examining M. E. breaks off samples with his own hand and assays them himself, he gets high, yet incorrect returns, and reports accordingly, if he is "not up to the trick." As remarked, it is an easy and occasionally practiced way to add some precious metal to a lot of ore which is sent to a mill for a test on a large scale; therefore suitable precautions ought to be taken. It cannot be called a fraud, when a mine-owner picks out the best spots and hands to the would-be buyer the stuff for examination; any one may expect this and must therefore rely on his own judgment, irrespective of the talk and advice of the owner.

"Mining Experts."

A mining expert is not subject to manifold temptations, yet occasionally these may be great in proportion to the importance and value of the property examined. A fraud can be and is perpetrated by listening to the wily talk of the seller, and then by knowingly misrepresenting the value of ore, conditions of mine, water facilities, title, and in general of everything which is of interest to be known, or by willingly neglecting to report what ought to be known. A contingent commission is a strong incentive to put on the brightest colors.

"Presidents and Superintendents."

And what of presidents, of directors of companies and of superintendents of plants? The committing of fraud often goes on by combination of the three—sometimes of only two parties—yet not a few instances are known when one party only did the evil deed. Where a company is small or unorganized, the management of the mine is left to the moving spirit of the concern, and as experience in the past teaches, in the majority of cases, fraud or incompetency was the cause of total loss to the stockholders. Such a fraudulent spirit collects what assessments he can; if there is a ledge and the ore is valuable, he goes to work. If the locality is far away or not easily accessible, the better for him and the worse for his victims. And he works so assiduously, writes encouraging letters, directs all the work, takes out good ore as long as it lasts, sells it—and keeps all proceeds, too. If he informs the stockholders that the expenses were equal to the yield, he thinks he has done all that is required. If such a game is "played out," he tries another locality, and repeats a similar operation till he cannot find any more credulous persons, and till all who know him shun him, as "fraud" in large letters is stamped on his face. Then he begins epistolary operations, and woe to the Eastern or European correspondents that listen to his propositions. This pen-picture can be recognized by and applied to many individuals.

Or where a mine is important, the shares numerous and quoted in the Stock Board; suppose a rich ore body is discovered by diamond drill or otherwise — absolute secrecy is enjoined by the superintendent. The few miners who know of it are either bribed not to say anything, or they are made to believe that the ore is base and worthless; yet the spot is covered by debris and deadwork done in other parts of the mine. Poor ore is sent to the mill, and as the returns are below the expenditures, assessments are levied until the shares go low enough to enable the "knowing ones" to rake them in, and only then the good spot is worked for all that it is worth. We all, out here, know the rest.

Such fraudulent operations admit of several modifications, and were practiced formerly all too frequently, as a few gainers and many losers will remember too well.

Mining at Long Range.

Or suppose a mine is worthless—a real "sucker" on the shareholders. In that case the superintendent or his secretary must be a good writer, must know how "to put it on" irrespective of his incapacity in the business he ought to conduct. His weekly reports speak regularly of good indications, and when an assessment becomes necessary, the tone of his letters rises to "excellent indications, sure to strike a large body in a short time," etc. And so it goes on and on until the stockholders become tired of being bled for the benefit of the "popular secretary" and a few "capable" ones, and out goes the flame.

Again, suppose the "mine" is somewhere in an out-of-the-way place—Mexico, for instance. We have a nice, plausible superintendent. He writes often enough and gives full description of the mine, states what work is done and has to be done, how promising the indications are and how much money is needed per month. Thus it goes on month by month; his letters are encouraging and regular—so are the assessments and remittances to him. But it happens that a shareholder wants to see for himself, and visits the place unheralded. Whom and what does he find? The superintendent swinging in a hammock playing the guitar to some fair senoritas—and the mine (?) a small hole in the ground; no work, no ore, no indications of any. The superintendent's business (!) consisted of writing letters and fictitious reports, riding to the next town to post them and to receive remittances and to spend time and money with the women.

These and other similar frauds were practiced, and may be yet attempted to be practiced with more or less modifications or success or impunity in all mining States and Territories, Mexico not excluded. In Sonora, for instance, such practices may only be called "smart," when a foreign, particularly an English company, is concerned. Their agent, consulting engineer and superintendent may have some stock of the company which he wants to sell. A report is sent, showing a large and profitable mine. The company is induced in some manner to put up a mill, and when ready, lo! no ore is in sight. But this makes no difference at all. A cablegram is sent: "Mill running; plenty rich ore in sight," and based on such representations, the agent's stock is or may be sold. So are the stockholders.

And when remonstrated with, the answer of the worthy may be (as it was in reality): "D—n the English to Hades! We are here to make money out of them." This was a plain statement, easy to understand. It is not often one is obliged to witness such barefaced fraud; the race of gullible Englishmen is dying out, even if that of the rascals and frauds is not. Yet if the supply of victims fails, the latter have to starve, and will starve, let us hope.

THEO G ED. WOLLEB.

A Stage-Road Through the Sierras.

EDITORS PRESS:—The traveler who makes an early start from Truckee is thrice rewarded for his early rising, though, to be sure, when traveling by stage in some directions he has no choice for his breakfast-hour. The overland train which leaves San Francisco at 6:30 P. M. reaches the wildest beauty of the Sierras at about 5:30 A. M., threading its way through miles of rock and pine land, passing Donner lake, lying like a long dazzling mirror of brightness between the purple hights, just at sunrise, and reaching Truckee about 7:15. Then he whose way lies toward the interior fastnesses of the mountains has just time for a hasty breakfast before the stages start on their long, rough journeys through the hills. But in truth the early morning is the perfect hour. Then all the bright glory of the day is new and sparkling; then the sweet mountain air holds its best freshness and purity.

Two lines of stages leave Truckee for Sierra valley at the same hour—one owned by Nichols & Co., the other by Abbe—making about the same time to their destination. The driver of the Nichols stage, Mr. Richardson, is in all respects a most agreeable and competent driver, having traversed this route for a number of years and remembering anecdotes of interest about every furlong of the way. He drives regularly the year through, making daily trips from Truckee and back in the summer and three a week during the snowy months. Few passengers travel in the coldest season, and Mr. Richardson often drives the 30 miles into Sierra valley alone, through clouds of driving snow-storm and over grades half filled with drifts. There are hillslopes which in summer the spirited horses ascend in a few minutes' time, where often a half-hour is spent in persistent struggles when the snow lies deep and fine along the road. Strange indeed is the contrast of that white, silent world of winter, wild and majestic in its loneliness, to the bright stirring days of summer when the tourists bring a spice of the life from the outer world into this far mountain retreat to redeem it from its quietude and settled peace.

In the fresh early hours of summer mornings there is an exhilaration even in the atmosphere, when one starts forth for a journey through this country wild and wonderful. The inspiration of a new strange world sheds its romantic glamour over all the shifting landscapes and the chill sweet breath of the mountain air, but adds its bracing keeness to enhance the charm. One is reminded of some fanciful distorted dream of mountain life in the experience of this early journey, so rare and striking are the features which nature has assumed to charm us here.

The road leading out of Truckee to Sierra Valley, after ascending a low hill just outside the town, stretches away for miles across a long level plateau through the hills. At this fresh hour the sky droops low above us in dainty tints of cloudy pearl, and all the far-off line of hills that fringe the dim horizon fade to pale encircling walls of smoke, while the slim-pointed crests of endless pine groves melt away in seas of pearl-like summery haze.

Much of the timber in the vicinity of Truckee has been cut, and large quantities of it destroyed in the early years, so that the heavy pine forests are somewhat thinned, and fallen trees, charred and decaying, and jagged stumps, add a new feature to the picturesque desolation of the frontier scene.

After a few miles the country becomes more bare and rocky, breaking into rolling hills, where the celebrated Daily dairy is situated near the margin of a stream. This is considered the coldest spot in California during the winter season, vast quantities of ice forming on the stream about half a mile above, where it is cut and prepared for shipment to all parts of the coast.

A few miles beyond Daily's the country begins to grow more rugged and the pine forests heavier and more majestic. The very secret beauty of the woodland, the wild, sweet mystery of the mountains, there unfolds and inspires a troop of dreamy thoughts as delightful and as fragrant as the odors shaken from the whispering pine-crests. Vain, almost, would be the effort to imagine such a world of pine! Far as the eye can see stretch the vast forests—rising tall and beautiful all around us in the nearer groves, and showing, in bright surprising pictures through the openings, miles on miles of shivering trees that cover the hights with straight, slim stems of black, against the depthless seas of green, and fringe the far horizon with myriads of spear-like points. In one spot a wayside spring wells over its rocky basin and flows across the road. Its waters are as pure and cold as melted snow-flakes—coming as they do out of the very deepest, stoniest heart of riven mountains. The water of these high altitudes is justly celebrated for its purity and delightful coolness, yet one can scarcely appreciate its value till he drinks from some such roadside spring where the water comes bubbling and sparkling from the gravelly crevices, clear and cold and beautiful as earliest dew-drops. It is the ideal draught, the magic elixir, that flows through pine-tree hearts and distills in liquid music from the boughs the very wine of Nature's purest gifts.

It is in this depth of woodland that much of the lumbering for the Truckee market is carried on. Several sawmills are kept busy through the summer season, some of them being only the small portable mills which remain in one spot just long enough to exhaust the timber best suited to their capacity and then remove to another locality. However, these portable mills do comparatively little work, and one large milling company have maintained at large expense a log float to transport logs from higher sections to their mill. It runs in sight of the stage-road for long distances, a high trestled flume, filled to the brim with swift and irresistible floods. The logs are only floated down to the mill between the hours of 11 and 2, owing to the scarcity of water, but even then large quantities of timber are thus transported from one point to another.

After a time the deepest heart of the pine country is passed, and no more the heavy timber crowding close to to the roadside obscures the view of distant mountain chains and the nearer rugged hills. About 15 miles from Truckee a pleasant wayside house is reached—pleasant even in its rudeness—where tourists to Independence lake leave the Sierra valley stage. The lake is only three miles distant, a lovely sheet of crystal resting placidly in a deep hollow of the piney hills, but hidden from the view by the dense intervening groves. At this small half-way station near Independence lake the stages in winter stop for the midday meal, while in summer it is reached before 11 o'clock and only a short stop is made to water the horses and exchange the mail. After leaving Daily's dairy this is the first house built beside the road which winds its lonely path through that wild density of woodland left behind.

A few miles farther on a large sawmill is passed, with its huge piles of new clean lumber around it, sweet still with the piney breath of forests in them. A short stop to exchange the mail, and the stage is off again on the dusty road that winds a rugged way down the descending slopes; through openings in wayside thickets, framed by interlacing sprays thick hung with scarlet choke-berries, long chains of piney mountain ranges, blue and draped in pearly smoke, stretch away into the west. But soon these roadside brambles grow more dense as we descend into the flats, and the smooth road leads through deep, high walls that flaunt aloft long, dusty, whip-like branches spangled bright with glassy sun-kissed berries. Still farther on, a mile or so, and the scattering homes of Sierra valley rise to view, growing thicker and more pretentious until the stage rumbles up beneath the locusts that guard the hotel door, and broad noon reigns shadowless over the valley.

MAY BLOSSOM DAVIS.

Artesian Wells in California.

[By C. E. GRUNSKY, C. E.]

(Continued from last issue.)

Thus the two waters are prevented from commingling. The inner-tube supplies water for domestic use; the other fills a reservoir, from which an overflow pipe, 11 inches in diameter, leads into a well, bored down to a layer of gravel at some depth below the surface, and into this gravel the waste water is discharged and is greedily absorbed. The improvement of the well is a complete success.

It thus becomes evident that it is of great importance to prevent the opening of channels by way of leaks in the well-casing or along the outside of the casing from a pervious stratum, bearing artesian water, to one that is dry or carries its water under less pressure than that required to raise it to the surface of the ground.

The artesian-well casing in ordinary use is sheet-iron pipe, in sections two feet long. The casing is made double, consisting of inside and outside joints, which overlap each other one-half of their length. The ends of the successive inside and outside joints are supposed to fit snugly together. Horizontal seams of simple contact thus succeed each other at intervals of one foot along the casing, those of the inside member of the casing alternating with those of the outside member. All longitudinal seams are single-riveted, rivets being set about three inches apart. Perfect contact between inside and outside casing cannot be secured on account of the rivet-heads.

Such casing is not water-tight, and can only be recommended for use when only impervious material is encountered from the surface down to the artesian water. When under other circumstances such casing is used, the supply of artesian water must be ample to supply the loss due the leakage before it will cause the water to rise above the surface of the ground.

By removing the surface soil to a depth of about four feet around the casing of an artesian well in the Kern river delta and inserting a water-tight wooden box, there was as much leakage water caught in this box as rose to the surface within the well-casing.

The artesian well at Hill's Ferry, from which a water-supply for the town is secured, discharges its water at a hight of about eight feet above the surface of the ground. The stand-pipe in which the water rises is of galvanized iron, and is water-tight. The well-casing is of the kind in ordinary use. Leakage from it is so great that the water entering the surface-soil above a layer of firm clay, generally designated as "hardpan," rises to the surface and keeps two small ponds, now used as fish-tanks, well supplied with fresh water.

Other instances of loss of water through well-casing could be cited. It occurs wherever the casing above described is used, and may increase or decrease by reason of chemical action of the ingredients in the water on the iron casing. A peculiar example of the loss of water from a well-casing is the following:

At the old waterworks on Hunter street in Stockton, a well was bored in 1879. It is 1100 feet deep, and at the time it was completed had a good flow. Its flow, however, decreased gradually, and in 1884, when the well had ceased to discharge water, a well-borer was called upon to clean it out, it being presumed that sand had accumulated in it, to the obstruction of the upward flow of water. No sand was found in the well. It had retained its full depth. It was noted, however, that the water-surface in the well-casing was about five feet below the surface of the ground while the waterworks pumps were in action, drawing water from three wells within 12 feet of the artesian well, ranging in depth from 146 to 200 feet, and that its water-surface, as soon as there was an intermission in the pumping, rose to within one foot of the surface. This phenomenon explained at once the cause of the failure of the well. Its water all passed through the casing into the water-bearing strata from which the pumps were drawing water.

Two hundred feet of the casing was pulled up, and seams that had been greatly enlarged were discovered. In one joint there was a notch of one and one-half inches. When replaced by better casing the original flow of the well was restored.

Screw-joint casing, though much more expensive, is gradually superseding the double casing above described.

Sometimes the water-cap where it is perforated by a well is a very thin stratum, or lacks the firmness required to close in tightly against the well-casing. Under such circumstances, a part of or perhaps the entire flow of an artesian stratum may be lost, by an upward discharge of water outside of the well-casing into dry sands above the water-cap. When the depth of 800 feet was reached in a well bored for D. Rhoads, about two miles northwest of Lemoore, in the Kings River Delta, in 1885, a good flow of water was struck, which rose from beneath a water-cap of slushy, sandy clay only about six feet in thickness. Not to exceed 50 feet of firm clay, in a large number of layers, had been encountered in making this boring. The well discharged large quantities of sand with its water, and after a short time ceased to flow. There was no doubt that the fine sand at the bottom of the well gradually lost the power of sustaining the layer of soft clay above it, and, when the clay broke down and away from the well-casing, the artesian water found a capacious recipient in the layers of sand above it. By reason of the opening of this vent, its pressure was so reduced at that point that it could no longer rise to the surface of the ground. This well was subsequently deepened to 960 feet, but no other artesian flow was struck. A loss of water from artesian wells into pervious strata, which do not themselves bear artesian water, is not always the result of accident or defective casing, it is sometimes due to the ignorance or carelessness of the well-borers.

I know of an artesian well of small flow which had been only 335 feet in depth, and which was deepened in 1882 to 635 feet, in order to increase its flow. Eighteen strata of sand were bored through. They were separated from each other by firm clays. Some of the sand yielded artesian water in greater or less quantities, others, though wet, held their water at less pressure than that required to cause it to rise to the surface. When the full depth required was reached, the well-casing was perforated at each of the eighteen strata of sand, and the well-borer, as well as the well-owner, was surprised that the well did not yield as much water as had been indicated by the several separate artesian strata. It is to be hoped that by this time the well-borer, at least, has learned that water always prefers to flow in the direction of least resistance, and if a channel is opened from a well into any other body of water in which hydrostatic pressure is less than that of a column of water to the desired point of outflow, that its water will surely, in part at least, flow in that direction.

It frequently happens that the casing is carried entirely through the stratum from which a supply of water is to be taken, and that it ends at some point in the water-bed. To admit water, the casing must be perforated. Perforations generally consist of slits cut into the tubing after it is in place. If these be distributed from top to bottom of the water-bearing stratum, then, because water will naturally enter through all under equal pressure, the upward flow of water in the casing will be more rapid above the upper perforations than above the lowest one. Sand is likely to be brought in through the perforations, and it may be that the current caused by the lowest perforation is not sufficient to carry the sand upward. Some sand, therefore, sinks to the bottom of the well. It may accumulate in quantity sufficient to choke off the lowest perforation, and in time the next one above it, and so on, until possibly a copious flow is entirely sacrificed.

In answer to the question, which is often asked, "Shall all the strata bearing artesian water be tapped, or shall the weaker flows be excluded?" I have to say that by tapping any stratum from which water rises above the proposed hight of water-delivery, with the friction-head for velocity from the strong flow added, the discharge of the well is increased; but it is not policy to tap any weak flow if one or more strong ones have been struck. A slight decrease of the pressure in the stratum which yields only a small amount of water (and such decrease must always be expected) may decrease its hydrostatic pressure to less than that required to produce velocity to overcome friction and to raise it to the point of outflow; and as soon as this occurs, a flow of water from the well into the stratum of weak flow will result, and a loss of water occurs that it will be extremely difficult to detect or to check. If water is admitted into a well from a number of strata and the lowest flow is a weak one, then it frequently happens that the sand brought in through perforations in the upper strata sinks and chokes off the lower flow. The water from the next artesian stratum may be lost in the same way, and so on, to the great injury of the usefulness of the well.

When once the borings in any locality have determined, approximately at least, the relative amount of flow from different depths, it is always wise to adjust diameters of tubing to amount of water expected; for no sand deposits will ever occur in the tubing of any well from the bottom of which water rises upward with a velocity of more than two feet per second.

From the practical application of what I have here set forth, it follows that the amount of water that can be secured from any stratum which yields artesian water is limited, and that there must be an interdependence of all wells which draw upon the same source for their supply.

In some localities where this interdependence has been established by practical experience, as at San Bernardino and in the county of Santa Clara, it is required by law that wells be capped when water is not in actual use. Every artesian well when opened reduces the hydrostatic pressure of the water in its immediate vicinity at once, and a consequent reduction of pressure gradually extends to the extreme upper edge of the subterranean reservoir; but with distance from the well, the effect decreases.

So slowly does water sometimes move through its subterranean passages, clogged as they are by sands and gravels under great pressure, that it may be years before the effect of the reduction has ceased to extend. It is not a frequent occurrence, then, to note an immediate effect upon the flow of any well when another is sunk to the same stratum. Changes in the amount of flow due to such cause usually extend over such long periods of time that they are not readily detected.

I measured the flow of about 100 artesian wells in Tulare county in 1884. Of these, 20 had been examined by me in 1882. Two of the deep borings, which were discharging water above the surface of the ground in 1882, had ceased to flow altogether in 1884. Both of these were near the eastern or upper edge of the artesian-well belt of San Joaquin valley. One of these had been sunk in 1878 and maintained a good flow until 1882, after which time—while the number of wells in the vicinity was being increased from 20 to about 100—it gradually failed, and ceased to flow entirely in the summer of 1884. The other was sunk in 1882, and its flow was then about 18,000 gallons per 24 hours.

The flow of 12 other of the 20 wells that were thus visited twice had in each case decreased. The aggregate flow of the 12 wells in 1882 was 272 miners' inches; two years later it was only 114 miners' inches, showing a loss of 56 per cent in two years. Yet the decrease had been so slow that but few of the well-owners would admit that a material change had occurred.

It cannot be hoped to establish the interdependence of wells in artesian belts of such great extent as those of San Joaquin valley by means of experiments made in capping or uncapping wells. The great time required in producing an effect must needs make it impossible to establish with certainty a connection between cause and effect.

This effect is necessarily small even when two wells are close together and are known to draw water from the same source. It is precisely the same as when two relatively small hydrants are connected by means of two separate pipes with a common large water-main. The closing of one produces no perceptible effect on the other, because the hydrostatic pressure in the main is barely affected by opening or closing so small a vent. Yet, as every one knows, the many taps and hydrants distributed throughout a city provide escape-ways for the entire water-supply in the city main, and all combined are limited in their discharge to the amount which from some source is supplied to the water-main.

Whenever the flow of an artesian well is checked, the hydrostatic pressure in the stratum from which it draws water is raised, and the longer the well remains closed, the nearer will the same approach to that pressure which existed before the well was sunk. To this fact is due the phenomenon of the increased flow whenever a well is uncapped. In some cases such increased flow continues for hours, in others for days or weeks, and there is no doubt that, after first being opened, an artesian well in the central or lower part of San Joaquin valley must flow for months before it settles to a constant or normal flow.

The long period required for such adjustment, which is in conflict with hydrostatic laws governing the flow of water in closed conduits, is due to the influence of the friction to which water is subjected in its flow through pervious formations toward the point of discharge.

Stratification is not so well expressed in Sacramento valley as in the San Joaquin valley. Clay beds of great extent have yet to be found. Without one to form a water-cap, no great development of artesian water need be looked for.

Beyond a doubt there are many points in Sacramento valley where artesian water exists, but unless some extensive deposit of clay be discovered at greater depth than yet attained at any point near the valley's trough, the artesian districts will be of small extent and their yield will be limited.

If clay beds analogous to those which dip westward in San Joaquin valley from the base of the Sierra Nevada foothills had been formed on some of the gravel deposits of Stony, Cache and Putah creeks to cap the water sinking from these streams, what volumes of flow from subterranean sources might not be expected on the west side of the noble Sacramento! But, far from yielding a satisfactory supply of artesian water, this great west-side plain is often almost barren of even soil water.

Within the last few years an experimental boring for artesian water was made near Red Bluff. According to the latest accounts which reached me, at the time the boring was in progress, there seemed to be little hope of success. The probability of failure would have been predicted by any one familiar with the conditions required to produce an artesian flow, even though no other facts had been known except that Red Bluff lies near the head of the valley.

The well-known fact that artesian water near the central part of our great valley rarely develops a pressure greater than 20 feet, guides the intelligent engineer in his advice when he cautions the inquiring that, though possible, it is not probable that artesian water will be struck on our plains near the base of the foothills.

The boring at Arcade 2160 feet in depth at a point about eight miles northeast of Sacramento, which was made at a cost of about $30,000, is invaluable in demonstrating the folly of boring high up on the plain for artesian water before the experiment has been tried nearer to the valley's trough. Here in fair Sacramento the experiments thus far made have been limited to depths of less than 600 feet, and they indicate that there is but little hope of finding a continuous bed of clay, even at greater depths, and without such a bed of clay there will be no spontaneously flowing water.

At a point about four miles north of Chico a well was sunk to a depth of 686 feet without striking artesian water.

The well at the Woolen-mills at Marysville is 306 feet deep; another in Sutter county, about 16 miles southwest of Marysville, is 360 feet in depth. Neither of these flows. Many water-bearing strata were found in the latter, but the water not only did not flow, but it is strongly impregnated with mineral matter.

At Norman, in Colusa county, where the surface of the ground is only about 20 feet higher than the lowest point of the valley trough, artesian water, a very weak flow, was found at a depth of about 1000 feet.

The water-works well in Woodland is 600 feet in depth. The only good water-bearing stratum there found is at a depth of 155 feet, and from this alone is water drawn by the pump.

The La Rue well, about three miles west of Davisville, though 200 feet in depth, supplies very little water, which rises in it to a point about 17 feet beneath the surface of the ground.

About four miles east of Woodland are two periodically flowing wells. Their discharge, which is very small, continues for about nine months of each year, then ceases. One of these is 180 feet in depth; the other 204 feet.

At Isleton, at the California Beet-sugar Manufactory, water of a well 106 feet in depth rises to within four feet of the ground's surface.

As early as 1858 the celebrated Court-house well at Stockton was completed. From notes by Charles D. Gibbes, it appears that a stratum of clay, sand and gravel at a depth of 92 feet contains traces of gold. At 340 feet, in a 14-feet-thick layer of sand, a redwood log was bored through. At 560 feet, water that would flow spontaneously, and which would rise five feet above the surface, was found; a better flow was struck at 913 feet; and the best, with which the boring stopped, was found at just 1000 feet, beneath 11 feet of firm clay. In a stand-pipe, water rose 11 feet above the surface of the ground, and the gas which collected in the pipe above the water would burn with a flame about 18 inches over the top of the pipe.

The discovery had thus, very early, been made of a subterranean source of gas, but, until recently, no benefits have resulted to Stockton from this discovery.

(To be Continued.)

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

UNION AND PAUGH MINES.—*Dispatch*, Nov. 9: A large body of ore was struck in the old Paugh quartz mine at Irishtown, at a distance of 375 feet from the mouth of the main tunnel, which came in contact with the old workings, which was done some 18 or 20 years ago in the shape of a tunnel which was run its entire length in quartz along the vein or lode. The present company have run some 50 or 60 feet along the lode and crosscutted, with the result of finding it from 15 to 18 feet in good paying ore and carrying a large percentage of sulphurets. The rock is estimated to pay milling process from $8 to $10 per ton, not including the sulphurets, some of which are very rich, especially the galena, of which there is a large percentage. The work on the mines is progressing nicely, the company sparing no expense both to prospect and also to put the mines on a paying basis when properly opened. On first striking the old works of the Paugh mine, 2000 inches of water burst into the main tunnel and run steadily, the average discharge of water being from 3½ to 4 inches from the Paugh mine. As there is no connection with the Union as yet it cannot be told what the discharge of water is. The mines have a very fine location, the formation being slate and greenstone.

THE MCKENZIE MINE, which is located one-half mile southeast of the Union and Paugh mines, is running in full blast, employing quite a number of men and keeping the mill running steadily on rich ore.

SUTTER CREEK.—Cor. Amador *Ledger*, Nov. 6: There is renewed activity noticeable about the mines. Mr. Stewart has got the ore bin at the Lincoln almost full of rock, and the mill will be started in a day or two. The Wildman is moving along in its usual groove of prosperity, improving gradually right along. Their winter supplies are nearly all in. The Sutter Creek mine, which is under lease, is running in good shape, and the lessees expect to make it pay well this winter.

Calaveras.

RICH STRIKE.—Angels *Echo*, Nov. 7: An immensely rich strike was made in the Cloud quartz mine, situated near Albany Flat, some two miles south of Angels. This mine was located about four years ago, but was not prospected to any extent until recently. The shaft in which the bonanza was uncovered is about 18 feet deep and the vein or ore body is over four feet in width. Average specimens of the ore have been assayed, none of which yielded less than $103.35. It is the intention of the owner, Mr. Otto Dolling, to ship a few tons of ore to the smelting works at San Francisco when big results are expected. The ore contains at least 60 per cent of sulphurets. The specimens shown us are indeed exceedingly rich, and in our judgment, would, by the ordinary process of milling, yield from $400 to $500 per ton.

PEET.—We understand that the Peet mine is making a splendid showing. Mr. Peet is working it on an economical scale, and will, we think, in the end realize a fortune from it. If pluck, energy and push goes for anything, Mr. Peet is entitled to success.

GOLD CLIFF.—The mill at the Gold Cliff mine has been thoroughly renovated and twenty stamps were put in motion last Monday. This mine has been lying idle for several years, owing mostly to bad management. The ore is of a low grade, but the facilities for extracting as well as milling it are unsurpassed.

Inyo.

A RICH REGION.—*Index*, Nov. 6: Messrs. Hannigan & Gallagher, who have been prospecting in Panamint district, are in town. They say the country is rich in gold, silver and other minerals, and the advent of the proposed railroad will open up the most extensive and most promising mineral belt on the Pacific Slope. Speedy and cheap transportation is all that is needed to develop and make it a large producer of precious metals.

El Dorado.

CEMENT GRAVEL MINES.—Placerville *Observer*, Nov. 12: The general mining outlook of our county seems to be decidedly encouraging. The Sierra Water and Improvement Co. are making extensive developments on their mining property in several places. From the 700-foot level at the Pacific shaft they have about completed a crosscut drift to strike the Rose ledge, several hundred feet west, where a large body of ore of good grade is known to exist. They keep their 20-stamp mill running from the works on the Pacific ledge. At the Linden mine they have a large body of cement gravel of excellent grade, and keep their 10-stamp mill going day and night. At the Rogers mine they are now running on a bed of good cement gravel, two and a half feet thick, from which their 10-stamp mill is kept constantly running. Supt. Coughlin considers the mine in a more promising condition now than at any time since he has had charge of it. The Chili Ravine cement gravel mine is showing better than it has for many years. They have now a fine bench of gravel in the tunnel from the Chili ravine side, from which they keep the 10-stamp mill running regularly. At the Bassett cement gravel mine at Weaver hill a new tunnel has been run in to strike a lower vein channel, the gravel in which is showing exceedingly well, yielding as high as $6 to the pan. The channel from which the rich gravel is now being taken out at the Cedar Ravine mine, evidently runs through the Bassett claim, and it is possible that Mr. Stewart, (the owner) may be on an outer vein of this channel. Work at the old Granite mine at Smith's Flat is being prosecuted with vigor and fair results are being obtained. The gravel being extracted is too hard for ordinary sluice washing and in order to work it thoroughly, some kind of reduction works will be required. The owner is making encouraging developments at the Gentle Annie mine, at Poverty Point. Openings already made show a continuous vein of soft material, containing gold which prospects to pay from $4 to $6 per ton, for a distance of 1200 feet along the vein, showing a width of about 20 feet, and from the level of a point where a mill can be erected, will give backs in some places to the extent of 120 feet, and the mine worked as an open cut to that level, as the material pays from top to bottom. It is reasonably estimated that there are over one hundred thousand tons of this ore in sight, above the level of the proposed mill-site, which can be worked without sinking on the vein. This mine can be worked so very cheap that it must become of great value, and the large amount of available ore will justify the construction of large reduction works. The sulphurets contained in the ore are very fine and assays prove them to be valuable.

Nevada

REOPENING AN OLD MINE.—*Tidings*, Nov. 9: Superintendent Stoddard of the Hartery mine informs us that there were perhaps 100 miners at his office when bids for contracts were opened Saturday. Morris Lynch & Co. will drive the No. 1 level, north, 100 feet, for $3.72 a foot. Samuel Curnow & Co. will run the No. 2 level, north, 100 feet, for $3.42 a foot. Joseph Rodda & Co. will receive $3 a foot for driving No. 2 level, south, 100 feet. The three contracts will give employment to 12 men. The highest price bid was $8.50 a foot. In addition to the 12 contractors, the mine has 27 men at work on day's pay. Twenty-five additional tributers will go on within a week. In the meantime the mine will be developed, and 50 men will be subtracted from the idle element. It pays to reopen old mines.

KAOLIN.—*Tidings*, Nov. 7: A vase standing six inches in hight, supported by two columns and the whole neatly embellished with artistically wrought designs, was laid on our table at noon by Mr. D. D. Thrasher of Limekiln. The vase was carved out of a block of kaolin by the donor. Mr. Thrasher stated that the kaolin of which the vase is composed was taken from a large bed of the material discovered on the Golden Gate mining claim, situated 2½ miles from Limekiln and owned by Messrs. Levi Sanford, Alex. Ridinger and himself. The kaolin was first struck at a point only five feet from surface and was mixed with a "gritty matter." A shaft was put down 30 feet, and the pure kaolin discovered. The bedrock is supposed to be porphyry. It is not known how extensive is the find, but a shaft sunk 100 feet distant also reveals the bed. Messrs. Thrasher & Co. have a quartz ledge on the Golden Gate claim that is from 6 to 8 feet in width, ore from which has yielded at the rate of $6 and $8 per ton by mill process.

BRIEFS.—There are 22 men at work on tribute at the Hartery and more to go on. About one-half of the Idaho miners have been laid off pending the repairs in the mill. It is likely that the remainder of the force will also enjoy a brief enforced vacation. The men may be out a fortnight. The Peabody machinery has not yet been started up. After repairing the wheel, the foundation of the hoisting machinery was examined and found to have rotted badly. New timbers are being put in, and it is anticipated that operations will be resumed Monday. Messrs. Geurne & Gamble, the Santa Rosa gentlemen who have a bond on the Good Hope mine at Cabbage Patch, have returned from a visit to the property and express themselves as well satisfied with the outlook.

A RICH RIVER CLAIM.—*Transcript*, Nov. 7: J. Wood, who has been working the Hathaway river claim on the South Yuba, a short distance east of Washington, brought down with him Tuesday a magnificent collection of nuggets ranging in value from $3 to $40 apiece. The mine is an old one and has produced much wealth in years gone by; but Mr. Wood found unworked spots that paid on a '49 basis. It is claimed that one pan of dirt from a crevice yielded over $600. There is yet in the hills and vales of Nevada county five times as much gold as has ever been taken out.

COMING TO THE FRONT.—*Tidings*, Nov. 13: A clean-up from 57 tons of ore from the W. Y. O. D. mine has just been completed at the company's mill, and the yield is $18.70 per ton. Ore of this grade is highly profitable, as the cost of extraction is minimized by the size of the ledge and the comparative softness of the ground even at the depth of 500 feet. The drifts at this level are being driven with profit, and the vein in the shaft, which is being sunk for the 600 level, affords the most encouraging indications.

GOLD POINT.—Grass Valley *Union*, Nov. 9: The new dry-house and blacksmith-shop at the Gold Point, to take the place of the one destroyed by fire some time ago, has been completed. Underground work has also been resumed. The vein in the drifts and stopes is very strong and is of good milling quality, as proven by several large crushings of the ore which have been made. The company have in contemplation important improvements at the mine.

GOOD ORE AT THE PITTSBURG.—*Tidings*, Nov. 9: There are now 30 men at work at the Pittsburg, on day's pay and tribute. In the three weeks in which Supt. Stocks has been in charge the shaft has been sunk 25 feet. Tests of ore, made Friday, indicate that the quartz will yield $20 a ton. Mr. Stocks is hopeful of developing the Pittsburg into a profitable property.

Placer.

TWO OF OPHIR'S MINES.—Placer *Herald*, Nov. 9: Work is progressing satisfactorily at the Eclipse mine. The main slope is down 100 feet and is timbered for that distance. It is 4x8 feet in the clear and is timbered with sawed lumber. The hoisting works will be finished the latter part of next week. The hoisting will be done by water-power. The water is taken from a branch of the Bear River ditch, and for the last 1000 feet will be run through a pipe upon a four-foot Pelton wheel. The mill will be 46x100 feet. The battery will at first contain 10 stamps, but will be increased to 20. The stamps will also be run by water, at a pressure of 165 feet. The ledge has been prospected by shafts for 600 feet of its length. These prospect shafts are from 40 to 150 feet in depth, and the rock taken from them has paid from $18 to $125 per ton in free gold. The ledge occupies all the space from the incline to the eastern shaft. There are two other ledges running diagonally in an easterly direction to the main ledge, which runs in a northwesterly and southeasterly course. These three ledges unite below the surface. The ledge is of "ribbon" formation and has an inclination of 35 degrees. The company is well satisfied with the prospects and will make a thorough test of the ledge. Twenty-five men are employed. The mine is in charge of J. B. Patterson.

THE HATHAWAY.—A visit to this mine shows that it is paying well. S. D. Valentine, one of the owners, and G. T. Taylor, the superintendent, both wear a smiling look when questioned, and a look at the ore reveals the cause of their satisfaction. Forty men are now at work there, and more are being put on as fast as room can be made for them. The principal part of the work is now being done in the lower level (250 feet down). A few men are at work at the 50-foot level. The lower level pays the better, and there is every indication that the rock will become richer as they go down. The rock has the same appearance as in our last report. Twenty stamps are run day and night. The output is a carload a month of the slick or slime from the sulphuretted ore. The output will be increased when the concentrators are put in. The company intend to put in four Woodbury concentrators. The old-fashioned blankets have been used since the mill has been running, and have, from tests made, saved all the gold but 35 cents per ton. This is close working, but the concentrators are cheaper to work and will handle more material than the blankets. By means of the concentrators two carloads of slime will be caught each month. This slime is shipped to the smelting works in Denver. It averages about $150 per ton. Some of it has paid $729 per ton in gold and silver. The cost of shipping it that distance is $30 per ton. The rock also yields good returns in free gold.

Plumas.

THE LITTLE JAMISON.—*National*, Nov. 2: At a meeting of the stockholders this company accepted a proposition of compromise, made by the Daly interest. This stops all litigation and combines the two titles. The mine is one of the very best prospects in the State of California, the ledge being very wide and extremely rich. A 1600-foot tunnel will be started soon, which taps the ledge at a depth of 100 feet. As soon as the ledge is cut, a mill will be placed upon the premises, and then we may expect to see a second Eureka.

Shasta.

NOTES.—Shasta *Democrat*, Nov. 6: The Little Nellie mine in the Iron Mountain district has been sold to Mr. Hart of the Texas and Georgia. The Riley & Bliss mine, we are informed, has again started up under the superintendency of a Mr. Roberts, an expert miner. Shasta county is attracting considerable attention abroad to her mines. Experts are arriving every day, and prospecting is extensively carried on. The Calumet mine is receiving a large quantity of machinery for its new plant. One of the pieces is an immense pulverizing barrel of 20 tons capacity.

IGO.—Cor. Shasta *Courier*, Nov. 9: At the Crystal they are drifting from the shaft. About a carload of high-grade ore is on the dump, and more coming out every day. At the Chicago they are timbering the old shaft near the surface before sinking deeper. The owners of the North extension now talk of opening their claim in the spring. The shaft at the Red Warrior is being sunk deeper, and some good ore found. A shaft is going down on the Gem—the gold ledge near Muletown—on the Igo side of Clear creek. The gold is in the sulphurets, which are rich enough to satisfy the owners. The Muletown ledges are turning out well, Doc Dunham's particularly so. J. P. Wright has bonded his sulphuret ledge to the Chicago folks; and it is being followed into the hill with promising results. Mine claimants on Section 10 are being put to some trouble on account of would-be purchasers of the same as agricultural land. Excepting a few acres in the southwest quarter, it would seem to be a stretch of imagination to call it agricultural—"barren and worthless" would hit the mark so far as anything but mining is concerned. Shirland's arastra is running on a large deposit of pay granite filled with small rich ocher seams. The general average is quite satisfactory. E. L. Ballou's arastra is running on Hope ore. Considerable prospecting is being done in various parts of the district.

FROM FRENCH GULCH. — Several of the quartz mines were compelled to cease operations during the storm, but have resumed work again. The new America mine on east fork of Clear creek has been bonded to San Francisco parties for $15,000.

Sierra.

GOLD VALLEY.—*Mountain Messenger*, Nov. 9: The Garibaldi mine is running its 5-stamp mill at Gold Valley, and the owners appear to be well satisfied with their prospects. This mill is on the East Fork nearly two miles from the mine. The ore is transported from the mine to the mill on a wire rope of two spans, each span of which is about one mile long without any support. The ore is dropped at the center station and picked up and carried on again. We believe this is the only tramway of the kind in the county. Mr. Giles H. Gray, the owner of the Empire mine at Gold Valley, informs us that several men will be kept at work this winter running ahead to develop the ledge. There is a great deal of good ore now in sight in the mine, but Mr. Gray is anxious to place its prospects beyond question before he builds a mill, which will be next summer, if things continue to look as well then as now. This mine was located and worked away back in the '50s, but the rock was considered rebellious. The ore is not so considered now, because its nature is better understood.

WILLOUGHBY.—The owners of the Willoughby mine, near Gold Lake, are industriously at work putting up a mill, and if the weather holds good for a few weeks, will have it running. The company is sanguine of a good mine and is putting up its buildings in the most substantial manner. Three tunnels have been run on the ledge, the lowest 500 feet long, and in good ore. Those competent to judge say the property is very promising.

CLEAN GOLD.—In our last issue we spoke of Grant and Apple taking out 100 pounds of quartz, mostly gold. We wish to amend by saying that they took out 100 pounds of gold dust cleaned as clean as gold is usually cleaned. It does not set us back any to make a correction of this kind. The boys deserve their good luck.

JERSEY.—Sierra *Tribune*, Nov. 8: Work has been commenced at the Jersey mine, situated a short distance northwest of the Young America. They have a well-defined ledge, showing free gold in considerable of the rock. It is the intention of the company to put up a small mill at the mine in the spring.

San Bernardino.

THE BLACK HAWK MINES.—*Courier*, Nov. 9: From the report made by Mr. Rising we take this concerning one of the best mining districts in the county, the Black Hawk: This district is situated about 35 miles from the California Southern railroad, with Hesperia and Victor for its stations. It was found some two years ago, after the important discoveries made by J. B. Cook and O. G. Leach, two intelligent prospectors well known in this county. J. B. Cook is the recorder for the district. The Black Hawk mines (23 in number) with water rights, have been formed into one company called the Black Hawk Gold Co. of Los Angeles. This company's mines are all in one body, an immense canyon having cut the ledge for some two miles in length, exposing an ore body past description. There are exposed on this ledge some six ore bodies, ranging from 400 to 1000 feet in length and varying from 30 to 100 feet in width, the whole mass carrying free gold and assaying from $4 to $500 per ton. Some experts value the whole body at from $10 to $12 per ton without assorting. There are two tunnels of 100 feet each run in ore, and numerous cuts, drifts and openings all along the ledge at various points, all showing free-milling gold ore.

San Diego.

JULIAN DISTRICT.—*San Diegan*, Nov. 7: Developments at the Helvetia mine are reported to be very satisfactory. Messrs. Murray & Smith are in possession. They have run a tunnel 200 feet in length to a connection with the old works, finding everything just as stated by old-time miners, and have at the connection of the tunnel with the old works a fine body of ore in sight, but it will require some timbering before it can be stoped out, as the ground in the old works is somewhat treacherous; the timber will soon be on the ground for the work. They have just completed a good wagon-road to the mine for the purpose of supplying timbers and wood, and are now down nearly 100 feet on a new shaft, and have followed the ledge all the way from the surface; the ledge is getting larger and larger as they go down; work is being pushed day and night in this shaft, and it is the intention to sink to a depth of 300 feet before doing any stoping or drifting. They now have about 50 tons of good-milling ore on the dump. Hoisting machinery is being purchased, and a crew of men is now at work leveling off the ground and preparing for the same. Another force of men is grading off the hillside for a mill, which it is the intention of the owners to erect at once; a portion of it has already been received, and the balance will arrive shortly.

Siskiyou.

GRAVEL AND QUARTZ.—Yreka *Journal*, Nov, 13: Jillson & Co. at Henley are now able to get three or four hours' supply of water each day to run their giants under 300-foot pressure. With more rain and snow they will be able to accumulate sufficient during each 24 hours to run longer every day. They have very rich ground in the famous blue gravel lead on the Klamath river at the mouth of Printer gulch, and with a good supply of water will be able to secure a great amount of the glittering ore. The manager of the Warren quartz-mill on Yreka Flats expects to start up the mill again in a short time, or when the donkey engine is brought back from the new sawmill at Klamath City, where it has been used for running a saw in making pulley blocks. McCook's quartz-mill at Forks of Humbug is to be started up again in a few days, to be run by a steam engine purchased from W. D. Shelly of Scott valley. Hutchins & Clark of Humbug creek have taken out about ten tons of quartz from a new ledge they have lately discovered, and will take it to mill this week to be tested. Mr. J. F. Boyle has shipped his new quartz-mill from San Francisco, comprising a carload or more of machinery which will be hauled from Yreka to Humbug this week. It is of a different style from any used in this county, and of the class used in Arizona with the greatest success.

Trinity.

STRUCK IT GOOD.—*Journal*, Nov. 9: The Ridgeway Mining Co. of New River have struck the ledge they have been running for, and found it 6 to 10 feet wide and sufficiently rich to pay handsomely. The tunnel is over 700 feet long and taps the ledge at a depth of 200 feet. This is the most encouraging of anything that has come to our notice since the camp first started up. This proves that the ledges go down and retain their paying quality. We congratulate Messrs. Dean and Toms on their success and brilliant prospect for future operations.

CANYON CREEK QUARTZ.—W. J. Grigsby was in town this week, and informs us that his prospects on Canyon creek are looking first-rate. With Ed Shock he has eight locations, all of which carry free gold and look well for the amount of work done. They have put up an arastra and will be crushing ore in about a week. The arastra will crush ore from the Buck Ranch mine, on which is a ledge 14 feet wide that prospects well—the quartz is good milling ore. They will begin right away on a 100-foot tunnel, to tap the ledge at a depth of 80 feet. They will develop the mine this winter and crush the ore taken out, so that by next spring they will have made a fair test of the property. Mr. Grigsby is very sanguine in regard to the outcome of the mines on Canyon creek, and says that there are undoubtedly some very rich ones there. In prospecting for ledges he found places where he could get 25 cents to the pan. The indications point to a first-class camp on Canyon creek.

Tuolumne.

SUMMERVILLE.—Cor. *Independent*, Nov. 9: The Mother Lode mine, formerly New Albany, still continues to make valuable developments under the efficient management of Mr. Whorf, the gentleman in charge. Water is expected soon at the Consolidated Eureka, when everything will be started again in full blast. There has been considerable and very annoying delay in its coming, but still it is better late than never. The town has been very quiet of late, and a return to its accustomed liveliness will be very welcome.

NEVADA.

Washoe District.

UTAH.—Virginia *Chronicle*, Nov. 9: On the 600 level the southeast drift is advanced 222 feet from the shaft station. Formation hard porphyry. Have repaired 110 feet of the main south drift.

OCCIDENTAL CON.—During the week extracted and milled 300 tons of ore showing an average assay value of $21.04 per ton.

NORTH OCCIDENTAL.—Extracting ore from the 300 and 400 levels. On the 300 level a south drift is advanced six feet from west crosscut No. 2 and is in ore of a fair quality.

CON. CALIFORNIA AND VIRGINIA.—From the stopes of the 1300, 1435, 1500, 1600 and 1650 levels continue to extract ore sufficient to supply the Morgan and Eureka mills. On the 1950 level operations are suspended, the ore in the south drift having

pinched out. During the week 1067 tons and 370 pounds of ore were shipped to the Morgan mill, 1216 tons and 490 pounds to the Eureka mill. The average assay value of all the ore worked at these mills during the week, according to battery samples, was $27.10. Bullion valued at $140,335.17 shipped to San Francisco during the week.

GOULD AND CURRY.—On the 200 level, the southwest drift is extended 98 feet. Formation soft porphyry. On the 400 level west crosscut No. 1 is extended 454 feet. Formation porphyry.

BEST AND BELCHER.—All work on the 550 and 1000 levels for the past week was confined to repairs.

SIERRA NEVADA.—On the 520 level from the main east drift, 1185 feet from the shaft station, a south drift is advanced 480 feet, continuing in porphyry.

UNION CON.—On the 1405 level the north lateral drift is advanced 605 feet, and has reached the north line of the mine.

MEXICAN.—On the 1465 level from north drift from west crosscut No. 1, 50 feet in from the lateral drift face, a west crosscut is advanced 87 feet. Formation porphyry, clay and a little quartz.

OPHIR.—On the 1300 level the east crosscut from the shaft station, to connect with the top of the raise above the 1465 level east drift, is extended 315 feet, continuing in porphyry showing some quartz.

SCORPION.—The 520 level south drift is out 400 feet and is showing vein matter.

SAVAGE.—Shipped 320 tons of ore to the Rock Point mill. Stopes yielding as usual.

HALE AND NORCROSS.—Shipping 150 tons of ore daily to the Nevada mill. Explorations progressing as usual without any notable change in formation.

CHOLLAR AND POTOSI.—Crushing 60 tons of ore daily at the Nevada mill. The 500 level northwest drift is in low-grade quartz.

NORTH GOULD AND CURRY AND EAST BEST AND BELCHER.—The west drift from the northwest drift is showing vein matter.

IMPERIAL.—The joint Confidence-Challenge 500 level north drift is out 1140 feet from the Yellow Jacket shaft. The face shows porphyry and quartz. The west crosscut from this drift is in the same material.

YELLOW JACKET.—Daily ore shipments continue to average from 65 to 70 tons, battery samples showing an average assay value of $24.75 per ton.

ALPHA.—Opening a station on the 600 level. The 500 level west crosscut is showing quartz and porphyry.

CHALLENGE CON. AND CONFIDENCE.—Advancing the 500 level west crosscut, which shows quartz and porphyry in the face.

OVERMAN.—Shipped 352 tons of ore to the Vivian mill during the week.

CALEDONIA.—West crosscut No. 2 is in 118 feet. Advancing a southwest drift on the same level.

CROWN POINT.—A raise above the 400 level west crosscut is showing quartz of milling grade. An east drift from the bottom of the winze below the 800 level is showing spots of ore. The 900 level south drift is reopened 574 feet. Repairing the incline below the 1400 level.

BELCHER.—No. 2 east crosscut on the 1200 level continues in soft porphyry. East crosscut No. 3 continues in low-grade quartz. The 1000 level east crosscut is in porphyry and low-grade quartz. The 850 level south drift is in porphyry and quartz. The 200 level west crosscut has tapped a slight flow of water.

SEG. BELCHER.—The 1200 south drift from the Belcher is still showing streaks of quartz.

SILVER HILL.—The 160 level east crosscut is in porphyry. The 260 level northwest drift continues in porphyry.

JUSTICE.—Crushed 213 tons ore, assays showing a value of $24.67 per ton.

ALTA.—Crushed 320 tons of ore, assays showing a value of $31 per ton. Opening the 1030 level station is nearly completed.

NEW YORK CON.—Fair-grade quartz is still showing in the raise above the 800 level crosscut.

Ely District.

A TIMELY WORD.—White Pine *News*, Nov. 9: Letters of inquiry come pouring in on us from miners and persons anxious to engage in business as to the prospects for them here. To all such we must answer: There is not now, nor is there likely to be this winter, any demand for miners or other workmen, and as for business, the field is amply supplied. Mr. Watson is now working only about a dozen men in both mill and mine, and he does not intend to increase this force. What this district needs at present is capital to take hold of some of its promising mines and open them up. Until this is done, the field for both labor and business here will not materially expand.

Jumbo District.

SHIPPING ORE.—Virginia *Chronicle*, Nov. 5: Josephine is the name of a mining location in Jumbo district, which, the *Chronicle* is reliably informed, promises to prove as prolific in gold bullion production as the Pandora, which latter joins its boundary lines. The locators and owners include the following veteran local mine experts: William English, William Woodward, Hon. William Wootburn, H. Clements, and James Loughran. The location is usually designated as the Water company's claim, from the fact that three of the owners are attaches of that company. L. S. Coffin is about to make an ore shipment from the Pandora which, if careful assays are reliable, will produce larger gold bullion returns than any heretofore extracted from the mine. The value of the ore can be inferred when it is stated that it is carefully sacked to prevent the loss of any particles in transit. The owners of the Blizzard location are also shipping ore to one of the Six-mile Canyon mills. The Dunlop mill is dropping its five stamps on Wild Goose ore and the prospect is promising of a profitable cleanup in gold bullion. The mill crushes about seven tons in 24 hours.

Morey District.

RICH ORE.—Belmont *Courier*, Nov. 9: From County Assessor Charles McGregor, we learn that the lessees of the Morey mine are taking out rich ore. The lease will end in two months. Mr. H. A. Cohen is pushing the work of development west of the lessees' ground, and the mine is looking splendid at this point. He has ordered three concentrators which will be used in concentrating some of the ore of that district. There are 40 men working in the mines of that camp. Mr. McGregor feels confident that Morey will be a booming camp in the near future.

Tuscarora District.

BELLE ISLE.—*Inter-Mountain*, Nov. 8: West crosscut on the 250-foot level extended 18 feet, passing through vein matter.

NAVADA.—The stopes on the west vein above the 150-foot level are looking better. The usual amount of ore has been sent to the ore-house.

NORTH BELLE ISLE.—The shaft has been sunk and timbered 14 feet, total depth below the 400-foot level is 195 feet. Water flow about the same. Concentrator still running satisfactorily.

NORTH COMMONWEALTH.—Joint crosscut, 225-foot level, extended 11 feet, face looking favorable. South drift on the same level extended 21 feet, total length 62 feet, face still producing high-grade ore.

DEL MONTE.—East crosscut No. 2, 100-foot level, extended 12 feet, total length 68 feet; face continues to show high-grade ore.

GRAND PRIZE.—400-foot level: Winze in the east drift from the north crosscut has been sunk 16 feet; ore 3 feet in width. In the ground, above the east drift, being stoped for the extraction of concentrating ore, a 2-foot streak of $400 ore has been encountered, which promises to develop well. Other stopes yielding as usual. Everything at mine and concentrator running well.

COMMONWEALTH.—100-foot level: North drift has been extended 17 feet; total 245 feet. A crosscut has been started near the face to cut the ore on the east side. No. 1 east crosscut, from north drift, has advanced 12 feet; total, 75 feet. The ore continues to look well, being solid and of high grade.

ARIZONA.

GOLD ORE.—Mohave *Miner*, Nov. 9: E. E. Tourtellotte will next week put through an arastra about a ton and a half of gold ore (mostly specimens) from the Harrison mine near Cerbat. At the Rip Van Winkle, Layne Springs, Sample & Jamison are taking out considerable good ore from the lower tunnel, which is being driven to the Nighthawk line, some 50 feet yet to run. Chas. Cummings has six men at work in his mine at Wallapai Springs. The ore streaks are small and irregular, but of high grade. The mine is down about 100 feet, yet something over $19,000 has been extracted. E. F. Thompson and G. W. Beecher made a trip to the Empire mine, Chloride, the first of the week. The mine is looking better than ever before, and Mr. Thompson will not cease drifting, nor in fact do any other work until the extent of the ore body is known, when such arrangements as are justifiable will be made for its extraction. There are about 50 tons of fine ore on the dump. C. H. Park is in from the Queen Bee, Mineral Park, and reports the mine as looking better than ever, and producing some very high-grade ore. There is a force of nine men employed; the south drift has attained a length of more than 200 feet, and is still in good ore, and a winze is being sunk from this drift. Mr. Park will ship to-day to the Denver Public Sampler a lot of high-grade ore. The Arizona Sampling Works have worked since our last report the following lots of ore: N. C. Amer, 7½ tons high-grade ore from the Silver King; Robert Gray, one carload of low-grade ore from Stockton Hill; J. S. Crafts, a little over a ton from Hackberry; Brown, Rule & Kilburn, about four tons from the Rural mine; Burke Bros., two tons from the I X L; Marshal & Jamison, about nine tons; four carloads from the C. O. D.; De Bourdage, a small lot; Thos. Burch, a small lot from Cedar district.

COLORADO.

CLEAR CREEK GOLD BELT.—Denver *Republican*, Nov. 7: The Centennial mine has opened up two feet solid ore at the depth of 350 feet in the main shaft, which yields 80 ounces silver and 27 ounces of gold per ton. The workings of this mine are within the limits of Georgetown and it lies in the midst of the gold belt, commencing on the north side of Leavenworth mountain, running southeast across Burrell hill, Griffith mountain, the southeast slope of Columbian mountain and on toward the Lamartine and Freeland mines. The Pulaski, Big Injun, Burrell, Coatney, Gold and Silver Coin, Edna, Centennial, Griffith, Hood, Anglo Saxon Extension, High Girl and Lamartine are the developed paying mines on this belt. Much attention has been turned to it this last year. The Centennial has a depth of 350 feet below the level of the valley, while the Highland Girl and others are at the crest of the mountain, showing that the belt is strong, well defined and continuous throughout. The gold belt will add materially to Clear Creek's gold quota this year. The Big Injun mine, which the Exchange has listed, is just above the Centennial on Burrell hill.

ASPEN.—Much interest is felt here in the forthcoming silver convention, and Aspen will be well represented at that gathering. Every cent added to the price of the product is so much added to the net profit, and free coinage would mean an aggregate additional profit of something like $300,000 per month for the mine-owners of Aspen who are now producing from their properties, while a great number of mines would be made profitable that are now scarcely more than paying expenses. The Aspen and Compromise mines have not resumed their regular shipments, and it is not known yet how soon the management will be able to make satisfactory contracts for the output. In the meantime development is progressing very satisfactorily and both properties are looking wonderfully well. The fourth level of the Aspen has come into a fine body of ore near the southern end of the claim, while the old ore bodies are improving constantly. Senator Teller, who visited the mine last week stated that he never saw so much mineral exposed in one property during all of his 25 years' experience among the mines of Colorado.

BRITISH COLUMBIA.

THE COTTONWOOD MINES.—Kamloops *Sentinel*, Nov. 7: Mr. M. S. Davys, manager and shareholder of the Cottonwood gold mines, 7 miles from Nelson, Kootenay, has returned to Nanaimo after being away for the last six months. These mines are now closed down for the winter. Mr. Davys states they have been engaged all summer in extensive operations on the mines and putting in a 25-ton Huntington mill, which he intends to run in the spring. There have been 27 men working there all the summer, and the average output of rock has been 25 tons per day. He states there are a great number of American capitalists there who have bought many of the claims, and he states that Mr. Mackay, the famous Nevada operator, has also bought a few rich claims there and commenced to work them. There is plenty of water, so they experience no difficulty in washing the rock. There is also another ten-stamp mill being erected on the Eagle creek mine, owned by Mr. Davenport, which will also be running in the spring. Mr. Davys expects to employ about 200 men next spring, provided everything turns out as he anticipates. The claims of the Cottonwood Gold Mining Co. which they have been engaged on, are 4500 feet above sea level, and there is another claim called the Silver King, which is owned by the Kootenay Bonanza Mining Co., and is supposed to be the richest mine in the camp, which is 6000 feet above sea level. The Spokane and Northern Railway Co. are engaged in laying down a railroad which they intend to bring through Colville, where the trains are at present running; provided they can get the charter they intend to bring it into the Kootenay country. This will prove a great boon to the gold mines.

DAKOTA.

SYNDICATE SMELTERY.—Deadwood *Pioneer*, Nov. 7: Construction superintendent, Harry Damon, had a force of nine men working at site during yesterday. Grading and excavation necessary are already well under way. More men had been engaged but failed to show up, severity of the weather probably keeping them at home

DESIRE M. COMPANY.—A meeting of the directors of the above company was held last night, at which there were present Messrs. Wringrose, Coe, La Chapelle, Burns & Bonham. Reports of the treasurer and superintendent showed the company to be in good condition financially, and the mines looking well with every prospect of becoming self-supporting at an early date. The superintendent was directed to continue work until the annual representation work was completed, when it is confidently believed that ore shipment can be made.

IRON HILL.—The Iron Hill smeltery blows in today for another test run of dry or pyritic smelting. Length of the run depends largely upon success that is met, but in no event is likely to be more than 10 to 12 days. Pyrites for flux were obtained from a galena location belonging to William Delaney.

IDAHO.

ASSESSMENT DEVELOPMENT.—Ketchum *Keystone*: Nov. 9: J. C. Murray made a fine development while doing the assessment work on the Tenbrook mine, situated on the west fork of Warm Springs creek. This mine belongs to Hicks & Co., of Nevada, who have been working it several years and expended a considerable sum of money in explorations.

BLACK JACK.—*Avalanche*, Nov. 9: Messrs. Irvin, McKay and Little, the purchasers of the Black Jack and Empire State mines, are getting acquainted with all things necessary to the development of those mines. Six men have already been put to work by Supt. Dewey in the upper works of the Black Jack. Contracts for furnishing wood and running the tunnel from Blue gulch to cut the Empire State and Black Jack mines are being made, and ere long the west side of Florida mountain will present a lively appearance.

GARFIELD.—We are credibly informed that Mr. H. C. Anchor, the lessee of the Garfield mine, is now running a drift on the lode above named, and that he is extracting a good quality of ore. It is large, easily worked, and will prove of great value.

THE DE LAMAR.—The mill at De Lamar still continues to run on Wilson ore, not having shut down since it started up about two weeks since, and we understand that the mill will be kept running as long as a stamp can be lifted, except while cleaning up.

THE SOMMERCAMP.—The group of mines at Wagontown is showing up splendidly—good ore being found wherever a drift on the lode is run. Mr. Sommercamp superintends the working of them himself, and of course works to the best advantage, and is opening a fine property.

LOWER CALIFORNIA.

ALAMO.—Cor. San Diego *Union*, Nov. 7: The El Paso Co.'s new 10-stamp mill is complete in every particular. They will begin crushing ore from the El Paso mine first. The ore is not selected, and their first run will be an average one. The International Co.'s mill has shut down for a few days to complete improvements at the mill, Ulysses and Princesa mines. It will start up this week. The houses over the Princesa and Ulysses hoisting works will be completed this week. The machinery at both mines is working admirably. The Princesa shaft is down 76 feet, and Ulysses 43 feet. Superintendent Sutherland is having the shafts on these mines sunk straight down (not following the veins). The Princesa vein was struck at 68 feet and left it at 73 feet. The ore taken out at this depth was remarkably rich. This shows that there is depth to the mines beyond all question. Superintendent Sutherland will drift on the Princesa from the 100-foot level. The Temecula mine continues to be the pride of the camp. They are working a shaft from the 50 foot level and drifting east from the same level. The International Co. put several men to work last week on smaller leads, the Cocenero, Indian and others. Superintendent Moore of the Torres Co. is expected home this week. It is rumored that he has purchased the interests of the other partners and on his return will be sole owner. He will have no difficulty in supplying his mill with ore. The Lane mill is amply supplied with custom ore. Your correspondent saw a cleanup from a small lot of ore to-day—3600 pounds—which weighed five ounces two pennyweights. The parties took the ore from one of Milton Santee's mines—the "Never Give Up"—on contract.

MONTANA.

PONY DISTRICT.—*Inter-Mountain*, Nov. 7: Harry Daley has just returned from the Pony mining district. At present there are a number of men searching in this district for work. It is about 23 miles in a northerly direction from Virginia City, Montana. Most of the prominent mines are owned by Helena parties, and they are conducted on a very saving basis. The Rose Bud is the most prominent mine in the district, but at present is giving employment to but six miners. There are many other prospects, but this is the only one of any consequence doing any work. The average assays of ore throughout the camp are about 30 ounces and about 25 per cent lead. The company has now in course of construction a 50-ton capacity concentrator, and a Ball steam stamp will also be added to the works. Many have to lie idle, paying nine dollars per week for board alone, with beds at a premium. The best mechanics command only four dollars per day and a majority three and a half, and there are a number who say that it is very necessary you come from Lake Superior mines to procure employment. The country is in a lime formation between two well-defined walls. The camp is 22 years old, but has only of late come prominently into the mining world.

MOOSE CREEK.—Dave Robinson, a former successful miner in this camp, has just returned from the Moose Creek district, and from him it is learned that the Sunset has made a shipment of ore taken from the 100-foot level to the Parrot smelter. The returns were very satisfactory to the owners, Messrs. Whitford and Sanders of this city, netting them 60 ounces per ton. The Moose Creek district is about 22 miles south of this city, and the country is completely laced with veins that go on an average of about 30 ounces per ton. It is too far to make shipments to Butte, and what is most needed is a custom mill to bring the country into prominence. Some prospecting is being conducted.

MINOR NOTES.—John Cabbage at Woodville has discovered a very promising lead. The ore is being removed to the mill for reduction as fast as taken out. The shipment of ore from the Antelope mine near Anaconda netted C. F. Brant, the owner, $109 per ton. The Glengarry has started up again in the old workings. More miners are at work in the Alice than for many months past. Ten additional men were put on Sunday morning. A large number of miners are daily seeking employment at the different mines of the camp, showing that the demand is fully supplied. It is rumored that some of the mines of the Oro Fino district have had to close down, pending the settlement of the dispute in regard to mineral lands, where the Northern Pacific is a party.

NEW MEXICO.

DEVELOPMENT WORK.—Silver City *Enterprise*, Nov. 8: The Bennett shipped 11 cars of ore in the month of October. The shipment this month will be much larger. Ed Dickenson has a force of 22 men on the Union in Hanover district; also two mines in the same district, owned by the Rio Grande Smelting Co. James Carr from Black Hawk states that the camp is looking up, and reports having struck horn silver in paying quantities. A strike has been made on the Signal mine, located near the Ruby, Gold Hill district. The ore runs 72 ounces in silver, as shown by assays made by Mathews & Black. The machinery formerly used in the Peerless mine was this week, by arrangements of the owners, to clear the indebtedness of the mine, sold to W. H. Newcomb, and is being transferred to Pinos Altos, where it will be used. The latter part of the present month work will be resumed on the Jewel mine, Cow Springs district. A big body of gold ore has been discovered. Work on the Colchies mill is progressing rapidly. Julius Wellghausen and Thomas Henry of Central City were in town Monday. During the past month Mr. Wellghausen has sunk a shaft 60 feet and drifted 12 on the Cuero de Sibolo, an old mine on which the Spaniards many years ago did an immense amount of work. There are huge dumps on the mine, larger than houses, while the excavations now partially caved in indicate many years of patient toil.

UTAH

CRESCENT.—Park *Record*, Nov. 9: The Crescent seems to be doing somewhat better under the new management. As fast as possible the ore reserves in the lower levels are being opened up, but the water is not very easily managed. The tramway has been kept running all along, as has also the concentrator. This week a shipment of first-class ore was made.

THE NEVADA-NORTHLAND.—Everybody was congratulating the owners and leasers of the Nevada-Northland property this week on hearing that they had cut ore in the shaft which is down about 275 feet. The leasers broke into some ledge matter the early part of the week, but expectations were not quite realized.

THE HIMALAYA.—No little amount of development work has been done on the property this season, and the results are considered very encouraging for a big mine under Scott Hill at no distant day. A four-foot ledge of fair-grade ore is exposed in one of the drifts from the shaft.

THE WHITEHEAD GROUP.—A representative of the *Record* saw some ore Thursday from the Whitehead group which assays upward of 20 ounces silver to the ton. It was good-looking rock and came from a drift run from the bottom of the shaft which is about 150 feet under the grass roots.

THE COMSTOCK.—Less than 30 feet remain to be driven through before making connection with the tunnel level from the old shaft at the Comstock.

CAMP CROSSCUTS.—The rough condition of the roads has interfered somewhat with ore-hauling the past week. The leasers of the Wasatch are fast getting their property in shape for production of ore. J. S. M. Jackson has been doing considerable development work on a limited scale the past season in Blue Ledge district. His group of claims, consisting of the Silver Kay, Boulder King, Blue Jay and Champion, which lie about a mile south of the Glencoe, is expected to come into prominence in due time.

ORE AND BULLION SHIPMENTS.—During the week the Crescent shipped 140,100 pounds of first-class ore and 60,000 pounds of concentrates. For the week just ended the Mackintosh sampler received and forwarded 265,960 pounds of Ontario ore, 139,000 of Daly; 78,610 of Mayflower No. 7 leasers; 60,330 of Alliance ore, and 215,480 pounds of Woodside concentrates from the Union concentrator; total, 759,380 pounds. The Ontario is making up its regular bullion shipment to-day.

SHUT-DOWN AT STOCKTON.—Salt Lake *Tribune*, Nov. 8: A report comes from Stockton that the Calumet & Muscatine Co. has drawn off all their force except eight men, who will continue work during the winter. In making this reduction the single men were discharged, leaving only married men to do the work.

MECHANICAL PROGRESS.

Mechanical Observations Abroad.

In the numerous reports on manufacturing enterprises in Europe made by the more intelligent and observing members of the mechanical delegation which recently visited the Paris Exposition, we find many items of practical interest. The general result of the observations made upon this trip should settle beyond a doubt the question as to whether the United States or Europe possesses the greater all-round advantages for success in mechanical operations. The 50 men who made up that delegation represented as many trades and specialties, and they declare unanimously that there is no country like our own for the mechanic. Their evidence tends to show that our mechanics have better food, better clothes, better homes, better wages and greater opportunities for advancement than any other nation. Also that a greater number of our mechanics own homes and other real estate and have more money deposited in savings banks to provide for rainy days. We find the following brief summary of some of the reports in one of our contemporaries credited to "The Press":

The pilgrims say they were allowed free access to the factories in England and France. In Germany they were not so fortunate, and when they got to the Krupp gun works at Essen they were positively refused admittance. They were welcomed at the Woolwich arsenal, and were shown how the big guns were made. In Paris, the municipiality, through the labor board, gave them the freedom of the city.

In only one industry—that of the manufacture of military paraphernalia—do they find that English-made goods are superior to American. In many cases our goods are more tasty and better made than theirs. Particularly do we lead them in machinery. Their machines, as a rule, are cumbersome and lack ingenuity and speed.

Cheney, the miller of the party, says that by long odds the best mill machinery he saw at the Paris Exposition was that which he helped to pack before he left home. Anderson, the tinner, in one factory in England saw the process of making tin buoys. They had to be put through the nine processes, while in America they go through only three, and the American product is better than the English.

Hanna, the iron and steel worker, when asked what he thought of the iron and steel-working machinery in the big works in England and Scotland, said: "It is all out of date, and in the mill I work in, in Cleveland, we would break it up for scrap. I saw nothing in my line that we could not beat. As for the condition of the working-men, there is no comparison."

Hugh Cavanagh, the shoemaker, says that in his line the men only do about 65 per cent as much work in England and France as they do here. There seems to be a marked indisposition to use improved machinery. What they have is very crude. "They work shorter hours than we do," he said, "only 54 a week, and have more holidays. It costs more to turn out a good shoe either in England or France than it does here. In England the shoemakers are well organized, but in France they are not. Rents in England are fully one-half less than we pay. In France there is not even the progress in the use of machinery that there is in England. I was talking to a large manufacturer in France and asking him why he did not use improved machinery, he said, 'Why, I employ 1200 men, and if I used much machinery I should have to discharge many of them. I am making a good profit and they are satisfied. What more do you want?' This knocked me out completely. The shoe machinery on exhibition at the Exposition is all of American make or design. I noticed that with the exception of a few factories in Paris neither the French nor English manufacturers go in for style so much as they do for usefulness."

Edmund Vail, the blacksmith, finds his trade in England well organized and prosperous. The English are the best off. Then come the French, with the Germans behind. In Holland, the shops are generally in the dwelling-houses and the smith's wife acts as the helper. In none of the European countries are the blacksmiths as well off as they are here.

W. T. Lewis, the coal miner, found his craft pretty well organized and making better wages than for 20 years past. The wages are low as compared with those paid to miners here, but this is in a measure compensated for by the fact that work is more regular. Joseph Thorpe, locomotive engineer, found his trade totally unorganized. Many engineers told him that the only reason that they did not come to America is because they could not save money enough to pay their fare. Wages are 50 per cent lower than they are here. The open cabs are still used; and the companies have recently taken the engineers' seats away from them, they say, to prevent them from going to sleep. Wm. Delaney, the bricklayer, finds that an American bricklayer does double the work that a French or English one can, but wages here are just about twice as much.

Mrs. Lenora M. Barry said: "The condition of female wage-workers in all the countries we visited is deplorable. In every branch of industry, except perhaps in clerical work, they are infinitely worse off than American women workers. Their pay is much less for the same work, and to live in the same style that our women do, would cost more. In the black district, in Devonshire, I saw women working at the forges making nails and chains. Among sewing women there is not much to choose. We have the same sweating system and the same starvation wages. Women there make shirts all by hand, at ninepence each. For machine-made shirts they get three shillings sixpence a dozen."—*The Press.*

The Value of Mechanical Literature.

The value to the mechanic of good periodicals and papers pertaining to the business in which he is engaged is often underrated by him, and he is apt to consider that he is none the worse for a lack of knowledge about the experience, opinions and work of others. This, says the *Master Mechanic*, is a most serious mistake on his part, and one which in the end will be suicidal to his best interests. One great reason why so much progress has been made in recent years lies in the fact that the ease with which men can give the results of their labors and experience to their contemporaries or leave them to posterity has resulted in a much greater diffusion of knowledge.

In the mechanical field this circulation of knowledge has enlarged and is still enlarging the circle of men who are well posted and fully alive to all that is going on. How then can a man neglect those very means of advancement by which others are progressing? It matters not whether he be a fireman, engineer, machinist, foreman, master mechanic or superintendent of motive-power, or whether his natural abilities be great or small, if he wishes to advance with the rest of the world he must know what it is doing, and this knowledge must be derived from the pages of papers devoted to mechanical affairs.

We recently heard a gentleman connected with one of the most progressive roads in the country say: "I am personally acquainted with a good many engineers on our road, but I must confess that I don't know a single one who takes any mechanical paper regularly." We know that such an assertion would be too sweeping for general application, but there is no road on which a very large percentage of the engineers are readers of papers pertaining to their business. Nor is this state of affairs confined to the trainmen, for we know of master mechanics who "never have time to read the papers." In some cases, however, they do the next best thing; they turn the papers over to the "boys." We think we could suggest a still better method of procedure, namely, to read them first and then turn them over to others. There are many young men who would be glad to get such reading, but who may not be able to pay for it, and there are others without any desire for it who would wake up to a realization of the possibilities in life before them if their views were enlarged. For these reasons a man is to be highly commended for putting into the hands of those in his employ good engineering and mechanical journals, but he is not true to his own interests if he himself neglects to read them.

SOME PECULIARITIES OF IRON.—Scientists are constantly developing new and interesting peculiarities of iron, many of which are being turned to useful account by practical mechanics. One of the latest developments in this direction is found in some French experiments, which show that if a bar of hard iron be allowed to cool from a white heat to a dull redness there is a spontaneous disengagement of heat, and its magnet properties suddenly change. In order to ascertain whether this result might be due to the heat set free by the modification of the iron, or if it required the presence of iron, iron was operated with containing from 0.16 to 1 25 per cent of carbon, by which means the first phenomenon above mentioned was found to be due to the molecular transformation of the iron, and the second corresponded to a change in the relation of the iron with its carbon. It takes place at 675 deg. C., when the thermometer suddenly stops and rises some 6 deg., afterward resuming its regular fall, as the metal cools. This was observed with steel containing 0.57 per cent of carbon, while with only 0 16 per cent of carbon a much slighter effect of the kind was noticed at about 749 deg.; with 1 25 per cent of carbon, the two effects appear to confound themselves. When the proportion of carbon is increased, the temperature of the transformation of the iron seems to be lowered, and that of recalescence raised, so that both come to coincide in the hard steel.

ELECTRIC WELDING NOT A NEW IDEA.—It was stated at the recent meeting of the British Iron and Steel Institute that the process of electric welding was successfully used in connecting one of the Atlantic ocean cables 12 years ago. It seems difficult to discover anything that has not at some time been known to mankind. The system of electric welding, however, has just been revived in a manner that will give it an importance that it never before possessed, and this is one of the characteristics of American enterprise, that it readily adapts old systems to the wants of this later age, and on a scale which few nations attempt.

PRESSURE VS. HAMMERING.—A new process in steel manufacture will shortly be tried at the works of the Barrow (Eng.) Hematite Steel Company. Instead of cogging or hammering the ingots into the form of slabs, the operation will be performed by the hydraulic press that has already been erected.

SCIENTIFIC PROGRESS.

The Comparative Insensibility of Animals to Pain.

The careful observer of nature must often be struck by the apparently enormous amount of pain and suffering inflicted on the lower animals by each other and by man. The bird tears to pieces the worm, the fly, or the snail, and is itself torn to pieces by the hawk, the cat or the weasel, while these in turn fall victims to the gun or trap of the sportsman. So it is with insects, and so with fish. There is very strong reason for believing that the lower animals are far less sensitive to pain than is supposed. It would seem that a large section of the public believe that the worm and the slug, the fly and the beetle, are quite as sensitive to pain as man; indeed, an article appeared in the *Spectator* a few weeks ago on the "Pitilessness of Angling," in which the writer affirmed that he could not see how the aphorism that the lowliest insect "feels a pang as great as when a giant dies" could ever be disproved. The suggestion that animals are less sensitive to pain than man is generally regarded as a weak apology for cruelty, but when we remember how little able, in comparison with man, they are to defend themselves from their numerous foes, and how many countless myriads daily meet with a violent death, such a suggestion should surely be hailed with pleasure and every piece of evidence in its favor carefully weighed. Our investigations have taught us that the source of pain is the brain, and that if the connection of any part of the body be cut off from the brain, that part becomes destitute of feeling. It occasionally happens that one of the main nerves to the hand or foot is cut through by accident, in which case the portion of the hand or foot supplied by the nerve immediately loses all feeling. Or, again, it happens that in severe accidents the spinal cord becomes so badly crushed as to prevent all impressions below the seat of the injury being conducted to the brain, and as a result the parts of the body supplied by nerves coming off from the spinal cord below the injury at once become insensitive. Now, as the general type of the nervous system is the same in all the vertebrate animals, and as we can prove that many of the functions of the brain in the lower animals are similar to our own, we have every reason to believe that the brain is the source of pain in their case just as it is with us. It is further certain that the sensation of pain originates in one definite part of the brain, and no amount of stimulation of other parts can give rise to it. Many painless operations are recorded in the pre-chloroform days for severe fractures of the skull attended by protrusion of brain tissue, and necessitating the removal of such tissue at the hands of the surgeon. And, again, it is a common experience to find tumors and abscesses developing in certain parts of the brain with an entire absence of pain, while in other parts the growth of such tumors gives rise to a good deal of suffering.

It would appear that as far as man is concerned, the more highly developed, the more active, the more wide-awake the brain is, the more sensitive does it become; and if this be true of man, why not of the lower animals also? Although the general type of the nervous system is the same in all the vertebrate animals, it is well to remember that in all the lower animals the brain is, in proportion to the rest of the body, very much smaller than in the case of man. It appears, too, that those animals whose brains are most developed and most exercised by their constant intercourse with man, as the dog and the horse, are more sensitive to pain than wilder and less domesticated animals. In dealing with animals it is necessary to consider carefully what signs may be depended upon as proofs of their suffering. Certainly their struggles and cries are not always true indications. All wild animals struggle under restraint. With many, cries indicate fear rather than pain. A hare when shot rarely cries; when closely pursued by dogs it often does. Animals when trapped rarely cry until some one approaches the trap. Frogs will cry out loudly on the appearance of anything at all resembling a snake; when injured with stones or cut by the scythe in mowing they rarely do so. Every gamekeeper knows that it is a common thing for a rat or a rabbit, when caught by the leg in one of the ordinary steel traps, to gnaw off its limb and so escape, while other animals when kept short of food, will readily eat their own tails. Another proof that animals are less sensitive to pain than man is their comparative freedom from shock after severe injuries. When a man meets with a very severe injury of any kind, a train of symptoms follow, which are collectively known by the name of shock. A striking pallor takes the place of the natural color, the skin becomes covered with a clammy moisture, the eye loses its natural luster, and the extremities become deadly cold, and while the ear may detect the fluttering action of the heart, the pulse at the wrist is often quite imperceptible. All these symptoms point to a great disturbance of the nervous system, whereas the lower animals often sustain the severest injuries without exhibiting any of the symptoms of shock. In man and animals the skin is certainly the most sensitive tissue of the body; we can hardly imagine that the scales which cover the bodies of fishes are equally sensitive. When we pass to the invertebrate kingdom, represented by shell-fish, snails, worms, insects, etc., we find an entire absence of brain, the nervous system being represented by two nervous cords running the whole length of the ventral surface of the body, and having a pair of small masses of nervous tissue, known as ganglia, developed at intervals. The extraordinary mutilations these creatures will successfully endure prove that their nervous system is but little influenced by shock, and render it almost certain that it is equally insensitive to pain. When we remember that the worm when cut in half does not necessarily die, but has the power of reproducing the lower portion of its body, and that in some orders the lower half develops a new mouth and becomes a new animal; again, when we remember that other members of the same sub-kingdom, such as lobsters and crabs, will frequently, when frightened, throw off a limb or two, we must conclude that their sense of pain is very small, and yet they are repeatedly spoken and written of as though they were as sensitive as man.—*Dr. W. Crollier in Nineteenth Century.*

THE DISCOVERY OF OXYGEN.—"Fixed air" and "combustible air" had been speculated upon, and "the air that is left after combustion" had attracted attention. But the phenomena of this kind, inconsistent as they were with the phlogistic theory, had not been sufficient to overthrow it. The first germ of Lavoisier's theory on these matters was embodied in a sealed packet which he deposited with the French Academy in 1770. Recognizing that the calcination of metals could not take place without the access of air, and that the freer the access the more rapid the calcination, he "began to suspect," as he expresses himself, that some elastic fluid contained in the air was susceptible, under many circumstances, of fixing itself and combining with metals, and that to the addition of that substance were due calcination and the increase in weight of metals converted into calxes. From this thought came, after much groping with erroneous conclusions, the idea that air is a compound containing a vital part and another part and that it is the vital part that is absorbed. The behavior of charcoal when burning in oxygen pointed to the nature of that substance and to the true theory of combustion. This new vital substance, which, uniting with metals, formed calxes, and with other substances generated acids, he called "oxygen" or the acid producer; the air that was left after combustion was *azote*, or lifeless. The inflammable air which, combining with oxygen, was found to form water, was called "hydrogen."—*Ex.*

THE ASTEROID recently discovered by Professor Peters has an orbit which is nearer to the sun than that of any like body now known. At first it seemed as if the orbit of the newly-discovered asteroid was within a portion of the orbit of Mars. But new computations may show that, like all the known minor planets, its path through the heavens is outside that of Mars. Our neighbor, Mars, moves around the sun in a track about equally remote from the earth and the zone of asteroids. Some of these tiny bodies, possibly the one recently discovered, may be of very great importance to astronomy, as affording better means for determining the earth's distance from the sun than even Venus or Mars.

HEAT.—Every one is familiar with the sensation of heat, at least. Heat is supposed to consist of the motion or vibration of the molecules of a body, and is produced by chemical action by the combination of certain chemical elements; by the mechanical work of friction or percussion and by the passage of an electric current. When a body is heated, the heat may increase the agitation of its molecules, raising the temperature of the body, or it may expand it against external resistance, thus doing external work, or it may overcome the attraction one molecule has for the other and change its condition. In this case the heat does internal work, and it can do all of these things at the same time.

ANIMALS BECOMING EXTINCT.—Fifty years ago the United States was the home of a large number of peculiar wild animals. Unless a National Preserve comes to the rescue very soon, another decade will see them nearly all extinct. The grizzlies are disappearing from the Rockies. A live buffalo is now worth from $500 to $1000, which three years ago cost scarcely one-fifth that amount, and they are found almost nowhere but in a corner of Texas and in the Yellowstone Park. The caribou has been hunted almost out of existence. The mountain sheep, the moose, the beaver and the antelope are all disappearing.

AN IMPORTANT DISCOVERY.—What purports to be an important discovery has just been made near Duddo, New South Wales, of a mineral which has by analysis been proved to contain all the properties of the very finest sienna, and which experts who have tested it in every way have found to be suitable for painting, staining, dyeing and for ink purposes. It is estimated that on the surface alone 20,000 tons of mineral was in sight; as a shaft has been sunk to 30 feet and the mineral improves in quality at that depth, there is evidently an inexhaustible paint mine.

WHAT IS A WEED?—A plant whose virtues have not yet been discovered.

GOOD HEALTH.

Remedy for Diphtheria

As diphtheria is becoming somewhat prevalent in California, the following would seem to be a timely piece of information. The article was communicated to the *Iowa State Register* by the practitioner, Dr. W. A. Scott of Pleasantville, Iowa:

The years that pass only confirm me in the fact that this is as near a specific in diphtheria as medical skill can reach. It doesn't fail if used in time and as directed. I use it successfully to this day. The recipe can be filled at any drug store, and used by any person without danger:

Take ten grains of permanganate of potassium and mix with one ounce of cold water. As soon as dissolved, it must be applied with a rag or sponge mop or swab to the whitish places in the tonsils, and other parts that have the diphtheria membrane on them. Do this very gently, but thoroughly, every three hours until better; then every six hours until well. It does not give pain, but is rather nauseous to the taste.

If the tongue is coated white, mix one dram of hyposulphite of soda and five drops of oil sassafras in four ounces of syrup made of sugar and hot water, and give a teaspoonful every one to three hours, as needed, when awake.

If the tongue is not coated white, I mix 20 drops of tincture of phytolacca in four ounces of cold water and give a teaspoonful every one to three hours, as needed, when awake. (The phytolacca is the common poke root of the South, and as it loses its strength by drying and age, the tincture should be from the fresh root, or it is worthless.)

It is well to apply a little sweet oil or cosmoline to the outside of the throat to protect from the action of the air, as the patient must be protected from all danger of getting chilled.

In the beginning of the disease in mild cases, the above solution of permanganate of potassium is all I use, and all that is needed, as the disease is local at first, but rapidly affects the whole system when seated. In the stinking form of diphtheria this solution soon destroys all smell, and in every case destroys the diphtheria membrane without leaving any bad effect behind.

Treatment of Wounds.

A few years ago it was the custom in the treatment of wounds to remove every day the dressing on the same and bathe the affected parts in castile soap and water. Cleanliness in that way secured was then considered an absolute essential to a cure. The consequence was, all wounds in those times were more or less inflamed, pus formed, and often weeks passed before a simple cut healed, and unsightly scars were common relics. But all that is now changed. It is the effort of the surgeon in any recent wound to shut out the air from the same, the fact having been recognized that there is something in the air which induces inflammation and suppuration. The something in question is recognized as microbes. For a time it was believed that they alone were capable of producing suppuration, but that theory was disputed, and evidence has been brought forward to show that it can be induced by certain chemicals. But that point can be of little interest to the layman, who needs simply to understand the general principles of wound treatment. If he of the average sort has an injured hand dressed by a surgeon to-day, he is quite sure, unless plainly forbidden to do so, to remove the bandages to-morrow and wash the wound—one of the worst things he can do. Under the old-fashioned treatment a simple cut scarcely ever healed inside of two or three weeks, but now if rightly treated it is likely to be perfectly well in a week or ten days. In fact it is surprising how quick it heals. So if a surgeon says to a patient, "Let the dressing alone and come to me in a week," he need feel no uneasiness; the apparent indifference and neglect is simply evidence that the operator understands his business and is up with the times. In the dressings now used by physicians there is incorporated some disinfecting agent, which when rightly applied, precludes all possibility of the troublesome microbes reaching the wound.

How Drunkards are Treated in Norway.—The London correspondent of the *American Practitioner and News* says that a well-known medical man who has recently been in Norway gives a glowing description of their manner of treating dipsomaniacs. An habitual drunkard in Sweden and Norway is treated as a criminal in this sense, that his inordinate love of strong drink renders him liable to imprisonment, and while in confinement it appears he is cured of his bad propensities on a plan which, though simple enough, is said to produce marvelous effects. From the day the confirmed drunkard is incarcerated, no nourishment is served to him or her but bread and wine. The bread, however, it should be said, cannot be eaten apart from the wine, but is steeped in a bowl of it and left to soak thus an hour or more before the meal is served to the delinquent. The first day, the habitual toper takes his food in this shape without the slightest repugnance; the second day he finds it less agreeable to his palate, and very quickly he evinces a positive aversion to it. Generally, the doctor states, eight or ten days of this regimen is more than sufficient to make a man loathe the very sight of wine, and even refuse the prison dish set before him. This manner of curing drunken habits is said to succeed almost without exception, and men or women who have undergone the treatment not only rarely return to their evil ways, but from sheer disgust they frequently become total abstainers afterward.

Leprosy.—The following description of how this terrible disease develops and affects the patient is taken from the Hankow (China) Medical Mission report: Leprosy is common. It chiefly affects men who work in the field; we have met with it in brothers; it is occasionally met with in women. The age varies from 10 to 50 years. Often the first symptom complained of is some localized anæsthesia—which is sometimes quite accidentally discovered—in the feet, hands or face, which are the parts that are most commonly affected. The sensory nerves are first affected and sensation as a rule absent partially or completely. The anæsthesia is followed by want of free use of affected parts; the circulation is also impaired in those parts; the hair on the eyebrows falls out. A peculiar punched-out looking ulcer with a very fetid discharge is often met in the feet, sometimes, but not so often, in the hands. As the disease advances, which it does very slowly—it often apparently remains stationary for years—the face broadens, becomes square, glazed, irregular and nodular; nodules are also found in the mucous membrane of the lips and in the nerves; perspiration is absent; the natural expression of the face is completely changed; the patient looks old and sad. As the disease further advances the toes and fingers drop off, and by and by part of the limb. The general health is never affected. Treatment is not very satisfactory; symptoms appear to be controlled for a time, but never cured.

Baldness and Dandruff.—The Cincinnati *Lancet-Clinic* says that a solution of chloral hydrate, five grains to the ounce of water, will clear the hair of dandruff and prevent it falling out from that cause. In many instances, where the patient is nearly bald, the application of the above-mentioned solution will restore the hair. Arnica oil is also an admirable remedy to promote the growth of hair. A small quantity, well rubbed into the scalp three or four times a week, can be tried with expectations of benefit.

Causes of Typhoid Fever.—Dr. Elson sums up the causes of typhoid fever in the following words: First, typhoid fever never infects the atmosphere; second, it never arises *de novo;* and third, the causes of the disease, in order of their frequency, are as follows: First, infected water; second, infected milk; third, infected ice; fourth, digital infections; fifth, infected meat.

USEFUL INFORMATION.

To Restore the Freshness of Worn Clothing.—The mystery to many people how the scourers of old clothes can make them almost as good as new is explained in the *American Analyst* as follows: Take, for instance, a shiny old coat, vest, or pair of pants of broadcloth, cassimere or disgonal. The scourer makes a strong, warm soapsuds and plunges the garment into it, souses it up and down, rubs the dirty places, if necessary puts it through a second suds, then rinses it through several waters, and hangs it to dry on the line. When nearly dry, he takes it in, rolls it up for an hour or two, and then presses it. An old cotton cloth is laid on the outside of the coat and the iron passed over that until the wrinkles are out, but the iron is removed before the steam ceases to rise from the goods, else they would be shiny. Wrinkles that are obstinate are removed by laying a wet cloth over them and passing the iron over that. If any shiny places are seen, they are treated as the wrinkles are; the iron is lifted, while the full cloud of steam rises and brings the nap up with it. Cloth should always have a suds made specially for it, as if that which has been used for white cotton or woolen clothes, lint will be left in the water and cling to the cloth. In this manner we have known the same coat and pantaloons to be renewed time and again, and have all the look and feel of new garments. Good broadcloth and its fellow cloths will bear many washings, and look better every time because of them.

Tinware.—The majority of our readers are well aware that the tin of common use is not real tin, but only sheet iron or steel, with an infinitesimal covering of tin on the surface. It is this fact that, in a measure, says a cotemporary, works to the disadvantage of reputable manufacturers. In a box of good tinplate which weighs 112 pounds there are only about five pounds of tin, so you can see how delicate the film is. Yet tinplate is imported constantly that weighs but 90 pounds to the box. Besides, there is a difference in the quality of the filling, or black sheets, as we call them. Coke-finished iron sheets are much inferior to charcoal finished, and these, in turn, to Bessemer's steel. Hence there is a wide field for inferior manufacture, and the market is glutted with goods that retail at a lower price than serviceable articles could possibly be manufactured for. When the public can get neat-looking stamped ware made of inferior plates at a mere song, the better staple of goods is run out of the market. The cost of manufacturing poor stamped ware is approximately the same as it is for the best. The difference in the retail price of the two lies in the stock. Poor plate tin requires more intermediate steps before the manufactured article is finished, since the brittleness of the filling will not bear much of a strain without being seamed and cracked.

Imparting to Wood the Characteristics of Metal.—The recent process by which wood is made to take on some of the characteristics of metal, says an exchange, has been turned to practical account. By this process the surface becomes so hard and smooth as to be susceptible of a high polish, and may be treated with a burnisher of either glass or porcelain, the appearance of the wood being then in every respect that of polished metal, having, in fact, the semblance of a polished mirror, but with this peculiar and advantageous difference—namely, that unlike metal, it is unaffected by moisture. To reach this result the wood is steeped in a bath of caustic alkali for two or three days together, according to its degree of permeability, at a temperature of between 165 and 197° F. It is then placed in a second bath of hydrosulphate of calcium, to which a concentrated solution of sulphur is added after some 24 or 36 hours. The third bath is one of acetate of lead, at a temperature of from 95° to 120° F., and in this latter the wood is allowed to remain from 30 to 50 hours. After being subjected to a thorough drying, it is in a condition for being polished with lead, tin, or zinc, as may be desired, finishing the process with a burnisher, when the wood apparently becomes a piece of shining, polished metal.

How to Tell Good Oats.—Good oats are clean, hard, dry, sweet, heavy, plump, full of flour, and rattle like shot. They have a clean and almost metallic luster. Each oat in a well-grown sample is nearly of the same size. There are but few small or imperfect grains. The hard pressure of the nail on an oat should leave little or no mark. The kernel when pressed between the teeth should clip rather than tear. The skin should be thin. The size of the kernel will be less in proportion than the skin is thick. The color of the oat is not very material, but white oats are generally thinner in the skin than black. Again, black oats will grow on inferior soils. Short plump oats are preferable to large, long grains. Bearded oats must have an excess of husk. Oats are not necessarily bad because they are thin skinned or bearded; but they must contain a less amount of flour per bushel than thin-skinned oats without beards.

A Red-Boiled Egg.—It is something unusual to find the white of a fresh, hard-boiled chicken egg of a red color, after taking off the shell. But a German chemist writes to the *Weekblad Drug Bulletin* that he has met with such an occurrence which he attributes to the presence of micro-organism. He writes as follows: "I presumed that I had to do with a micro-organism; tried to cultivate it, and was not disappointed. A potato substrate was in a short time covered with an intense growth of bacillus prodigiosus. We have here a bacillus that not only withstood being boiled for a certain time, without impairing in the least its vitality, but one *inside* of fresh eggs."

The Weight of the Whale.—Nillson remarks that the weight of the great Greenland or right whale is 100 tons, or 220,000 pounds, equal to that of 88 elephants or 440 bears. The whalebone in such a whale may be taken at 3360 pounds and the oil at from 140 to 180 tons. The remains of the fossil whale which have been found on the coast of Ystad, in the Baltic, and even far inland in Wangapanse, Westergothland, betokens a whale which, although not more than between 50 and 60 feet in length, must at least have had a body twenty-seven times larger and heavier than that of the common or right whale.—*Scientific American.*

An Ancient Strike.—Strikes among workmen are not altogether a modern idea. The antiquity of strikes is attested by an incident in the history of mediæval Strasburg, in Alsace. In 1409 the millers of Hagenowe (suburb of Strasburg) banded themselves together to get better terms from the bakers. All the millers took an oath by which they bound themselves not to grind without the leave of the union. He who transgressed was to be sent to Coventry—that is to say, with him no miller was to work, eat or drink. The journeymen were included in the union.

The First Telegraph Office was opened in Washington in 1845, and the receipts from April 1st to 4th, inclusive, were one cent. On April 5th the receipts rose to 12½ cents and on the 6th and 7th fell off to nothing. April 8th the office took in $1.32, and on April 9th, $1 04.

The Two Expositions.—Very few people are aware how many more people have visited the Paris Exposition than were admitted to the Centennial at Philadelphia in 1876. This had 9,875,625 visitors, and the Paris Exposition is in a fair way to have 35,000,000.

ENGINEERING NOTES.

Canal Works for Electrical Conduction.—If the project relating to a new canal at Rheinfelden, Germany, be carried out, an enormous stimulus will be given to electrical engineering, since the power rendered available through the construction of this canal will amount to not less than 11,000 horse-power, and will have to be transmitted electrically to Basel, Sackingen and other places. The project has been worked out, and the undertaking is promoted by three of the best Swiss engineering firms. The plans are ready, the capital is available, but the concession has not yet been obtained. Work is to begin in the present autumn, and the whole undertaking will be completed in 1891. The length of the canal is 1½ miles, its width is 165 feet, and there will be erected a turbine house containing 23 turbines, each of 750 horse-power. Each turbine will drive its own generator. The pressure adopted will be sufficiently high to enable the distribution of power to be effected economically within a distance of 15 miles. The power of the turbines being 17,000 horse-power, a total of 11,000 horse-power will be available to the consumers.—*Engineering and Mining Journal.*

The Jet Propulsion of Boats.—Another attempt at jet propulsion is to be made—a 100-foot boat, named the Evolution, has been built for the experiment. The Chicago *Journal of Commerce* pretty effectually takes the life out of the project in the following manner: The jet in this case is to be only three-fourths inch in diameter, but is intended to issue at a pressure of 2500 pounds to the square inch. It is a pity that sanguine inventors, like the originator of the above scheme, are so frequently ignorant of elementary mechanics, as a simple calculation must show that even if all losses from friction were eliminated, and he succeeded in driving his boat at 19 knots, nine-tenths of his power would still be totally wasted; and, similarly, to get an efficiency of one-half, his boat must travel at the rate of 120 knots. On the other hand, to maintain a pressure of 2500 pounds to the square inch in the jet would require about 1500 indicated horse-power, a large amount for a boat of the size; still the inventor has apparently succeeded in getting capitalists to back him.

Not Discouraged.—Quite undaunted by the failure of the Panama Canal, and possibly stimulated by the progress of the Manchester Ship Canal, the French are seriously considering the question of a ship canal from the sea to Paris. There appears to be no question that the commerce of France is seriously suffering from the competition of Antwerp, whose trade has been steadily increasing, while French interests have lost proportionally. A commission appointed to examine the matter has presented a report of a decidedly favorable nature, and states that no serious difficulties present themselves in the way of the execution of the project. The estimated length of the canal is about 112 miles, and the maximum cost $40,000,000.

Theory and Practice.—Some one has tersely remarked that after all theory is but the aristocratic offspring of practice, and dependent upon its staid and commonplace progenitor for its reputation. Engineers who are confronted with the realities connected with a marine engine, realize what it is to see the burnished and glittering theory of a student lost beneath the shower of facts that ever present themselves at critical periods, such as is found when attempting to improvise some way to tide over a difficulty.

Government Acquisition of Canals.—The British Board of Trade are taking active steps to obtain from the various canal companies and trusts of the kingdom information as to the practicability of a scheme for the acquisition of the entire canal system of the country by the State. It is understood that leading men of all parties, in view of the railway rates difficulties, are in favor of the principle of the State acquirement of the canals.

Japanese Progress in Engineering.—*Indian Engineering* says: For the last eight or nine years the Japanese men-of-war have been commanded entirely by Japanese, but in the engineering department foreign aid has still been retained, but it is now expected the whole of the foreign engineers employed by the Naval Department will be dismissed early next year.

The Canal at Corinth, Greece, which will shortly be completed, was actually commenced more than 1700 years ago. When completed it will be four miles long, with a depth of 26½ feet. It was projected by the Romans during the reign of Nero. The original contractor has been dead for several years.

The Enterprise of Science is admirably illustrated in the fact that a party has gone from this country in a man-of-war to Africa, a distance of over ten thousand miles, to witness a four minutes' eclipse of the sun, and will at the same time run the risk of a cloudy day.

A Bee's Work.—Some ingenious arithmetician has calculated that it requires 3,650,000 visits from bees to 62,000 heads of flowers to collect one pound of honey.

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Passing Events.

The silver and lead conventions in the interests of those metals are sure to be beneficial to the mining industry, even if Congress does not do all that is hoped for. Silver is gradually rising in value, and it is pretty certain that Congress will stop the free admission of lead ores now going on under an ill-advised ruling of the Treasury Department.

It will be good news to the copper miners that this metal is again rising in price, and has nearly touched 13 cents. With increase in value of this product many mines now idle can start up with profit.

With certain changes recently made, the electric-motor plant of the Nevada mill is now working to the entire satisfaction of the management. This is the largest electric-motor plant in the world. The dynamos now furnish above 200-horse power of the total required to operate the mill.

An Advance in Metals.

When a few months ago the English Government gave out large contracts for iron and steel vessels of war, the iron market abroad was at its lowest. With these contracts, followed by more from other nations, together with contracts for large and more effective ordnance, the market began to gain strength. As prices crept up, contracts for building iron merchantmen and also steamers began to increase, which caused quite an upward movement in the English iron markets, that gained in importance even up to the present writing. With the improvement in the iron market, coal began to appreciate, and gradually other industries were drawn into line, until today our advices report general trade very active and higher legitimate (not speculative) prices paid for iron, tin, copper, steel and other metals than for several years past.

The advances appear to be for the present upon solid basis, which insures good prices, if not still higher, for some time to come, while the advance in metals is felt in all other industrial pursuits, but probably to none more so than the banking institutions in England. This is reflected in the following from a leading Eastern paper: "The general improvement of business in Great Britain is shown in the fact that without any increase in the paid-up capital of the London Joint Stock bank there has been an appreciation of over £7,000,000 in their market value in the last six months. Their total capital is a little less than £70,000,000. The market value of their stock is £204,200,000, an increase of a little more than three per cent in six months. Bank deposits have increased very largely, and naturally the amount of their discount and advances has also rapidly increased."

All the above has a direct bearing on the markets in this country, and are already stimulating them into greater activity.

Insulating Material.

THE Work of a California Electrician.

James B. Williams, M. D., a member of the American Institute of Electrical Engineers, and a former resident and practitioner of this city, has recently completed at Oakland an examination of all obtainable materials which are used for electric insulation, together with the best methods of preparing and using the same. This examination has probably been the most thorough ever made by a single individual in this country, and has had for its object the production, by practical experiments and tests, of compositions which would afford the most efficient insulation for electric wires and cables for outdoor, indoor and underground use.

The work was commenced in this city over three years ago, and finished in Oakland, in a factory provided with mixing, tubing, wrapping, taping, stranding and braiding machinery, and vulcanizing apparatus, all of the machinery being of new and improved design.

The materials examined include resins and gum resins; paraffins, solid and liquid; India rubber and gutta percha; bituminous matters; petroleum residua and their distillates; oils, vegetable and mineral; fibrous substances, such as cotton, jute, asbestos, parchment, etc., and various carbonates, oxides and silicates.

The above substances, after having been carefully purified and prepared for use, were taken singly and in combinations of two or more, amounting in all to about 500 combinations. They were used, hot and cold, vulcanized (when vulcanizable) and in solution in various solvents; and were examined and tested microscopically, chemically, and electrically, and the effects of moisture, time, heat and cold, gases, etc., upon them, when in thin sheets and on wires, carefully noted and recorded.

Insulated wires and cables, made by every manufacturer in this country, from the simple "bell wire" to the costly vulcanized wires, were also carefully examined and tested, the details of their manufacture noted, and their comparative values determined.

The efficient protection of wires and cables was also carefully studied; and various paints and varnishes, compositions applied hot and cold, and metallic substances were tried. A liquid preparation, which, when dry, is flexible and elastic, has been selected for application upon fiber and metal. This preparation will protect substances upon which it is applied against the action of commercial acids and alkali for a considerable period of time; and it is insoluble in almost every solvent used in the manufacture of paints and varnishes.

At the beginning of the investigation it was found that the testing instruments at present used to measure insulation resistance were not sufficiently delicate, and it was therefore necessary to design and make an instrument which would enable the comparative insulation resistance of any known substance or composition when placed on short lengths of wires which were charged to potentials of over 5000 volts—at which potentials all of the tests were made—to be rapidly determined.

This particular instrument—as well as the rest of the costly and elaborate electrical apparatus used by Dr. Williams during the past nine years—was designed and made by himself in his laboratory, and consists of a modification of Sir William Thompson's quadrant electrometers with an "induction plate." Its needle system is suspended by a long bifilar suspension, with means for adjusting the same, which allows the needle and its mirror a wide range of motion. The accessory apparatus consists of a replenisher and idiostatic gauge contained in a vessel with a Leyden jar; an improved discharge key, and supports for wires while being tested; an air-condenser; and a six-inch spark coil for charging the apparatus and wires to high potentials.

The insulation of the instrument is so perfect that its quadrants will remain charged at very high potentials for hours without any perceptible leakage taking place; and such is the delicacy of the instrument that the presence of fine dust or moisture on insulated wires two inches long, differences of their temperatures and variations of their capacities are immediately detected by the image of the crosshair moving along the scale. As far as is known, this is the only instrument of this kind in this country; and it is the only kind of testing instrument which can be used to enable the comparative insulation resistance of short lengths of wires charged to very high potentials to be rapidly determined. When a well-insulated battery is substituted for the coil, and the replenisher and gauge connected to the instrument, the latter can be used in the same manner, and for the same purposes, as a "White pattern" quadrant electrometer; and if the "Induction plate" be used with the coil instead of the quadrants, potentials of many thousands of volts may be used.

The result of the investigations thus briefly outlined has been the production of wires and cables which are insulated with compositions having an exceedingly high insulation resistance, which are durable, and which can be easily and cheaply manufactured by the improved machinery which has been designed for this purpose.

Particular attention has been devoted to the manufacture of underground cables during this investigation, and such cables have been made which, in addition to having an unusually high insulation resistance, have a very low capacity, which makes them particularly adapted for underground use.

Samples of some of the wires have been exposed for months—in one instance for three years—to dampness and marsh gas without cover or protection of any kind over the insulation, and yet no lowering of the insulation resistance or deterioration of the composition could be detected.

The insulation on all of the wires, except the weatherproof and some of the vulcanized indoor wires, is protected by a metallic layer, and this layer further protected by a braid which is saturated with the protecting composition before referred to. This method of protecting the insulation has been found to be very efficient, and when properly used the insulation will be preserved for an indefinite period of time.

A company having its headquarters in New York City will manufacture all kinds of electric wires and cables which are insulated and protected with compositions invented by Dr. Williams and manufactured with his improved machinery. They will be insulated with vulcanized and unvulcanized compositions, and there is every reason to believe that they will have a large sale as soon as placed upon the market.

Dr. Williams has been assisted throughout this investigation of materials used for electric insulation and the methods of manufacturing and using the same by his brother, R. W. Welty; and, in addition to this work, they have invented several useful devices and processes.

We may add that descriptions of various electrical apparatus invented and made by Dr. Williams during the past eight years have been published in this journal, and were afterward extensively copied by other scientific journals. His electro-medical apparatus — subsequently enlarged and improved—which was illustrated and described in this journal in March, 1881, was considered the first complete apparatus of its kind ever invented and made.

THE Supervisors of San Francisco have created the position of elevator inspector at a salary of $150 per month.

The Geological Survey.

The local branch of the United States Geological Survey which has been in this city, in charge of Prof. G. F. Becker, for some years, will be abolished, and on the first of the month the specimens and instruments will be shipped to Washington. The members of the survey here have been for the past three years engaged upon a geological survey and map of the California gold belt. This work is not yet complete and will be resumed next summer. It is the opinion of Major Powell, Chief of the survey, that he can do better by centralizing his forces, and will send field parties to California in summer, keeping them in Washington in winter.

This "centralization" is rather a fad with Washington officials, and they want all the work possible done there, spending large sums of money for transportation of parties back and forth in preference to keeping the active members where their work lies. From the nature of the case it is hardly practicable for Major Powell to make geological surveys of California without at least sending a few geologists to this State to do it, but if it were possible, doubtless he would like to keep them "under his immediate supervision."

Of course it is very well understood that this "personal supervision" is all nonsense. The chief knows nothing whatever of details, which are worked up by subordinates, and he must depend entirely on these assistants for the conclusions reached. Their names are incidentally mentioned, and he gets the glory.

The U. S. Geological Survey branch which has work to do in California ought to stay in California and do it. There is no good reason for its being removed to Washington and then sent out here periodically to make a show of field work, losing more or less time every season. The branches have been withdrawn from Colorado, California and other mining States, and the parties recalled to Washington, where there is no geology to study except that of the pavements. There are scarcely any men from the mining States or Territories employed on the U. S. Geological Survey, most of them coming from Washington or thereabouts, and possibly the director would rather have them spend their incomes where they belong instead of in the uncivilized regions of the "Wild West."

A Worked-Out Mine.

The Sierra Buttes mine, Sierra county, is called a worked-out mine because it is now only turning out about $8000 a month. It is among the oldest of California quartz mines, having been worked continuously for some 30 years or more. Prior to 1870, when it was acquired by the present company, it had produced $1,955,050. From 1870 to June, this year, the value of the gold produced was $6,369,425, and dividends paid during the same period amounted altogether to $1,574,665, or $15.16⅔ per share. The total production of gold from this mine has been $8,324,475.

This is a pretty good record for any one mine. Of late its force has been reduced, for its ore in the lowest levels has been poor for a year or more. Several hundred men were formerly employed. The company, however, owns a fine producing mine in Plumas county, and lately purchased another producing one in Shasta county. The owners are English capitalists. There is a fine 60-stamp mill with all modern appliances belonging to the Sierra Buttes mine, as well as an old mill up on the mountain side. The company also own valuable water rights in Sierra county. The Sierra Buttes is the deepest gold mine in the world. Its lowest workings are 3000 feet below the surface on a vertical line, and its lower, or No. 9, tunnel is about 9000 feet in length. The ledge is still of good size and well defined at the face of the lowest tunnel, but is of low grade. It is possible, however, that a "chimney" may be struck in some portion of the mine which will yet pay. But even if the mine is closed altogether, it has made a good record and a lot of money. The town of Sierra City was supported for years mainly by this mine. Now the Young America, producing $30,000 a month, is looked upon as the mainstay of that section.

NAME WANTED.—If the person who mailed us a postal note without any letter from Auburn, on the 7th inst., will send us his name, he will receive proper credit on our books.

Dumping-Cradles for Mine-Cars.

The accompanying figures illustrate the dumping device used at the new dressing works of the St. Joseph Lead Co. at Boone Terre, Mo. It is a dumping-cradle permitting the car to be turned upside down to discharge its load. The main advantage of this type of dumping apparatus is that it permits the use of cars of simple construction not weakened by hinged doors or bottoms.

The wheels of the mine-car run between the upper and lower arms of the curved rocker-irons *B* (Figs. 1 and 2), the lower arms forming a continuation of the track. The apparatus is so constructed that the axis *D* is below and back of the center of gravity of the loaded car, but above the center of gravity of the empty car. The dumping of the car and its return to a normal position are both automatic. A chain, not shown in the sketch, prevents the cradle from turning too far, and the catch permits the car to be held upside down till the load is completely emptied.

The body of the car is made of 3-16" boiler-plate, the sides and ends in four separate pieces, bent at the corners and riveted. The top edge is strengthened by a 3" piece of strap-iron ⅜" thick, riveted to side and ends. The bottom is attached to the sides by a piece of angle-iron riveted through flanges and placed inside the sides and ends and below the bottom-plate. The car-body is supported on two oak sills, 4"x8½" by 22" long. These raise the bottom of the car high enough to allow it to project over the wheels. This description was written by H. S. Munroe of New York, for the American Institute of Mining Engineers.

Mr. Edward F. Wiokes of the School of Mines, Columbia College, describes a dumping-cradle employed at the Chapin mine, Lake Superior. One disadvantage of dumping-cradles is that they are ordinarily fixtures and a separate cradle has to be erected at each dumping-place. This difficulty is overcome at the Chapin mine by the simple device of mounting the cradle on wheels. The iron ore cars are 6 feet 1 inch long, 3 feet 4 inches wide at the top, 2 feet 4 inches wide at the bottom and 2 feet 4 inches deep. The wheels of 8-inch radius, 3 feet gauge, are set 2 feet apart.

There are two 3-inch x 3-inch iron bumpers, 4 inches long, at each end of the car. The capacity of the car is two tons.

The endless wire-rope used for hauling the cars, moving about three-fourths of a mile per hour, is carried between the rails on grooved rollers.

The cars are attached to the rope by a clutch or grip (Fig. 5), which extends seven inches below the car-bottom. The rope is gripped between a piece bolted to the car and a lever held in position by an elbow-joint.

At 20 feet above the ground level a trestle about 120 feet long leads from the shaft-house to an ore-pocket. From about 25 feet in front of the shaft to directly over the ore-pocket extends the automatic dumping cradle, shown in Fig. 3, which is an end view, with the portion *a b* removed, and Fig. 4, which is a plan. The frame (8 feet 4 inches wide and 9 feet 8 inches long, made of 7½ inch x 2-inch channel beams with two four-inch I-beams of the same depth set across the frame 7 inches from each end) rests on four wheels of 8-inch radius, running on a track of 8 feet 11 inch gauge. The cradle proper consists of two iron rings 5 feet 4 inches outside diameter, 3 inches wide, and three-fourths inch thick, held apart by two angle-irons, so set that the horizontal distance between them shall be the width of the top of the car (See Fig. 3).

The track rails are carried on iron cross-pieces. The cradle, which is also strengthened by two iron rods diametrically opposite each other, rests between the I-beams, on four wheels of nine-inch radius, the axles of which are supported on bearings on the under side of the two end cross-beams. The distance between the centers of these wheels is such that the rails on the cradle correspond with the rails which project over and rest upon the frame when the cradle is in position to receive a car. The cradle is free to revolve on these wheels.

There is also a catch for the wheels of the car. Fastened to one end and revolving around the central axis of the frame, with the bearing shown in Fig. 4, is a square iron rod, which projects 18 inches beyond the side of the frame. On the end of this rod is a wheel five inches wide; and over the side channel bar is another wheel of the same size. The part of the rod between these two wheels is round. At a point on this rod opposite the end ring is a hinged piece which projects under a catch on the cradle-ring (see *D* and *E*, Figs. 6 and 7); the inner wheel is confined in an inverted U-shaped guide, fastened on the side channel and beam set inclined; a plank running lengthwise, on the other side of the frame, acts as a platform. An endless 5-inch wire rope, carried from each end of the frame over a system of pulleys to the engine-house, more than 750 feet away, moved the apparatus. The 12-inch x 36-inch Corliss engine, driven by compressed air, runs the truck at shaft *B* and the cradle at shaft *C*.

Fig. 2.

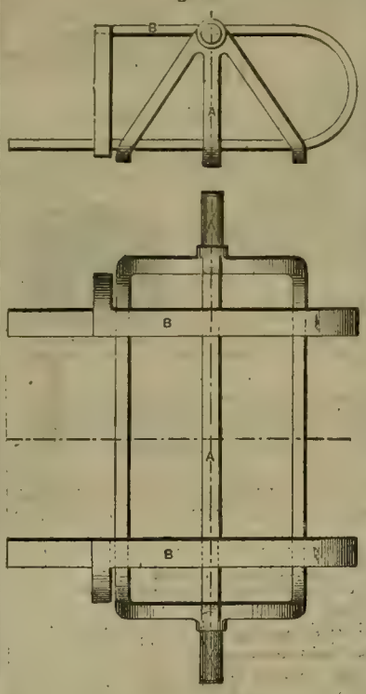
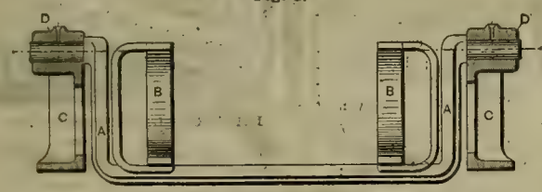
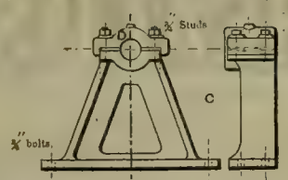
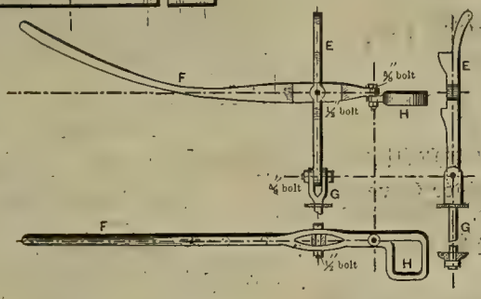


Fig. 1.



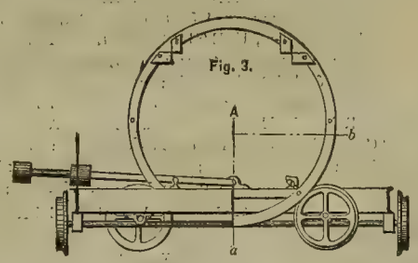


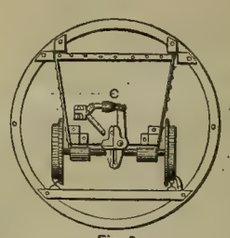


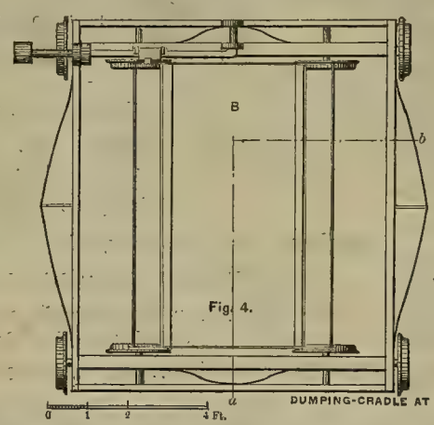
After the car is brought to the surface on the cage it is pushed off the cage and upon a truck 5 feet long, running at right angles to the track, and is then shifted to a track midway between the two cages. From this track it is pushed upon the cradle (the track projecting over and just clearing the cross-beams of the cradle-frame, and meeting the rails in the cradle). The cradle is now moved on its track until directly over the ore-pocket, at which point the wheel on the end of the rod projecting beyond the side of the cradle, strikes an incline *G*, Fig. 8 (the incline is not drawn to scale), which gives it a sudden upward movement and starts the cradle revolving. The center of gravity of the loaded car and cradle being above the axis of the cradle insures the completion of at least a half-revolution, which would dump the ore; but the momentum carries the cradle beyond this point. A workman, who always rides out on the platform of the frame, now rights the cradle, and it immediately returns to the shaft. The incline mentioned above is made of wood covered with a piece of inch half-round iron, which acts as a track.

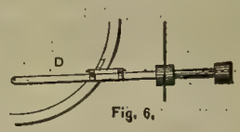
Hydraulic Mining.

On page 373 is given a view made direct from a photograph of a hydraulic mine in one of the northern counties of the State. It is a typical scene and one that until a few years ago was common in many counties of California. The prevention of hydraulic mining in those sections where the resultant debris passes into navigable rivers has closed most of the mines, but in portions of Siskiyou and Trinity counties this class of mining is still carried on, no injury being done to any one by the debris. There are still many thousands of acres of auriferous gravel unworked in California. The banks in some cases are hundreds of feet high. Large expenditures are made to bring in a water supply, and the water is often allowed to flow down over these banks, as shown in the engraving, gold being concentrated from the gravel by the heavy volumes of water.

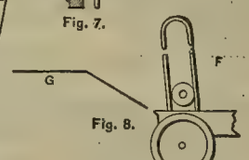












DUMPING-CRADLE AT THE CHAPIN MINE, LAKE SUPERIOR.

AUTOMATIC DUMPING-CRADLES FOR MINE CARS.

Bullion Production.

Report of the Director of the Mint.

Edward O. Leech, the Director of the Mint, has submitted to the Secretary of the Treasury a report on the operations of the mints and assay offices for the fiscal year ended June 30, 1889.

Deposits and Purchases of Gold and Silver.

The value of the gold deposited was $48,900,712.04, of which $31,440,778.93 consisted of the product of the mines of the United States, against $32,406,306 59 deposited during the prior fiscal year, indicating a falling off in the gold product of about a million dollars. Foreign gold coin and bullion were melted down of the value of $6,583,992.65.

The silver received aggregated 35,627,273 69 standard ounces of the coining value of $41,457,190.97. Of the silver received, 32,895,985 50 standard ounces of the coining value of $38,278,964.79 was classified as of domestic production. The silver purchased for the silver-dollar coinage during the year on offers to the Treasury Department aggregated 28,557,109.79 standard ounces, costing $23,998,763 47, an average cost of $0.9337 per ounce fine.

The average price of silver in London during the year was $0.9316 per ounce.

The total amount of silver acquired for the silver-dollar coinage, including small purchases and partings, aggregated 29,409,845.59 standard ounces, costing $24,717,853.81.

The profit on the coinage of silver dollars during the year was $9 370,062.20, and on subsidiary silver coins $32,987.65; total seigniorage, $9,403,049.85.

The total coinage of silver dollars under the "Bland" Act, to Nov. 1, 1889, was $343,638,001, and the total profit on the silver coinage to July 1, 1889, $57,378,254.18. The net profit (after deducting expenses for distribution and wastage) for the 11 years ended June 30, 1889, was $56,349,737.57. The number of silver dollars in circulation Nov. 1, 1889, was 60,098,480, and the amount held by the Treasury in excess of certificates outstanding was 6,219,577. The number of silver dollars distributed from the mints during the year was 14,141,319, an excess of 2,089 215 over the amount transferred in the preceding year. Forty-two million silver dollars were transferred from the Mint at Philadelphia and 8,000,000 from the Mint at New Orleans to the Treasury at Washington for storage during the fiscal year. The coinage executed at the mints was as follows:

COINAGE OF FISCAL YEAR 1889.

Denomination.	Pieces.	Value.
Gold	1,639,235	$25,543,910 00
Silver dollars	33,793 860	33,793,860 00
Subsidiary silver	6,477,134	721,686 40
Minor coins	51,516,861	906,473 21
Totals	93,427,140	$80,965,929 61

Gold and silver bars were manufactured as follows:

Gold	$22,241,121 42
Silver	6,709,246 13
Total	$28,950,367 55

Medals were manufactured at the Mint at Philadelphia as follows:

Gold	75
Silver	546
Bronze	188
Total	809

Gold bars were exchanged for gold coin, free of charge, principally at the assay office at

BOILER INSPECTION.—At the meeting of the Fire Committee of the Board of Supervisors this week, the order providing for the inspection of boilers was discussed. Ex-Supervisor Gibbs addressed the committee in opposition to the plan. He claimed that the order was superfluous and would in no wise prevent the explosion of boilers and the consequent loss of life. The only result its passage would achieve would be to entail unnecessary expense upon local manufacturers. F. Dundon said that he was not opposed to the principle of the order, but desired to see it amended. He suggested that the aspirants for the position of inspector should be examined by a committee of nine persons, comprising three boiler-makers, three machinists and three steam-users, the committee to be appointed by the Board of Supervisors. He also objected to the exemption of insured boilers from the provision of the order. Arguments in favor of the order were made by representatives of the National and Pacific Coast Associations of Stationary Engineers, after which the committee decided to lay the matter over for a week for further consideration.

FRANK A. HUNTINGTON is sending his Huntington quartz-mills to Australia by every steamer. He is also selling a number of them in Mexico.

New York during the year, mainly for export, of the value of $57,507,812,42.

The Director sets forth at some length the causes of the recent large movement of gold from the United States.

Appropriations and Expenditures.

The amount appropriated for the support of the mints and assay offices during the fiscal year was $1,095,650, of which $994,989.71 was expended. In addition there was expended from the appropriation for the coinage of the standard silver dollar $224,155.05, and from an unexpended appropriation $116.60, making the total expenditures $1,219,261.36.

The net expenditures of the refineries was $153,022.12, against earnings amounting to $130,755.91. The total earnings of the mints from all sources amounted to $10,351,701.47, and the total expenditures and losses to $1,502,665 60, leaving the net profits for the year, $8,849,035.87.

Imports and Exports of Gold and Silver.

Imports: GOLD.		
Foreign bullion	$ 1,705,450	
Foreign coin	7,175,789	
Foreign ores	87,287	
Total foreign	8,968,526	
United States coin	1,403,619	
Total gold imports		$10,372,145
Exports:		
Bars	$50,786,393	
Domestic coin	4,143.939	
Domestic ores	80,961	
Total domestic	55,011,293	
Foreign bullion re-exported	31,933	
Foreign coin re-exported	4,990,020	
Total foreign	5,021,953	
Total gold exports		$60,033,246
Imports: SILVER.		
Foreign bullion	$ 5,713,049	
Silver in foreign ores	6,004,165	
Foreign silver coin	12,687,823	
Total foreign	24,405,037	
United States coin	277,343	
Total silver imports		$24,682,380
Exports:		
Domestic bullion	$25,217,903	
Domestic coin	66,759	
Total domestic	25,284,662	
Foreign coin re-exported	11,373,972	
Foreign bullion and ore re-exported	58,149	
Total foreign	11,432,121	
Total domestic and foreign		$36,716,783

Loss of gold and silver to the United States by export, 1889:

Gold	$49,661,101
Silver	12,034,403
Total	$61,695,504

The imports of silver-lead ores into the United States during the fiscal year amounted to 118,322 tons containing 58,679 609 pounds of metallic lead, valued at the custom-houses at $931,229, and silver $4,871,116.

The director estimates the metallic stock of the United States to have been on July 1, 1889:

Gold	$680,063,505
Silver	420,548,929
Total	$1,100,612,434

The amount of paper and metallic money in circulation in the United States (outside of the Treasury) on July 1, 1889, was $1,380,413,091, against $1,372,240,256 at the close of the preceding fiscal year, an increase in the circulation of $8,177,835.

The total metallic stock on Nov. 1, 1889, was estimated to have been:

Gold	$684,194,686
Silver	431,184,953
Total	$1,115,379,639

The consumption of gold and silver in the United States in the industrial arts for the fiscal year is estimated to have been:

Gold	$16,000,000
Silver	8,000,000
Total	$24,000,000

Of the gold, about $10,000,000 represented new product used for industrial purposes.

The product of gold and silver in the United States for the calendar year 1888 was:

	Fine ounces.		Value.
Gold	1,604,841		$33,175,000
		Com'l value.	Coining value.
Silver	45,783,632	$43,000,000	$59,195,000

The product of gold and silver in the world for the calendar year 1888 was:

		Value.
Gold		$105,894,150
	Commercial value.	Coining value.
Silver	$103,556,000	$142,439,150

The coinage of the world for the calendar year 1888 was:

Gold	$134,720,639
Silver	149,737,442

Deducting recoinages reported as the coinage of Mexican dollars, the net coinage approximated:

Gold	$109,000,000
Silver	95,000,000

Of the latter, about 80 per cent was full legal tender coins executed by the mints of the United States, India and Japan.

The director recommends legislation looking toward the discontinuance of the coinage of the $3 and $1 gold pieces and the 3-cent nickel piece, and the withdrawal from circulation of pieces of those denominations now outstanding.

The report is replete with interesting statistics as to the coinage, production and movement of the precious metals in the principal countries of the world.

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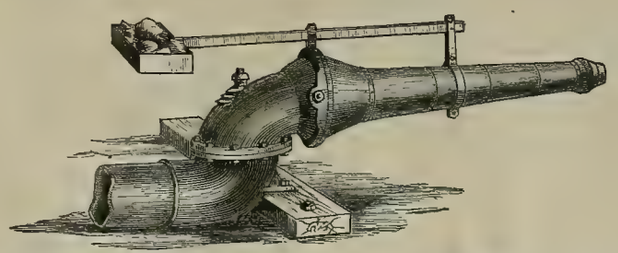
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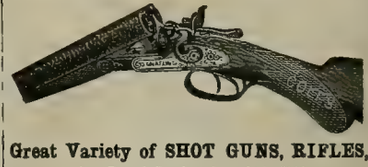
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List of U. S. Patents for Pacific Coast Inventors.

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FOR WEEK ENDING NOV. 5, 1889.

414,276.—SUPPLYING AND MEASURING AIR FOR CARBURETORS—E. B. Badlam, S. F.
414,365.—GRAIN RULE—J. Barker, Carson, Nev.
414,667.—PUMP—John Bean, Los Gatos, Cal.
414,281.—TRUSS—C. E. Bigelow, S. F.
414,382.—THRESHOLD—Daniel Dowd, Portland, Ogn.
414,384.—DOOR SPRING—A. Dudden, Santa Barbara, Cal.
414,304.—CABLE-CAR STOPPER—F. Espel, S. F.
414,306.—ANIMAL GUN—W. C. & S. Foreman, Bidwells Bar, Cal.
414,393.—COAL-WASHER AND GRADER—P. C. Forrester, Wilkeson, W. T.
414,394.—CONCENTRATOR—T. R. Garnier, San Jose, Cal.
414,307.—PULLEY—Gorham & Graham, S. F.
414,412.—MITER-BOX—W. S. Herrington, S. F.
414,421.—WOOD-SAWING MACHINE—M. W. Lipe, San Jose, Cal.
414,439.—TWO-WHEELED VEHICLE—Wilfred Page, Penns Grove, Cal.
414,322.—COAL-DUST FEEDER—E. Pait, S. F.
414,446.—DISH-WASHER—T. A. Pudan, Sacramento, Cal.
414,581.—AMALGAMATOR—N. L. Raber, Corvallis, Ogn.
414,330.—COIN-OPERATED PUNCHING MACHINE—G. F. W. Schultze, Alameda, Cal.
414,605.—SEAL-LOCK—Ten Eyck & Green, Oakland, Cal.
414,608.—GROUND-BONE FURNACE—E. Urbain, S. F.
414,346.—LAWN IRRIGATOR—W. Wainwright, S. F.

The following brief list by telegraph, for Nov. 13, will appear more complete on receipt of mail advices:

California—Ulrich Bachmann, St. Helena, cartridge loading machine; Guy W. Campbell, San Jose, assignor of one-half to J. Wood of Chico, fruit-pitting machine; Arthur H. Dauchy and P. Roberts, San Diego, pocket-folding rule; Frederic Euphrat, San Francisco, sight-exhibiting machine; Joseph R. Finney, National City, assignor by mesne, assignment of one-half to overhead conductor electric railway company, Pittsburg, Pa., electric locomotor; Benjamin Kenoyer, Huron, propelling mechanism for boats; Henry G. Kraspy, E. E. Lummatzsch and J. Kneffer, assignors to Golden Gate Automatic Street and Station Indicator Co., San Francisco, automatic station for railway cars; Laura S. McDonald, St Helena, easel; James P. Mighell and F. E. Gladwin, San Francisco, type-writer drop cabinet; John L. Stevens, assignor to Stevens' Fruit-Packing Case Co., fruit-packing case. Oregon—James W. Green, Albina, saw-filing machine. Washington—George W. Ansley and C. J. Schenck, Medical Lake, combination tool for carpenters' use.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

DEVICE FOR SUPPLYING AND MEASURING AIR FOR CARBURETORS—Edgar B. Badlam, S. F. No. 414,276. Dated NOV. 5, 1889. This is a machine for proportioning the mixture of air and hydrocarbon gases. It is employed in connection with carburetors in which an inflammable vapor or gas is produced by passing air through light gasoline or naphtha, this vapor, when properly mixed with atmospheric air, being suitable for illuminating purposes. It is a well-known fact that vapor produced from the liquid, when air is first passed through it, is very much richer and stronger than it is after a considerable amount of vapor has been taken away; and that in order to properly burn this vapor and make an equable and steady light it is necessary to mix a suitable proportion of air with the vapor, this proportion of air being greater as the vapor is richer and being reduced as the vapor becomes more impoverished. The object of this invention is to provide an apparatus by which a variable amount of air may be accurately supplied to the carburetor, and another volume simultaneously mixed with the vapor after this has been produced from the carburetor, the amount being increased in one instance in proportion as it is decreased in the other.

COIN-OPERATED PUNCHING OR STRIKING MACHINE.—G. F. W. Schultze, Alameda. No. 414,330. Dated Nov. 5, 1889. This is one of that class of machines which normally remain inoperative but are called into action by the operation of a coin deposited in a suitable receptacle in connection with the machine. The machine is intended for testing the striking or punching power. It consists in a hinged swinging padded flap, adapted to receive the blow, a spring or springs for resisting the force of the blow and controlling the movement of the flap, a register, and a connection between the register and the flap whereby the amount of its movement is determined, a locking device for holding the flap normally inoperative, and a tripping mechanism adapted to be operated upon the deposit of a suitable coin whereby the flap is allowed to come to an operative position. The patent also covers various minor details of construction and arrangement.

TWO-WHEELED VEHICLE.—Wilfred Page, Penns Grove, Sonoma Co. No. 414,439. Dated Nov. 5, 1889. This is one of that class of two-wheeled vehicles commonly known as "carts." The improvement consists in the novel connection and arrangement of parts, the object of which is to provide a cart in which the "horse motion" is obviated, so that the vehicle becomes an easy-riding, practical conveyance.

PULLEY.—Wm. J. Gorham and Marcellus A. Graham, S. F. No. 414,307. Dated Nov. 5, 1889. This improved construction of pulleye is more especially adapted for use upon small pulleys which receive a belt from a much larger one for the purpose of producing high speed, such as are used upon planing machines, generators for electric-lighting purposes and other machinery. In the use of very small pulleys it is almost impossible to prevent the belt from slipping and so causing irregular work. In this invention the pulley is composed mainly of what is known as "fibrous stock," which forms the exterior surface and body, and in connection therewith is employed a spider or core of iron or other metal, which forms a center, and a peculiar means for uniting the two together. A pulley made in this peculiar way presents a surface which will hold the belt so strongly that it will slip upon a large driving pulley sooner than it will upon this small pulley. The corrugated or channeled surface of the core prevents the material from crawling or working loose, as is the case where pulley-covers are placed upon the ordinary smooth pulleys.

COAL-DUST FEEDER.—Edmond Pait, Berkeley, assignor of two-fifths to B. C. Turner, S. F. No. 414,322. Dated Nov. 5, 1889. The operation of the feeder is as follows: The coal having been previously pulverized, is deposited in the hopper, and by the action of stirrers is fed positively into a communicating pipe. The blower draws in air through the inlet pipe, and said air passing through a portion of its course within the smokestack is thereby heated, and, being driven out through the discharge pipe of the blower, creates a suction in the communicating pipe and carries the powdered coal or dust with it through the discharge pipe and the branches thereof into the nozzles, by which it is discharged into the fire-box from each side. Here the heavier particles, dropping on the grate-bars, soon accumulate and keep the fire alive, while the dust igniting at once, furnishes the necessary heat for the boiler. After steam is first gotten up, which can be done quickly by this device, the operation is continuous.

PUMP.—John Bean, Los Gatos, Santa Clara Co. No. 414,667. Dated Nov. 5, 1889. This invention consists in a novel improvement in the plunger, a novel improvement in the bottom or check-valve, and a novel improvement in the outlet from the cylinder and plunger in connection therewith.

ANIMAL GUN.—W. C. and Stanton Foreman, Bidwell's Bar, Butte Co. No. 413,306. Dated Nov. 5, 1889. This invention relates to that class of guns for killing gophers, ground-squirrels, moles and other burrowing animals, in which the hammer is released by the action of a trigger-connection projecting in front of the muzzle of the gun and into the burrow and path of the animal. The object of the invention is to provide a simple and effective gun which, though adapted for killing larger animals, is especially intended for burrowing animals, such as gophers, moles, etc.

WOOD-SAWING MACHINE.—Milon W. Lipe, San Jose. No. 414 421. Dated Nov. 5, 1889. This is a machine for sawing wood into short lengths and carrying away the severed lengths as fast as they are cut off.

TRUSS.—Charles E. Bigelow, S. F. No. 414,281. Dated Nov. 5, 1889. This invention consists in the combination with a suitable frame and a pad for the relief of femoral hernia, and the novel connection of said pad with the frame, whereby the latter is guided, directed and held well in place. The object is to provide a simple and effective truss for the relief of femoral hernia, said truss being incidentally adapted also for the relief of inguinal hernia when required.

LAWN IRRIGATOR.—Wm. Wainwright, S. F. No. 414,346. Dated Nov. 5, 1889. This improved adjustable lawn irrigator consists of a socket having one or more discharge openings, either vertical, horizontal, stationary or rotary, and a means for adjusting and regulating said openings. The adjustments of the sleeves will also increase or diminish the amount of water which will be thrown by the arms.

CABLE CAR STOPPER.—Ferdinand Espel, S. F. No. 414,304. Dated Nov. 5, 1889. The object of this invention is to automatically stop a cable car; this result being effected upon contact with an obstructing body of any kind, whereby injury to the said body or to the car or to the passengers in the car may be prevented.

Thanksgiving.

The Governor of the State has followed usage and President Harrison's example by issuing the following proclamation:

STATE OF CALIFORNIA,
EXECUTIVE DEPARTMENT.

To all to Whom the-e Presents shall Come, Greeting:

In accordance with the time-honored custom that one day in each year be set aside and devoted to prayer and thanksgiving to the Almighty Creator and Ruler of the Universe for the manifold blessings He has vouchsafed the people of these United States of America, I hereby appoint Thursday, Nov. 28, 1889, as such day, requesting the people of this State to abstain from all their usual vocations and consecrate that day to the worship of God.

In witness whereof, I have set my hand and caused the great seal of the State to be hereunto affixed, at the city of Sacramento, on this the eighth day of November, Anno Domini one thousand eight hundred and eighty-nine.

R. W. WATERMAN, Governor.

Attest: W. C. HENDRICKS, Secretary of State.

Mining Personals.

R. W. Waterman, Governor of California, on being asked if the anti-debris decision would ever be overcome and the miners allowed to work gold out by hydraulicking, said: "I have given that matter a good deal of attention. I am an old prospector myself, and labored four years with the pick and shovel after I came here. It is my idea that the only solution of the silt problem is to build great flumes high up on the Feather, Yuba and American rivers, and let these flumes bear the debris far below to the swamp lands and deposit it there. In two or three years, by exposure to the air, the debris would become fertile and thus gold-mining could go forward while large areas were reclaimed. The rivers would not get filled up, and thus good would result to everybody. This is the solution of the problem that I have thought of. There should be some means to relieve the miners, and flumes seem to be what should be adopted. The miners are loyal to the State's interests in every way. They won't employ Chinese at all, and in many of the mountain regions you won't see a Chinaman within a hundred miles."

Work on the Alexander mine at Grantsville, Nev., is pushed with energy, under the superintendence of Thos. Mitchell.

Major E. A. Burke is on the way from New York with Wm. Hodding, agent of the Rothschilds, and mining engineers Douglas, Brown and Phillips, for San Francisco, and from here will go to Honduras to work mines owned by an English company. Eugene A. Tucker of this State will accompany the party and have charge of the placer mining operations. It is said 2000 native laborers will be employed by the London companies. The party will sail from here to Amalpa, on the Pacific Coast of Honduras, and thence proceed to Juticalpa, the nearest town to the mines.

Major Frank McLaughlin of the Golden Gate river mine, Butte county, has gone East on his way to London. The English owners are anxious to know details of the recent disaster by which the flood carried away the dam. A great part of the flume was saved, however. The dam will be rebuilt next season.

Assessment Notices.

Gray Eagle Mining Company, Location and principal place of business, San Francisco, California. Location of Works, Placer Co., Cal.

NOTICE is hereby given that at a meeting of the Board of Directors, held on the 16th day of October, 1889, an Assessment, No. 15, of Six (6) Cents per share was levied upon the Capital Stock of the Corporation, payable immediately, in United States Gold Coin, to the Secretary, at the office of the Company, Room 11, No. 303 California St., San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 18th day of November, 1889, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Tuesday, the 10th day of December, 1889, to pay the delinquent assessment, together with the cost of advertising and expenses of sale.

By order of the Board of Directors.

J. M. BUFFINGTON, Secretary.

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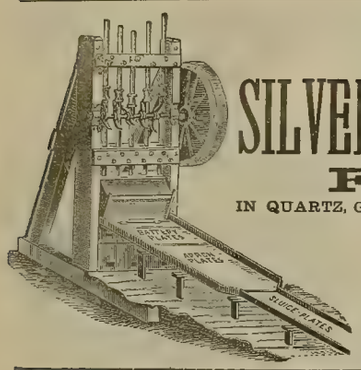
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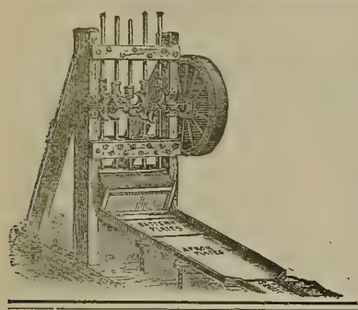
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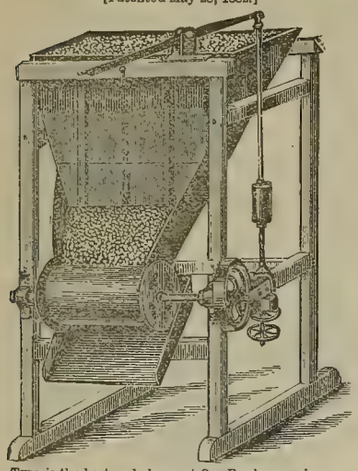
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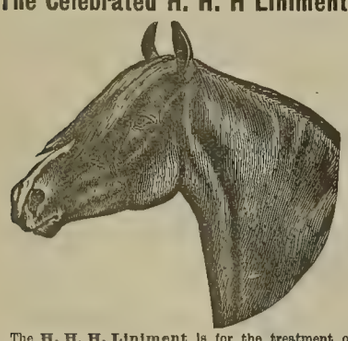
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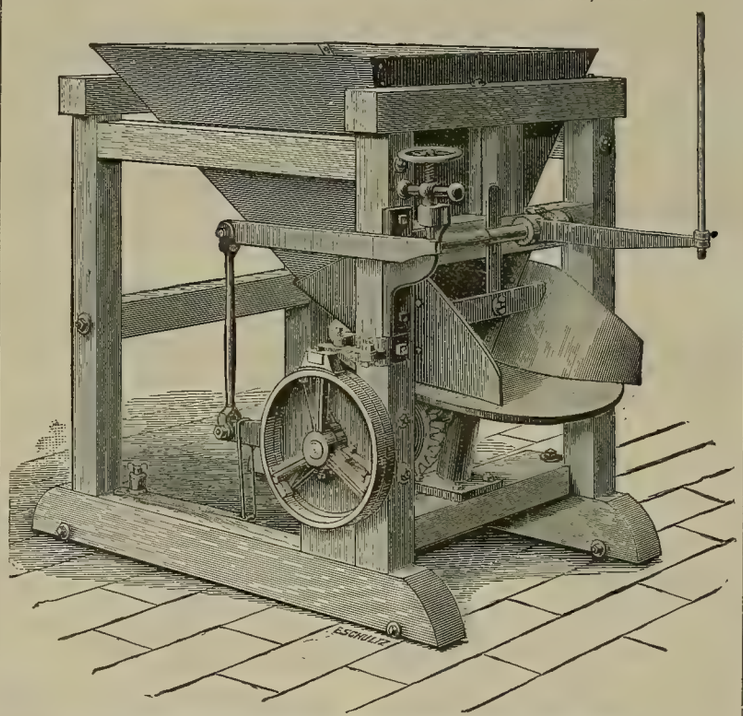
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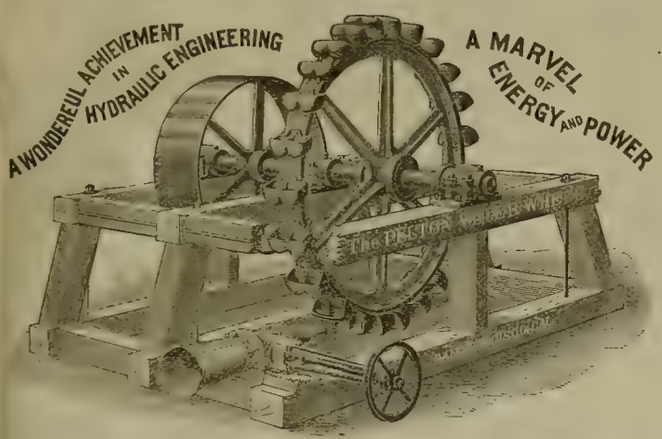
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From 12 to 20 per cent better results guaranteed than can be produced from any other Wheel in the Country.

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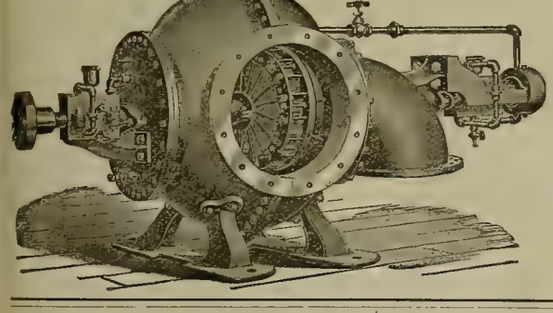
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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price. Our New Illustrated Catalogue, with prices, will be sent on application.

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Ores worked by any Process.

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Nov. 14, 1889.

General trade continues fairly active. Iron-workers and manufacturers in general are doing a fair business, but in 1890 they look forward to a large increase in orders. The money market shows continued ease under free remittances from the interior, and only a slight outward flow of coin. The growing ease in the European and Eastern money centers is an important factor in producing ease with us.

The British steamer Arabic, hence Nov. 9th, for China, etc., carried the following shipments of treasure:

TO HONGKONG.

Chinese, Mexican dollars	$163,443 00
Chinese, gold coin	46,470 00
Chinese, gold dust	1,596 00
Anglo Californian Bank, Mexi an dollars	185,000 00
Hongkong and Shanghai Bank, Mexican dol.	370,000 00
Hongkong and Shanghai Bank (bullion)	250,000 00
Total	$1,015,509 00

MEXICAN DOLLARS—Following the sailing of the last steamer for China, the market has been quiet, with a slight shading in prices, quotable at 77c. The advance in silver bullion, no doubt, caused freer buying by the Chinese last week, but at the close they are holding off.

SILVER—The market after advancing in London to 43 15-16d, fell back yesterday to 43 11-16d. This decline was generally expected after so rapid an advance, but well informed financiers look for still higher prices. Their views coincide with the writer's, which are based on the following: Increased prosperity and more general activity in trade in Europe calls for an increased metallic currency, which is naturally met by the issuing of smaller silver denominations so as to pay off the working hands. The minting of silver brought the English Government in the market as a buyer of the bullion. This, with the demand from the East Indies, caused a livelier buying competition. The English Government is paying off its employes in silver, so as to retain in bank as much gold as possible against the heavy withdrawal of that coin from the European center for shipment to Brazil and other countries. As stated last year by the writer, India's Council bills will lessen each year, which will have to be met by heavier purchases of silver. Russia's improved financial standing takes out of the market the rouble, and it will also cause that country to coin more freely in the near future. A renewal for six years of the "Latin Union" has a strengthening effect on silver, as has the favorable effect of the agitation in this country on the silver question. It is now generally accepted that the incoming Congress will authorize the minting monthly of $4,000,000 of silver, and possibly legislate still further in the interest of the metal. The bugaboo raised by some of a very large increase in the silver mined in the event of higher prices for the bullion is nonsensical, and evidently put out so as to boom what is called outside mining stocks. It would surprise many of these theorists if one or more outside districts should develop a large body of rich-paying gold quartz, and that the Comstock's ore gave a much larger percentage of gold than of silver.

In connection with the above we give the following just to hand from New York: "Great Britain is beginning to feel the necessity of doing what is possible to prevent further depreciation of gold, and has begun calling in all the half sovereigns, with the intention of replacing them with silver, so that there will be no gold coin of a value less than a sovereign."

London cables came through to-day at 43⅝ to 43 11-16d. In our market there is a good inquiry with buyers naming 95¼c, but sellers say 96c is obtainable. The supply is light, owing to the market having been well cleaned up for shipment on the last outgoing China steamer.

QUICKSILVER—The market is strong at an advance, with more business doing. Receipts the past week aggregate 435 flasks, and exports, 127 flasks to Mexico.

BORAX—Receipts the past week aggregate 242 ctls., and exports by sea 400 ctls. to New York and 115 lbs. to Mexico. The market is very strong at unchanged quotations.

LIME—Receipts the past week aggregate 7805 bbls. and the exports by sea 800 bbls. to Honolulu. With improved weather the consumption shows a large increase.

TIN—The market for both plate and pig is quiet but strong. European advices report a strong and active market, due chiefly to the advance in iron having stimulated the movement. China is still said to be a large buyer. During the past week the imports aggregate 250 boxes plate by railroad from the East.

LEAD—The market is reported unchanged. There was a stronger feeling under an advance at the East, but at the close it is easier. Several large parcels are reported to have been closed out at the East.

COPPER—The market is very strong in sympathy with higher markets in Europe and at the East. The strength of the market while in part due to more attention given to the metal since the boom in iron, is more directly owing to the large increased consumption throughout the world. This is reflected in the lessened visible supply, which was on Nov. 1st, 2561 tons less than on Oct. 1st. Present advices warrant the assertion that the visible supply will be largely reduced this month. Chili is resuming shipment, the advance in copper allowing shippers to pay the increased freights.

IRON—Imports the past week aggregate 100 tons from Irondale. The local market is quiet but strong at an advance. Importers claim that further advances can be looked for in the near future. Eastern advices report orders booked into February, with all consumers buying freely. The sales of Lake Superior iron ore up to Nov. 1st aggregate about 1,000,000 tons more than for the like time in 1888. English mail advices report a strong and active consumptive market, while later advices by cable report that a jump in prices caused more or less of a panic with large consumers who had ships on the stocks.

The following are the latest comparative quotations f. o. b. at Glasgow:

	Nov. 6, '89.	Oct. 30, '89.
F. o. b. Glasgow.		
No. 1 Coltness	75s	76s
" Langloan	75s	75s
" Summerlee	75s	75s
" Gartsherrie	76s	75s
At Ardrossa.		
No. 1 Eglinton	62s 6d	61s
" Glengarnock	75s	75s
" Dalmellington	62s 6d	62s

COAL—Imports the past week were as follows: From Coos Bay, 1750 tons; Nanaimo, 3004; Seattle, 7266; Sydney, 7197; Overland, 40; Departure Bay, 2400; Tacoma, 2700; Iquique 629; Newcastle, N. S. W., 11,224. Total, 36,210 tons. Cannel coal has been advanced, but other kinds are unchanged, with perhaps a slightly easier tone ruling for household. The weather, while favorable for steam coals, is against household coals. There are conflicting reports regarding the stock in the yards, but the general advices concur in stating they are only fair; while consumers are reported to have bought more freely than usual. Unless severe cold weather sets in soon, it is thought that coast coals will shade off some.

Eastern Metal Markets.

By Telegraph

NEW YORK, Nov. 14, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	43⅛	95½	$12 00	$3 92½	$22 15
Friday	43 15-16	95½	12 10	3 92½	22 10
Saturday	43 15-16	95½	12 10	3 92½	22 10
Monday	43 15-16	95½	12 25	3 92½	22 15
Tuesday	43 15-16	95½	12 50	3 87½	21 95
Wednesday	43 11-16	94½	12 75	3 82½	21 90

NEW YORK, Nov. 13.—Borax steady, with a fairly free supply. Quicksilver quoted at 68@69c; good market. Copper has a boom, closing strong at an advance. About 1,500 000 pounds of Lake Superior ingot sold during the week at 11½@12¼c. The latter price is now bid for both near and distant futures. Of the casting brands the sales reach as great if not a larger total, at prices ranging from 10¼@11¼c, considerable Arizona bringing 10⅞@11¼c. Pig lead partakes of the general activity pervading the metals. Spot, $3.90 bid. Sales, 2000 tons. November and December, $3.85@3.90; January to April, $4.02½. At the close the market is easier.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, November 14, 1889.

ANTIMONY	19 @ 20
BORAX—Refined, in carload lots	7¼@ 7¾
" Powdered " " "	7¼@ —
" Concentrated " " "	— @ 6¾
All grades jobbing at an advance.	
COPPER—	
Bolt	21 @ 22
Sheathing	22 @ 24
Ingot, jobbing	16 @ 18
do, wholesale	14 @ 15
Fire Box Sheets	22 @ 24
LEAD—Pig	4¼@ —
Bar	5 @ —
Sheet	7 @ —
Pipe	6 @ —
Shot, discount 10% on 500 bags Drop, ₩ bag.	1 45 @ —
Buck, ₩ bag	1 65 @ —
Chilled, do	1 85 @ —
STEEL—English, lb	16 @ 20
Cantou tool	9 @ 9
Black Diamond tool	9 @ 9
Pick and Hammer	8 @ 10
Machinery	4 @ 5
Toe Calk	4½@ —
TINPLATE—B. V., steel grade, 14x20, P. S.	5 37½@ —
B. V., steel grade, 14x20, spot	5 00 @ —
Charcoal, 14x20	6 75 @ 7 00
do roofing, 14x20	5 50 @ —
do, do, 20x28	11 00 @ —
Pig tin, spot, ₩ lb	21½@ 22½
COKE—Eng., ton, spot, in blk & sks, reptvly	16 00 @18 00
Do, do, to load	13 50 @14 50
QUICKSILVER—By the flask	— @48 00
Flasks, new	@ —
Flasks, old	35 @ —
CHROME IRON ORE, ₩ ton	10 00@ —

IRON—Glengarnock ton	Spot. 35 00 @—	To Load. 32½@ —
Eglinton, ton	35 00 @—	32½@ —
American Soft, No. 1, ton	— @35 00	32½@ —
Oregon Pig, ton	— @35 00	— @ —
Clay Lane White	— @28 00	26 @ —
Shotts, No. 1	35 00 @35 00	32½@ —
Bar Iron (base price) ₩ lb	— @ —	— @ —
Langloan	35 00 @—	32½@ —
Thorncliffe	35 00 @—	32½@ —
Gartsherrie	35 00 @—	32½@ —

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	7 75 @ 8 00	Cardiff	9 50@10 00
Liverpool St'm	8 50 @— —	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	9 00 @ 9 00	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Gilman	7 00
Scotch Splint	9 00	Seattle	7 00
Greta	9 00	Coos Bay	6 00
Westminster Brymbo	9 00	Cannel	12 00
Nanaimo	9 00	Egg, hard	18 00
Sydney	8 0	Cumberland, in sacks	19 00
Jackson	6 00	do, bulk	18 00

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Con. California and Virginia, Nov. 9, $140,335; total for October, $282,680; Eureka Con., 9, $38,000; Richmond Con., 9, $19 960; Mt. Diablo, 12, $5394; Germania, 6, $5609; 7, $5705; Hanauer, 12, $4775; Germania, 10, $4573; Hanauer, 10, $2650; Young America (for October) $26,800; Sierra Buttes (for October), $7500; Mt. Diablo, 14, $5394.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

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COMPANY.	LOCATION.	No.	AM'T.	LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Belcher M Co	Nevada	13	50	Oct 17	Nov 20	Dec 11	John Crockett	327 Pine St
Central California Oil Co	California	1	50	Sept 6	Nov 1	Nov 18	F L Gorlinski	314 California St
Cadmus M Co	Nevada	—	20	Sept 19	Oct 31	Nov 25	J Craig	204 California St
California State Co	California	5	25	Oct 21	Nov 26	Dec 23	J O Hanscom	9 Mission St
Con Pacific M Co	California	11	10	Nov 1	Dec 5	Dec 28	F R Luty	330 Pine St
Chollar M Co	Nevada	28	50	Nov 1	Dec 24	Dec 31	C E Elliott	309 Montgomery St
Del Monte M Co	Nevada	2	20	Oct 28	Dec 3	Dec 26	J W Pew	310 Pine St
Grand Prize M Co	Nevada	22	30	Sept 24	Oct 28	Nov 19	R R Grayson	327 Pine St
Golden Jacket M Co	Nevada	3	10	Oct 14	Nov 21	Dec 20	R G McClellan	331 Montgomery St
Golden Prize Con M Co	Nevada	3	25	Sept 21	Oct 26	Nov 16	C D Bennett	330 Pine St
Gould & Curry M Co	Nevada	63	30	Oct 15	Nov 18	Dec 11	A Durbrow	309 Montgomery St
Gray Eagle M Co	California	15	6	Oct 16	Nov 18	Dec 10	J M Buffington	303 California St
Locomotive M Co	Arizona	5	5	Oct 19	Nov 25	Dec 17	A H Fish	309 Montgomery St
Lapanta Con M Co	Nevada	2	02	Oct 2	Nov 8	Dec 2	J Stadfeldt	309 Montgomery St
Mexican M Co	Alaska	1	25	Oct 11	Nov 16	Dec 2		
Navajo Queen M Co	Nevada	2	10	Oct 23	Nov 26	Dec 11	J F Holling	533 Kearny St
North Gould & Curry M Co	Nevada	11	20	Nov 6	Dec 7	Dec 27	O H Mason	331 Montgomery St
Nevada Queen M Co	Nevada	6	20	Oct 31	Dec 4	Dec 30	H Deas	309 Montgomery St
Oak Con M Co	California	4	7	Sept 5	Oct 19	Nov 20	E J Ryan	230 Montgomery St
Phil Sheridan Con M Co	Nevada	4	10	Oct 22	Nov 26	Dec 11	J F Holling	533 Kearny St
Peerless M Co	Arizona	13	10	Oct 11	Nov 19	Dec 10	A Waterman	309 Montgomery St
Palisade M Co	Nevada	2	5	Nov 1	Dec 16	Jan 9	D Buck	309 Montgomery St
Si ver Hill M Co	Nevada	25	20	Sept 27	Oct 31	Nov 25	D C Bates	309 Montgomery St
Sierra Nevada	Nevada	96	50	Oct 5	Nov 3	Dec 7	E L Parker	309 Montgomery St
Savage M Co	Nevada	4	25	Oct 7	Nov 4	Dec 8	E A Holmes	309 Montgomery St
Tuscarora Con M Co	Nevada	2	50	Nov 5	Dec 10	Dec 30	E B Holmes	309 Montgomery St
Trojan M Co	Nevada	18	10	Oct 23	Nov 26	Dec 11	J F Holling	533 Kearny St
True Con M Co	California	7	24	Aug 31	Oct 12	Nov 16	J C Bates	434 California St
Utah Con M Co	Nevada	8	25	Oct 23	Nov 26	Dec 16	A H Fish	309 Montgomery St
Union Con M Co	Nevada	39	25	Oct 8	Nov 9	Dec 13	J M Buffington	303 California St
Vine Spring M Co	California	1	15	Oct 10	Nov 11	Dec 9	F S Snell	218 Sacramento St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Challenge Con M Co		C L McCoy	329 Pine St	Annual	Nov 21
California Slate Co	California	J O Hanscom	9 Mission St	Special	Nov 25
Puget Sound Iron Co	Oregon	A Halsey	328 Montgomery St	Annual	Nov 16

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	AMOUNT.	PAYABLE
Champion M Co		T Wetzel	522 Montgomery St	10	Oct 15
Caledonia M Co	Nevada	A S Cheminant	328 Montgomery St	08	Aug 5
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	Sept 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	Aug 25
Idaho M Co	California		Grass Valley	5 00	Nov 7
Mt Diablo M Co	Nevada	R Heath	319 Pine St	30	Oct 23
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Nov 10

Mining Share Market.

The mining share market for the Comstocks showed general activity up to the close of business on last Saturday, but for the remainder of the week under review trading was exceedingly light. The market has had, throughout the week, every indication of going to pieces, giving comfort to the short interest and carrying consternation to the longs, particularly those on a margin. As yet, the long-talked-of and very generally expected setback from 10 to 20 per cent from last Saturday's prices, has not materialized. There is no doubt but many outsiders sold in expectation of it, while others are waiting for the lower prices so as to buy. The action of the market warrants the assertion that a master hand is at the helm, for a more puzzled lot of outside dealers has seldom been seen. It acts as if the manipulators had been studying to advantage one of ex-United States Senator Fair's successful deals of days gone by. To guess his deals or tell where an ore development would be made, the very best were more often wrong than right. There can be no doubt but the pool has taken in large lines of stocks, and when they have all they want to make a successful upward move without expending many twenty-dollar pieces, a small ore development is likely to be made, so as to peddle out the stock on those of the public who avoid assessments and buy at higher prices for expected dividends. In outside stocks the Tuscaroras, under the leadership of North Belle Isle and Nevada Queen, made an upward move of about 50 per cent, but soon fell back. It now looks as if the upward move is not through with, for not enough stock has as yet been peddled out, although if many outsiders buy at the setback for another decided upheaval in prices, the stocks may sink to a lower level and not recover before next spring. The other outside stocks were lifeless, owing to assessments falling due and the fears of others to be levied. The Bodie officials appear happy, as the stock has been assessed, which insures the regular payment of their salary, provided the public pays it. Mono is to be assessed soon, probably when Bodie's becomes delinquent.

From the mines reliable private news is hard to get. The scarcity of information, only such as is obtainable from official reports, from the Comstocks has heretofore been a forerunner of a deal in their stocks. Official news from Consolidated Virginia reports lower assays for the ore, which causes the bears to rejoice. Our own advices are confirmatory that higher grade ore can be milled if it is desirable. In Union another west crosscut has been started on the 1465-foot Ophir north drift. It looks as if the managers of the north end mines are thoroughly prospecting the body of ore lying to the west. This ore, it is said, they first found in Sierra Nevada in 1878, afterward they found it in Belcher, then in Crown Point, then in Mexican, afterward in Alpha, and are running for it in Yellow Jacket, Challenge, Confidence and Consolidated Imperial. In the last three mines west crosscuts are being run on the 300, 500 and 800 levels. In Crown Point and Belcher important work to the west is under way. The former mine is shipping ore to the mill for reduction, and assays, so private advices report, over $20 a ton. Well-informed miners are watching with close interest the work going on in and around the Ward shaft, looking to the more thorough development of Potosi, Bullion, Exchequer, Julia and Alpha. The ore milled by the Hale & Norcross assays over $31 a ton and that of Savage over $25 a ton.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, department 10, San Francisco:

SAN FRANCISCO MANUFACTURING AND IMPROVEMENT CO., Nov. 13th. Capital stock, $100,000. Directors—J. K. Luttrell of Sonoma county, J. W. McDonald, J. J. Scrivner, A. A. Hoyt, E. P. Fish, all of this city, and A. J. Meany of Merced.

KASLUK RIVER SALMON CO., Nov. 13th. Object, to catch and can salmon, also, to mine for gold, silver and coal. Capital stock, $500,000. Directors—T. M. Antisell, Jr., A. J. Rhorer, A. A. Hoy, C. M. Arnold, H. Hoyt, J. M. Day, J. N. Miller, W. B. Benchley, J. F. Harris, J. G. Steele and H. O. Clark.

THE city of Canton, China, is to be lighted by electricity. The plant has been shipped from this city—the first one ever sent to China.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 24.		WEEK ENDING Oct. 31		WEEK ENDING Nov. 7.		WEEK ENDING Nov. 14.	
Alpha	1.00	1.15	1.25	1.50	1.30	1.50	1.35	1.55
Alta	2.00	2.30	2.05	2.40	2.10	2.25	2.15	2.30
Andes	.55	.60	.60	.75	.60	.30	70	.75
Belcher	2.00	2.30	2.30	2.80	2.25	2.70	2.25	2.45
Best & Belcher	2.80	3.1	2.95	3.95	3.25	3.85	3.40	3.75
Bullion	.50	.55	.65	.75	.60	.70	.60	.70
Bodie Con	....	....	.75	.85	.65	.75	.65	.75
Benton	....	....	....	....	3.25	3.25	3.25	....
Bulwer	.15	.30	.25	....	.25	.35	.30	.35
Commonwealth	2.95	3.00	2.80	3.05	3.00	3.10	3.05	3.20
Con. Va. & Cal	54	56	5.50	60	55	62	05	7
Challenge	1.90	2.10	2.10	2.50	2.10	2.50	2.05	2.10
Chollar	1.45	1.65	1.50	2.10	1.60	2.00	1.85	1.90
Confidence	6.00	....	6.3	7	.52	.60	52	52
Con. Imperial	.30	.35	.35	.45	.35	.40	.35	.35
Caledonia	....	....	.20	....	.25	....	....	....
Crown Point	2.00	2.50	2.55	3.15	2.60	3.00	2.65	2.95
Crocker	.45	....	.50	....	.40	.50	.35	.40
Eureka Con	3.60	4.50	4.10	4.25	4.10	4.50	4.10	4.40
Exchequer	.55	....	.55	.70	.55	.70	.65	.70
Grand Prize	.55	.60	.50	.90	.80	.90	80	.85
Gould & Curry	1.35	1.55	1.50	2.00	1.50	1.85	1.55	1.80
Hale & Norcross	2.75	2.95	2.80	3.35	2.80	3.30	3.00	3.20
Julia	.20	....	....	....	.30	.40	.40	.50
Justice	1.40	1.50	1.45	2.00	1.70	2.00	1.65	1.80
Kentuck	1.00	....	1.00	1.20	1.05	1.20	1.15	....
Lady Wash	.35	....	.40	....	.40	....	.40	....
Mono	.40	.55	.50	.65	.55	.65	.50	.60
Mexican	3.10	3.60	3.30	4.40	3.65	4.20	3.70	4.10
Navajo	.35	....	....	....	....	....	.35	.35
North Belle Isle	.70	.93	.85	.90	.90	1.00	1.05	1.52
Nev. Queen	.60	....	.55	.70	.65	.70	.75	1.00
Occidental	1.00	1.15	1.10	1.40	1.15	1.35	1.20	1.30
Ophir	3.70	4.20	4.00	5.00	4.30	4.95	4.60	4.95
Overman	.80	.95	.90	1.10	1.00	1.05	.95	1.15
Potosi	1.05	1.60	1.50	2.10	1 07	2.05	1.75	2.00
Peerless	.20	....	.25	....	.25	.30	.20	.35
Peer	....	....	....	....	.15	....	.15	.25
Savage	1.60	1.70	1.50	2.10	1 45	2.00	1.55	1.75
S. B. & M	1.05	1.15	1.25	1.55	1.15	1.50	1.65	1 70
Sierra Nevada	1.55	1.90	1.60	2.15	1.70	2.20	2.50	2.70
Silver Hill	.15	.20	.15	.60	.55	.50	.45	.50
Scorpion	.25	....	.20	.25	.25	....	.25	....
Union Con	2.60	2.85	2.75	3.2	2.70	3.15	3.10	3.45
Utah	.65	.85	.70	.90	.80	.90	.70	.80
Weldon	....	....	....	....	....	....	....	....
Yellow Jacket	2.75	3.55	2.75	3.40	2.75	3.25	3.00	3.20
....	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY, Nov. 14, 9:30 A. M.

100	Alta	2.10	400 Mexican 3.75
100	Alpha	1.55	150 Nev. Queen 80c
100	Belcher	3.45	150 N. Belle Is 1.25
100	B. & Belcher	3.45	400 N. Commonwealth 90c
350	Bodie	70c	50 Ophir 4.50
250	Bullion	65c	100 Potosi 1.80
150	Con Va & Cal	6.30	200 Savage 1.55
200	Chollar	1.65	50 Sierra Nevada 2.55
350	Commonwealth	3.05	100 S. B. & M 1.55
180	Gould & Curry	1.60	100 Silver Hill 45c
175	Hale & Nor	3.00	140 Silver King 40c
100	Julia	45c	150 Union 3.40
150	Justice	1.60	100 W Comstock 28c

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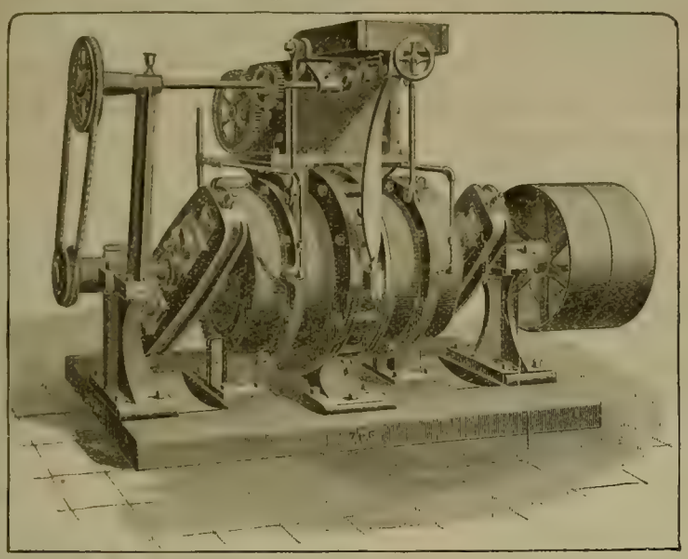
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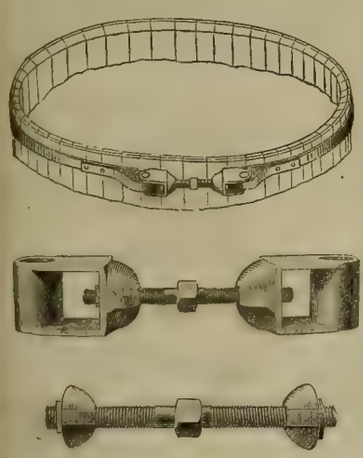
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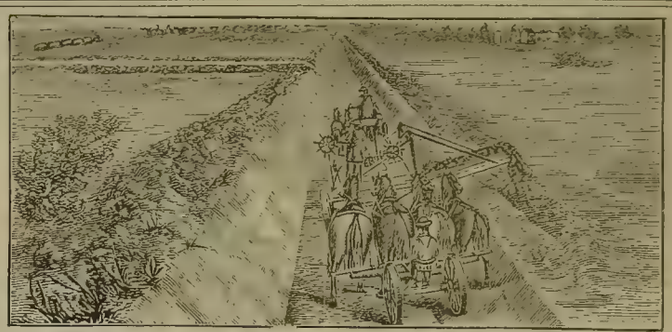
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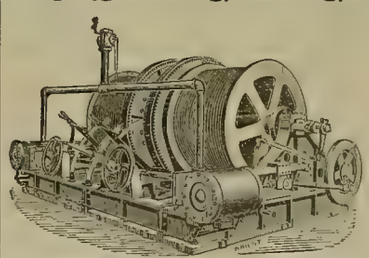
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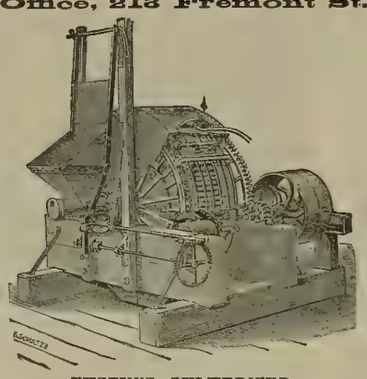
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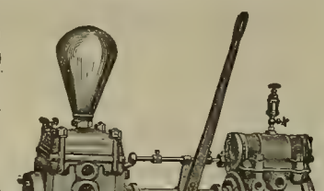
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Of Different Strengths as Required.

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Zinc, Copper or Brass Screens for all purposes. California Perforating Screen Co., 145 & 147 Beale St., S. F.

COAL MINES OF THE WESTERN COAST.

A few copies of this work, the only one ever published treating of Pacific Coast Coal Mining, have been obtained, and are for sale at this office for $2.50 per copy. It was written by W. A. Goodyear, Mining and Civil Engineer, formerly of the California State Geological Survey.

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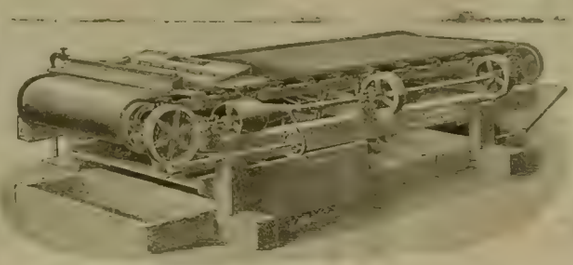
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Price of Improved Belt Frue Vanner, $900, f. o. b.
Price of Plain Belt Frue Vanner, $575, f. o. b.

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Protected by Patents December 22, 1874; September 2, 1879; April 27, 1880; March 22, 1881; February 20, 1883; September 18, 1883; July 24, 1888. Patents applied for.

There are Over 2200 Plain Belt Machines now in Use.

THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 41 additional Frues and more stamps have been purchased. ADAMS & CARTER.

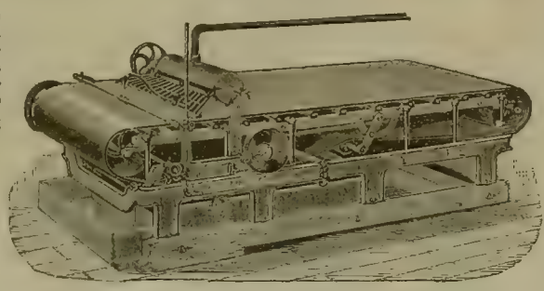
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The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - - $650 f. o. b.
Price "Triumph" Concentrators, with Plain Belt - - - - - - - $550 f. o. b.

We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need be. Circulars and testimonial letters furnished on application.



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(PATENTED.)
Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

Original Empire Mill and Mining Company,
Principal Office, 401 California S., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Emipre Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

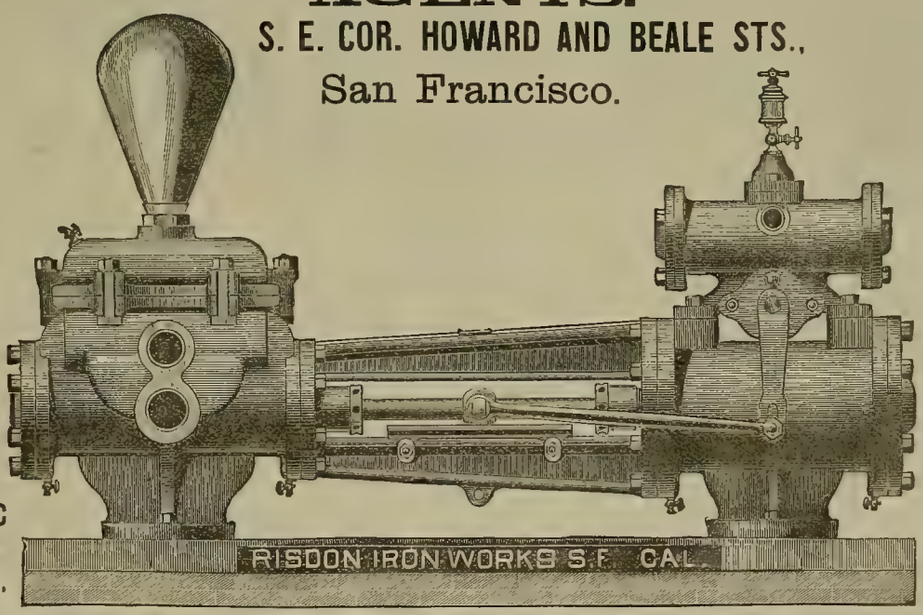
At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vann or concentrating devices. DAVID McKAY, JR.,
[Signed] Sup't North Star and Original Empire Mining Co

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

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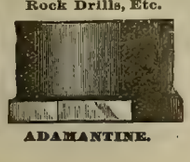
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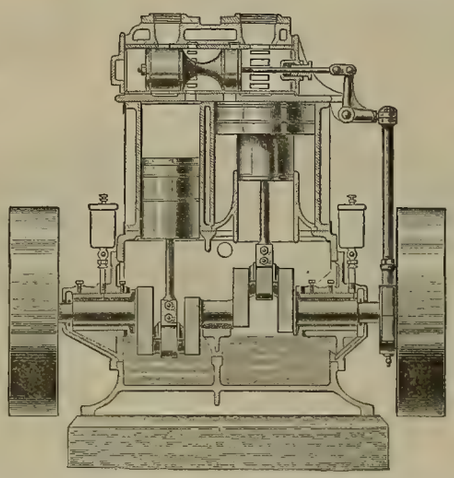
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LIX Number 21.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, NOVEMBER 23, 1889.

Three Dollars per Annum.
Single Copies, 10 Cts.

Ore-Dressing Works.

Cuts showing a transverse section of the new dressing of the St. Joseph Lead Co., Bonne Terre, Missouri, are given herewith. The new mill is a two-story structure, and is the result of many years' study and experiment in the old ore. On the main floor are the ore bins, roughing jigs and tables. All the work requiring abundance of light and careful supervision is on the main floor. The roof is a mere umbrella of corrugated iron supported on slender columns. All the jarring machinery is as near the ground as possible. The roll screens, centrifugals, spitzkarten, chat-tanks and galena-boxes are on the lower floor. The shafting, gearing, pulleys and belts are below the main floor. By this arrangement the heavy framing is confined to one story, and there is an absence of overhead machinery and apparatus. All the clarifying and settling tanks, with their enormous weight of water, rest directly on the ground. We take these cuts from a paper read before the American Institute of Mining Engineers, by H. S. Munroe of the School of Mines, N. Y.

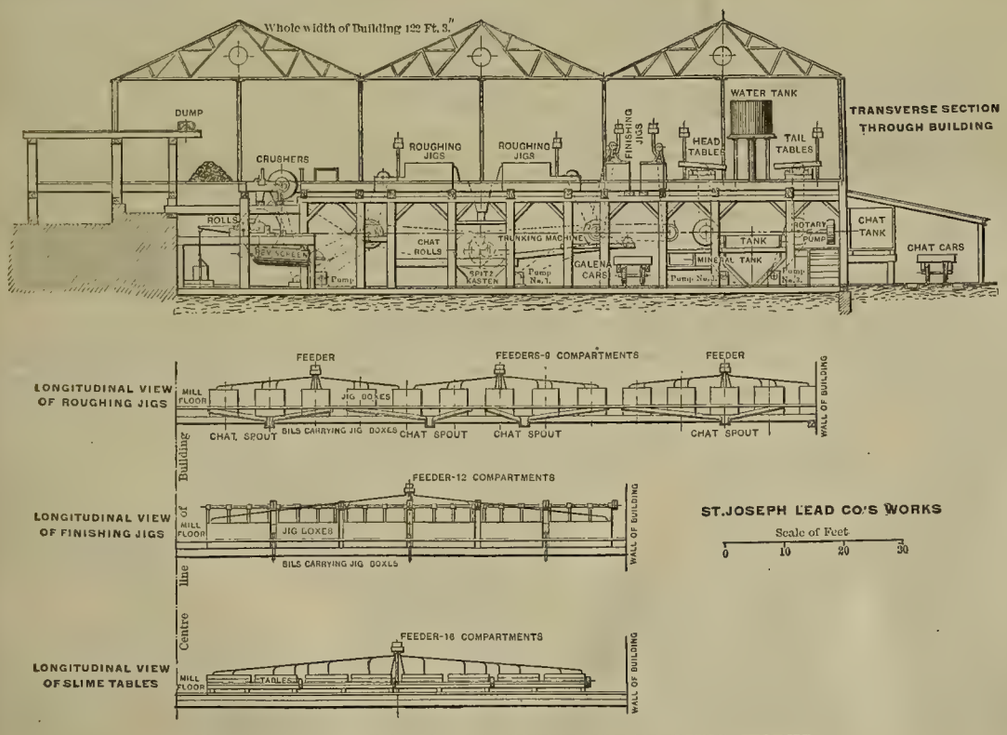
Moving Ore From Open Workings.

The methods devised at the Tilly Foster iron mine, Putnam Co., N. Y., for the rapid removal of rock and ore are worthy of consideration. At the narrow ends of the ore body steam-derricks are in use, and across the intervening space of about 300 feet, four cables have been stretched. Two of these, shown in the accompanying engraving, are horizontal cables two inches in diameter, supported at each end by well-braced towers, and strongly anchored into the rocks. On each cable a trolley is moved back and forth by a traversing rope, passing around one drum of the engine, while another drum of equal diameter carries the fall-rope which hoists the rock and ore out of the pit. As the engines are combined "link-motion" and "friction," the engineer can move his load horizontally or vertically at will. The other two cables are inclined, one end being anchored in the footwall about 100 feet from the surface and the other, after passing over a tower, on the bank. In this system the movement of the trolley in its descent is regulated by a stop-block, the location of which on the cable is controlled through a tail-rope by the engineer, one drum being made to raise the load vertically out of the pit and along the incline cable to the surface.



METHOD OF MOVING ROCK AND ORE FROM OPEN WORKINGS.

To save time and handling, the car bodies are lifted from the trucks, lowered into the pit, and exchanged for loaded ones, which are hoisted to the surface, lowered upon the trucks, and run out to the dumps by horses. In this way 1000 tons of material have been handled every ten hours. To expedite the work of loading the car bodies, light auxiliary cables are used, by means of which pieces of rock too large for the men to lift are readily hoisted into the bodies, while the main cables are kept busily employed in removing those already loaded.



TRANSVERSE SECTION OF ST. JOSEPH ORE-DRESSING WORKS.

IRON AND STEEL WORKERS.—At a late meeting of iron and steel-workers held at Metropolitan hall, steps were taken toward the organization of a trades union. The movement involves some of the employes of the Pacific Rolling-Mills of this city and the Judson Rolling-Mills, Emeryville, Alameda county, and the permanent organization is expected to start out with at least 250 members.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Mines in Sierra County.

At Sierra City.

EDITORS PRESS:—The Sierra Buttes mine, after 30 years or more of very profitable work, employing most of the time several hundred men, has recently discharged most of its force. It is hoped that better prospects or the purchase of some of the neighboring claims may soon encourage the company to increase their force and again utilize their splendid milling plant.

The Young America continues in vigorous operation and is regarded as a solid and permanent enterprise. A large force of men are working in the several levels. The scenery, with its variety of beautiful lakes, frowning cliffs and green forests, is something to be remembered for a lifetime. The bearing of the superintendent will be long remembered. He has a great reputation as a successful mining man, but this happened to be one of his "off days," when he was out of sorts with everybody.

The Saddle Back is just being prospected, and is exciting great interest. Mr. J. Rice crushed five tons of rock from this mine at the Kentucky mill. We formed his acquaintance, and found him very thoroughly posted on mining matters. He said the rock yielded $60 per ton. As we notice that he has since taken the contract to sink 100 feet of shaft on the property, taking his pay in stock, it looks as though those who had a good chance to know had faith in the mine.

The Marguerite mine has considerable water to contend with in the shaft, but has a Knight's water engine in operation, of which the superintendent speaks in very high terms, and says he knows of nothing else that would raise half the water with the same power.

All along down the stream to Downieville more or less work is being done. The Keystone mine has been very productive, and Mr. Mead thinks that by utilizing through electric transmission the immense water-power they can command, the mine can be very profitably reopened.

Downieville

Remains by far the most thriving town in the county. As headquarters for supplies and county seat it has great advantages, and then nearly all its citizens are interested in mines scattered all through the mountains.

Eureka North

Once polled 700 votes; now it is almost deserted. Yet, bad as it looks, one claim cleaned up about one hundred pounds of gold last spring. We have heard of almost all sorts of condensing plants, but here they have something new in the way of enterprise. Mr. Thomas has gone into house condensing. He took the best of the material from six houses and put it all into one, making a very comfortable home.

Port Wine

Is beginning to revive again since the opening of that splendid drift mine at Happy Hollow. Here W. S. Chapman and a syndicate of English capitalists have run a tunnel into the old river channel and are putting up substantial improvements as though they had come to stay. The bookkeeper informs us that the dirt is cleaning up $5 per ton and costing 75 cents per ton to mine and wash. As the supply of this channel is immense, the people of that vicinity are anticipating a long era of prosperity. They propose to increase the force to 100 men for the winter. Another sign of revival is that the gamblers are beginning to make weekly visits to collect their *dividends*.

Scales

Was once a prosperous camp but now in mourning. Their quartz-gravel reaches to the surface and pays well for washing, but not for drifting. For miles their claims extend up toward La Porte and past Poverty Hill. Millions are in them, but under the present construction of the anti-debris law the citizens hardly know which way to turn from starvation. When a man has mined for thirty or forty years he seems to be very certain that he cannot do anything else. Mr. J. V. Bean, who is a mining man of great experience and referred to as authority in that section, says it is perfectly practical to impound their tailings so that they can never reach a point to do any damage.

At La Porte

The town seems resting "between hay and grass," as the old saying is—too late for the old mines, too early for the new. There is some prospecting going on and a few large enterprises. Among these is "The Clay-bank," where a heavy Eastern company is running a very extensive tunnel to open a drift mine.

At Gibsonville

Things are looking a little brighter. A Scotch syndicate has let a contract for sinking 500 feet of shaft on grounds about two miles from the town. Contractors are to receive $27,500 for shaft and machinery. The latter is already on the ground and nearly in place. They are rapidly housing in the works and will employ twenty to twenty-five men this winter. The drill showed seventy feet of gravel above the bed-rock, which is 497 feet from the surface. Buckeye mine is also reported in a prosperous condition.

Whisky Diggings

Used to be a lively camp and traces of heavy work are to be seen everywhere.

At Potosi

The Virginia and Lincoln companies are running in a tunnel and are now fitting up the works at the mouth for a good winter's work. It is composed of practical miners, who are putting in their own time and who have faith in the prospect, but have experienced much trouble arising from the *public spirited* (!) efforts of that class who enjoy sitting around barroom stores claiming superior wisdom by running down enterprises of the more industrious.

Howland Flat

Was once the liveliest of mountain camps and headquarters for snow-shoe racing. For a week at a time every house in the town has been crowded with eager sporting-men as only Western hospitality knows how to crowd a house. Now the hydraulics are abandoned and there is only a little drift mining going on. Mr. Cox is running a tunnel for a French company just below the town. He seems to have little faith in any system of mining except hydraulics.

At Poker Flat

Are many small claims being worked by companies of one, two or three men. If local reports are true, the ground has been phenomenally rich. The hotel-keeper, who has been long in that section, pointed out one miner who had drank "a thousand barrels of whisky." As this had been bought at retail over the bar, the money paid represents a princely fortune. Then to think that one man should have leisure enough to dig that money from the earth after all the hard work and long hours required to drink the amount.

At Goodyear's Bar

There is some work going on along the streams and things have a comfortable look, considering the general depression.

Forest City.

The Bald Mountain mine had been the main dependence of the place for many long years. Since that has been abandoned many have left town and the pressure to sell sometimes becomes desperate. One lady who wanted to join her husband lately sold quite a comfortable little house with lot, furniture and all, for $40. Now talk about your boom prices in California! The house was fairly located and one that would ordinarily rent at $10 to $12 per month.

Bald Mountain Extension

Is being opened by a company composed largely of Downieville people and has very favorable indications. For the last hundred feet their tunnel has been running through swelling bedrock. Citizens are expecting to hear that they have struck the lead at any day. Should anything like the old mine be discovered, Forest City property would go up like a rocket. At the Forest House they have a specimen from the old mine about the size of a man's fist that is supposed to contain $200 worth of gold.

Big Strikes.

Since giving up hydraulics, people at Allegheny have been prospecting for drift diggings and quartz. Half a mile south from the town, through a very rugged canyon, flows Kanaka creek. This was very rich in early days and people have always thought there was a good quartz lead somewhere.

The Mariposa Mine.

Thirty years ago a tunnel was started on the south fork of this creek just above the junction. One company after another got tired. The last crowd gave up work in '81 after having driven the lower tunnel in some 180 feet. In October, '88, along came Grant and Apple, two practical miners, who had worked all over the coast in all kinds of mines, and, thinking like the rest that something must be there somewhere, threw off their coats and began work. They had a placer claim and another quartz claim, where they worked. They have only hired one man. On this claim it is said that one or two men have been working the past year. After going 15 feet they struck rock in January, '89, that yielded $10,000. Again in August, '89, they struck another $10,000, and on Oct. 31, '89, they took out from 1000 pounds of quartz 105 pounds of gold dust. Returns from the mint have given them a little over $17 per ounce net at the mine for the dust already shipped. Here have been $41,000 realized for less than 500 days' work. Mr. Apple informed your correspondent that he thought his neighbor, John Fessner, whose claim is a little higher up the creek, was doing equally well.

The latter gentleman is noted for reticence. Upon going into the mine your correspondent was not surprised that so many companies should have faltered. The country rock is gneiss and anything but nice to work. Here and there you find a very thin vein of quartz running a few feet, but no gold for almost 200 feet. Finally a talc footwall begins to raise until it strikes a quartz vein about 16 inches thick lying in two seams. In the lower seam they found this hard white quartz, just about enough to fill a good cask or half a car. Mr. Apple saved a specimen weighing 12 pounds that probably has more than $1000 worth of bullion. He means to crush it after showing to a few more of his friends. The Board of Trade ought to have it for their car. Such a piece of rock we never saw and never expect to see again.

Between this talc dyke and the ledge is a conglomerate that looks as though the cooks that mixed the rocks had made a Thanksgiving mince pie and put in everything good. Among them are greenstone, slate, gneiss and talc.

They are now running an air shaft up the ledge at an angle of about 45°. Mr. Apple says they may strike it again the next blow of the pick and may never. He was a machinist before he began to mine, and his partner is the millwright who built the Treadwell mill in Alaska.

The method of treatment is to roast the rock at a little higher than cherry-red heat for six hours. Then they crush it with a little hand-crusher made by Taylor of San Francisco. The work sounds like a boy eating soda crackers. The sand is quite fine, but has been laid away to be worked over again for more gold at some future time.

FRANK S. CHAPIN.

The Proposed Mining Law.

EDITORS PRESS:—Apropos of the proposed new mining law presented by Senator Stewart of Nevada, the questions presented by your correspondent, Mr. Brown, some little time since (issue of Sept. 7th), have considerable force. If a portion of the public domain, being mineral land, after appropriation under the mineral laws, has become again vacant and unappropriated public domain, there is, I conceive, no practical reason for any further limitations upon the right of location, then applied to its original appropriation. The limitation of the right of relocation proposed by Senator Stewart, if intended by him to prevent the monopoly of mining ground by persons unable or unwilling to develop their claims. I am disposed in agreement with Mr. Brown to hold that in actual practice the restriction would have an effect directly opposite to that intended.

However, discussion upon the several points involved in the Stewart bill is desirable. The interests involved are too important to be committed to the uncontrolled disposition of a single man, even if he be a statesman as enlightened and devoted to the interests of the Pacific Coast as Senator Stewart undoubtedly is. Nor is there any question but that Senator Stewart will very cheerfully adopt amendments and corrections recommended to him by a concensus of mining opinion. No changes of moment in the mining laws should be lightly made. No one familiar with the history of mining law and mining litigation is ignorant of the uncertainties surrounding the subject until very recent times. Owing to the magnitude of the interests involved, mining suits have commonly gone to the court of last resort. Questions arising out of the crudities of original legislation have remained open ones until settled by the judgments of the Supreme Court of the United States.

The construction of portions of the Acts of Congress of 1866 and 1872 has remained in doubt until comparatively recent years, and it is not too much to say that, in some respects, remains still in doubt.

No lawyer needs to be reminded that after the Legislature has acted we rarely know what the law actually is until, as one has irreverently remarked, "the Supreme Court has had its guess upon it."

Now, while it is undoubtedly true that our original legislation relating to mines and mining might have been improved upon, we have, at all events, reached the point where we know substantially what the rule of law actually is as construed by a tribunal, the conclusions of which are binding upon all.

This is an advantage not to be lightly lost.

Hasty or inconsiderate legislation will certainly throw us back into the very condition of doubt and uncertainty from which we have so recently escaped.

Amendment of the mining laws is perhaps desirable, but what are desirable amendments may be open questions. Amendments should, whenever possible, be in harmony with existing constructions.

A free discussion of the various features of the Stewart bill and of the general subject; a discussion in which both practical miners and lawyers of experience in the project join, will certainly have the effect of enlightening not only the distinguished gentleman from Nevada, but many of those who might participate in the discussion. I know of no place so fit for such discussion as your columns. My own experience in mining law and litigation has been confined (in this country) to nine years' past in New Mexico and Arizona. I can perhaps contribute little to the general stock of experience and learning upon which such a discussion should draw, but such as I have, I shall be glad to throw into the common stock.

D. J. M. A. JEWETT.

White Oaks, New Mexico.

A Black Sand Lode.

EDITORS PRESS:—In accordance with the promise made your readers several months ago, I visited the so-called black sand lode, on Rattlesnake creek in Tulare county, and will give you the result of my observations.

The so-called lode trends to the northward, parallel with and west or southwest of the pudding-stone slate described in a previous letter. Southwest of the lode is a formation of plumbaginous rock, very hard in its outcrop, but soft enough below the water line to soil the hands a glistening black. Between this plumbago and the lode there is occasionally some barren quartz or quartz carrying a trace of gold. The gold-bearing rock closely resembles mica-slate, when viewed at a distance of ten feet. But a close inspection of the cross-fracture discloses the structure of sandstone alternating in yellowish and black layers. It looks hard enough, but when a lump the size of a hen's egg is given a sharp squeeze in the hand, it looks like so much fine sand from the ocean beach. If this sand is tested in the horn-spoon it will show a high percentage of black sand, and behind the black sand there will be a trail a half-inch in length of very fine and very bright gold. Occasionally a piece the size of a small mustard-seed is met with, but this is a rare occurrence. The gold-bearing rock is four or five feet wide, and merges into something like talcose slate in the hanging-wall, and this in turn into the pudding-stone, a few feet farther to the northeast.

There are several belts of this pudding-stone—two at least, and it might suit the convenience of the young geological student to regard them as parts of one antediluvial curve; but the little time I had to devote to the question tended to convince me that they were probably parts of two distinct eras of formation. The hard black rock from the plumbago outcrop has a very uniform texture, and becomes waxy at about the temperature of melted cast iron.

I look upon the formation as worthy the attention of geologists, and as probably without a representative among the older rocks.

Kernville, Cal. STEPHEN BARTON.

Power Transmission.

EDITORS PRESS:—Your article relating to the Sutro Tunnel on page 342 of issue of Nov. 2, 1889, would indicate that both electric and wire cable transmission are now "blooming successes" on the Comstock. When your correspondent was there in September the best information he could get convinced him that electric transmission was still an experiment at the Chollar. He saw very fine machinery, but it was explained that certain obstacles arising from condition of the atmosphere in the lower levels were yet to be overcome before a satisfactory percentage of power could be transmitted.

At the C. & C. shaft the very costly wire cable transmission was in a state of "innocuous desuetude" and was represented as a cause of profuse profanity on the part of those who "put up" for it.

Reasoning from cost of fuel for steam-power at Virginia City, the success of water works already in operation, the immense power required to work the mines and mill the ore on the Comstock, it would seem practical to largely increase the proportion of work done by water-power, even if water was to be brought from Tahoe to furnish power to raise the ore from the lower levels to the tunnel and to drain those levels. Then let the ore be sent to the mouth of the tunnel and the water-power there be put to its best use in milling.

F. S CHAPIN.

DRIFT MINING.—The Mayflower Drift and Gravel Mining Co., Forest Hill, Placer county, is making money. On Oct. 1, 1888, the tunnel was completed 5585 feet, and the first two upraises were made. The mill was completed Dec. 11th, and on that date the first car of gravel was dumped into the mill chute. From Dec. 11, 1888, to Sept. 24, 1889 (the date of the last cleanup), the amount of gravel taken out and crushed was 33,787 tons, rich and poor, with a return of $272,616.56, or an average of $8.06 a ton. Since December 1888, they have worked out 1620 feet of channel, 860 feet north, and 760 feet south. These 1620 feet of channel have produced $272,616 50, and that amount represents about the same average per running foot as in that part of the mine worked through the main prospecting shaft in 1885. The Mayflower Consolidated Company, including the Orono groups, has yet 25,820 linear feet of channel to work, without mentioning the gravel of the raises and the upper channel, known as the Paragon lead, which has been found in the old mine; also the gravel of the Orono claims worked.

A FEAT OF PHOTOGRAPHY.—One of the most remarkable feats of photography on record is the photographing the terrible explosion at Antwerp, or, if not the explosion, the immense cloud of smoke produced at the moment. The current number of *La Nature* gives an illustration copied from a photograph of the huge cloud that shot up in the air, roughly in shape like an inverted Florence flask, when the explosion occurred. It has been estimated as being 1700 or 1800 feet across, and, according to the journal quoted, the cloud remained motionless for about a quarter of an hour, preserving the form recorded by the photograph. A nearby camera by chance happened to be turned in the direction of the explosion just as it occurred, hence the picture.

CONCENTRATING.—A contract has been entered into between the Grand Prize and Commonwealth Companies of Tuscarora, whereby the Commonwealth Company is to have the former's concentrators at the rate of $3.25 per ton of ore worked, provided the Grand Prize Company performs the work, or $1 per ton if the Commonwealth does the work and assumes the responsibility.

Artesian Wells in California—No. 3.

[By C. E. GRUNSKY, C. E.

(Concluded from last issue.)

Interest in boring for gas was renewed when Cutler Salmon's well was completed in 1883. This well is about seven miles southeast of Stockton. The valley at that point is only about 15 feet higher than the natural ground at the Stockton Court-House. Water was struck at 844 feet, with a seven-inch casing. Its pressure is sufficient to cause it to rise 14 feet above the ground's surface. Its quality is good. Though the boring was thus crowned with success, it was decided to explore greater depths. A four-inch core was inserted in the seven-inch casing, and with a four-inch diameter the well was sunk to 1250 feet. Here again artesian water was struck, and with it rise great quantities of inflammable gas.

Prof. Hilgard says: "The amount of mineral matter in this water—over 200 grains per gallon—is far too great to allow of its use for domestic or irrigating purposes, nor is there any method short of distillation by which the saline contents could be materially reduced."

This water steadily rising in large volume has a temperature of 80° F., and is now used for medicinal purposes. A bathing establishment has been recently fitted up, and its vicinity bids fair to become a sanitarium. The potable water which rises around the ou side of the four-inch tube is piped to the dwelling of Mr. Salmon for domestic use. The gas, which is mainly carbonic oxide and carburetted hydrogen, is used for cooking, heating and lighting the premises, while a large surplus is allowed to escape.

At the new waterworks in Stockton the gas rising with artesian water is utilized for lighting purposes. At the Crown Mills in Stockton an artesian well supplies water, light and fuel, at a saving to the Milling Company, it has been claimed, of over $200 per month.

The great gas-well of Stockton, however, is the one recently bored to a depth of somewhere near 2000 feet in the western part of the city. It is owned by a corporation, organized for the purpose of supplying gas for fuel and for light. This company contracts to supply gas at the rate of $1 per 1000 feet, and their mains are being laid throughout the streets of the city. Their well is 12 inches in diameter at the surface of the ground, and the first reduction of diameter was made at about 1000 feet below the surface.

The artesian well of 1883, at the Asylum for Insane at Stockton, also brings up gas at the rate of 36 cubic feet per hour, and other examples of gas-wells could be cited for the same vicinity.

Thus a fact has been established, which Stockton ought at once to take advantage of. Practically, the quantity of gas that she can cause to rise spontaneously from the bosom of the earth is unlimited, and well could Stockton afford to offer gas for light and fuel free to all manufacturing establishments that will make connection with a gas-main to be supplied from a system of city gas-wells, of which the successful gas-wells already bored should become members.

It has been suggested that possibly the gas in the water is the source of pressure which causes the water to rise. This is not the case. At the great depth from which the water rises under a hydrostatic pressure of 1000 to 2000 feet, the gas is a component part of the artesian water. It is pressed into solution, and is liberated when pressure is sufficiently reduced.

The first well in the Merced-county group of artesian wells was bored in 1869. It is known as the "Prophet Well." Much trouble was experienced by the well-borer, who was new at the business of boring for artesian water, but he did finally force his well-casing to 240 feet. From a water-bearing stratum of sand at that depth, water rose to the surface of the ground. The well borer conjectured that if leakage into dry sands and dry soil from the defective casing could be stopped, then water would flow above the surface. He poured some corn-meal into the well, which found its way into seams and decreased leakage. The water commenced to flow over the top of the casing, and the well was accepted by owners of adjoining farms as a success.

Over 100 others have since that time been bored near the central part of San Joaquin valley, in Stanislaus, Merced and Fresno counties. These are all located near the trough of the valley. Most of them are less than 400 feet in depth—while beyond the eastern limit of the district, as at Borden and Modesto, borings of 1000 feet failed to secure the much-desired spontaneous flow of water.

A small amount of gas, barely sufficient for one small jet, rises from a well about two miles south of Merced. This well is near the eastern limit of the artesian district, and is 600 feet in depth. Its water rises from a stratum lying far beneath those drawn upon by the other wells in the district.

Water from the well at Chester, Dickerson's Ferry, on San Joaquin river, has a decidedly saline flavor, and cannot be used for irrigation. Important medicinal properties have been claimed for it by a Merced physician.

The well of E. Asbury, on San Joaquin river, several miles above the well last named, had a large flow, but its water was so strongly impregnated with salts of various kinds, that it could not be used for domestic purposes nor for irrigation. The well has been permanently closed. Other wells in the district supply water of excellent quality.

I have already referred to the wells in Tulare county. These lie between Tulare lake and a line about midway between the lake and the base of the Sierra Nevada foothills. There were 100 wells in this district in 1884, and their number has been steadily increasing. Their depth is generally 400 to 600 feet, and their water-supply is drawn from a series of layers of sand, which are closely confined between clays. Water is uniformly good in quality. It has frequently the disagreeable odor and sweetish taste caused by sulphuretted hydrogen, which is lost after a short exposure to the air.

The characteristic of the Tulare county artesian-well district to which I desire to call particular attention is that here better than in any other part of this valley the records of stratification indicate the continuity of the clays which serve as water-caps and water-beds. From beneath a stratum of blue clay at Tulare, water rises to within seven feet of the surface. It barely comes to the surface from beneath the same clay two miles west of Tulare, but flows copiously at any point farther west at which a bore-hole opens a vent.

The hydrostatic pressure under which water flows beneath this clay and beneath other deeper-lying clays is not great; and here again, as this lack of pressure indicates, the upper or eastern limit of the artesian district is but part way up the eastern plain of San Joaquin valley. In two wells at Visalia 600 and 700 feet in depth no artesian water was found. Another well 700 feet deep several miles northwest of Visalia was bored with a similar unsatisfactory result.

About seven miles northwest of Visalia a boring in the low land adjacent to Kaweah river struck artesian water in very small quantity at 500 and 700 feet. The water rises from beneath a hard cement material. The stratification was not at all analogous to that found on the plain away from the river.

Famous throughout this State, and justly so, are the magnificent wells near the southeastern shore of Tulare lake. These are in the lower or northwestern portion of the Kern county well group, and their source of supply is in the irrigated district of Kern river and probably to some extent along the base of the hills where waters from Poso creek, White river and Deer creek sink.

Among the wells of this group is one of which it is said that its water, rising from a single water-bearing stratum at a depth of 415 feet, spouts water 54 inches above the top of the well-casing which has an inside diameter of five and five-eighths inches. Its flow is about 2,000,000 gallons per 24 hours. In 1886 there were, within two to 12 miles of this well, 27 others, all flowing copiously.

It is needless to say that much of the water thus brought to the surface is used for irrigation purposes. An artesian well of good flow supplies water enough to irrigate from 40 to 200 acres of land.

It is instructive to note, also, that the combined flow of 100 artesian wells of the Tulare county group in 1884 was 30 cubic feet of water per second (1500 miners' inches under a four-inch pressure), and that this water was made available by an expenditure of about $100,000. In other words, the cost per cubic foot of water per second thus made available was $3300, or at the rate of $67 per miners' inch.

When the strongly flowing wells near Alviso in the lower end of Santa Clara valley were opened, it was found that the flow of the wells near San Jose commenced to decrease, and some ceased to flow altogether. Laws were passed to make it incumbent upon owners of artesian wells to check their flow when water was not being used, and on Nov. 29, 1886, Judge Belden in San Jose, in his charge to the Grand Jury, referred to this law as one intended to prevent waste of artesian waters, requiring that wells be capped and defining waste.

Most of the wells in Santa Clara valley have a diameter of seven inches. They are generally from 250 to 500 feet in depth, and the artesian water rises from one or more of the many layers of sand or gravel which there as elsewhere are found between extensive beds of clay.

These wells show a very direct connection with their source of supply, which again lies at the valley's edges.

Thus we read in the San Jose *Mercury* of April 12, 1884, that the artesian wells in the eastern part of the valley are increasing every day; that, in fact, wells which had gone dry and in which water sank to several feet below the surface were again running good streams. The well at the residence of J. Lee on Santa Clara street is referred to as an example of a well which has commenced to flow again. The view is there expressed that recent rains are the cause of the increased flow, and it is hoped that if the wells at Alviso be capped all the other wells will maintain their flow.

Near San Francisco bay many borings have been made which yield small supplies of artesian water. At Dumbarton Point, Alameda county, in August, 1878, a well was bored from the top of a wharf which projects into the bay. It was made 212 feet deep from the top of the wharf, which is ten feet higher than the bay's water-surface. This well discharges a stream of good drinking-water two feet above the wharf.

At San Mateo in 1879 a flow was struck under yellow clay in coarse gravel over which lies a layer of fine beach-sand. The gravel was found at a depth of about 140 feet.

The salt-marsh wells near San Mateo are well known. They are generally but little over 100 feet in depth. Water rises from beneath a stratum of clay. Some of these wells can be cited as examples of artesian flow influenced by the tides in the bay. This phenomenon, which has been noted also for a well 180 feet deep on the Alameda side of the bay, near Mount Eden creek, and for one on the marsh-lands of Mare island, is due to the fact that the clay water-cap is elastic and not everywhere firmly supported from below. It presses with unequal force upon the water beneath it, according to the stage of the water in the bay, and thereby directly influences to some extent, not exceeding the rise and fall of the tide, the hydrostatic pressure in the water bearing stratum from which the artesian wells above cited draw their supplies.

The artesian well of W. H. Sears at Mayfield runs a ram which pumps water for house use. It supplies water for irrigation, and the waste flows into a large pond stocked with fish.

San Francisco has a few flowing wells, all of slight depth. Most borings in San Francisco, which are usually, though improperly, termed artesian wells, are borings from which there is no spontaneous flow, from which water can only be secured by pumping.

Artesian water is found in many of the small mountain-valleys of California. In Scotts valley at a depth of about 80 feet; near Upper Lake at about 50 feet; near Igo, Shasta county, at 20 feet.

In Sierra valley there are now nearly 200 wells, ranging in depth from 200 to 1000 feet. Most of these are cased to a depth of only 20 to 40 feet from the surface. The casing in use is ordinary gaspipe, two, three or four inches in diameter. It is claimed that the flow of these wells is influenced, to some extent, by the seasons, and that in a few instances the opening of new wells has reduced the flow of one or more neighboring wells. Most of the wells of Sierra valley have but a weak flow. The amount of water which each supplies ranges from about 4000 to 130,000 gallons per 24 hours. The aggregate flow of 26 wells, bored in 1886 by the West-side Well-boring Company, in this valley, was reported at 756,520 gallons per 24 hours, or an average of 29,000 gallons a day.

The warmest water reported from any well in Sierra valley in 1886 had a temperature of 190 degrees.

Although the first artesian well in that valley was bored as early as 1863 or 1864, the systematic development of the artesian supply did not commence until about 1883.

At Bieber, Lassen county, hot water was struck at 250 feet, several years ago.

At some points along the Pacific Coast, on the slope toward the ocean, flowing water has rewarded explorations made with the auger.

Artesian wells are numerous near Santa Barbara. There was one within four miles of Guadaloupe only 78 feet in depth, completed in October, 1879.

Even the deserts of California are blessed with artesian water. There are a few wells of moderate flow on the Mojave desert; and there is one farther south, at Indio, in San Bernardino county, at a point where the surface of the desert is below the level of the sea.

Whenever the water-bearing strata of any artesian district crop out at the surface at an elevation less than the points at which water enters them, at a low point of the rim of the clay or rock water-bed, then water received by them in excess of saturation will ooze out of the ground. Cienegas are formed; sometimes springs. Many such cienegas have become fruitful sources of water supply in Los Angeles and San Bernardino counties, and their development as a source of water supply still continues. Very few reliable facts concerning the amount of water which they can be made to yield have as yet become available. It must, however, be presumed that their yield cannot be increased indefinitely, and that here, as elsewhere, an interdependence of wells exists, even where the same cannot readily be detected.

Speaking of the Victoria Cienega, which is about three miles northeast of San Bernardino and in which Mr. Matthew Gage of Riverside has undertaken the development of water by means of artesian wells, Prof. E. W. Hilgard says: "This water-tract is, in reality, merely an extensive (540 acres) tract of cienega land, lying almost entirely within the first bottom of Santa Ana river, here bordered by steep bluffs of alluvial deposits from 15 to 30 feet high.

"In the borings made on the water-tract there was usually penetrated from 20 to 50 feet of alluvial soil and sand, the latter gradually increasing in coarseness downward and bearing more and more and larger gravel, until, at the depth of 90 to 100 feet, the material was largely cobbles of considerable size, rendering boring very difficult, and at times, when a vigorous flow of water was struck, resulting in the forcible ejection of stones almost filling the seven-inch pipe. It being found very difficult to reach any considerable depth with so small diameter of pipe, the ten-inch bore-hole has now been adopted as the regular size on these lands.

"It has been noticed that the size of the cobbles decreases toward the sides of the valley, where greater depths are easily reached, while here 211 feet is the greatest depth attained with a ten-inch bore, and most of the good wells range from about 150 upward.

"The interspaces between the cobbles are everywhere filled with sand and gravel; and the water-bearing gravel-beds alternate with more or less impervious beds of clayey material, or hardpan, at intervals varying from a few to 15 and more feet. As each additional layer of impervious material is penetrated by the auger, the rise of water is more energetic and copious. But the gravel-beds continue to the lowest depths reached; and according to the usual rule, they probably fill the depths of the valley to bedrock."

The wells in the Victoria Cienega, as reported by Prof. Hilgard, had a combined flow of 1091 miners' inches 36 hours after all had been uncapped and had been running their full streams. At the time of this measurement, in April, 1889, 27 wells were flowing. They were bored in four groups. From Prof. Hilgard's account of these wells I have made the following notes:

"The extent to which the discharge of any well or group of wells is influenced by that of others situated at a greater or less distance is a question of great practical interest, since upon the answer depends the aggregate amount of water to be expected from the further development by the boring of additional wells."

He finds that in one group of six wells the shutting down of five wells aggregating a flow of 205 miners' inches (50 miners' inches equal one cubic foot per second) influences the flow of the sixth well to the extent of 18 per cent.

One well of another group which had been running steadily for more than a year (all the rest of the group, as well as those of two other groups, being closed) was discharging 61 miners' inches. After nine other wells of the same group were uncapped, this well was found to have decreased to a flow of 57 inches in the course of about three hours, and on opening a well within 80 feet of it, its flow suddenly fell to 55 inches, and 48 hours later it had reached its minimum flow of 48.4 inches, which, however, five hours afterward had risen again to 51 inches.

These experiments bear out what I have already said about the interdependence of artesian wells, but they were extended over too short periods of time to be made the basis of definite conclusions.

In speaking of the derivation of the water supply for the wells of the Victoria Cienega, Prof. Hilgard says: "What we now see happening during the rainy season at the mouths of the canyons has happened from time immemorial; the original depths of San Bernardino valley have been filled up within 20 or 30 feet of the present surface, with just such masses as we now find surrounding the mouths of the canyons, and this immense mass is filled with water, annually replenished during flood season by the absorption of

(Continued on page 400.)

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

AMADOR GOLD.—*Ledger*, Nov. 16: At the Amador gold mine everything points to the early resumption of work upon the 60-stamp mill, and its prosecution to completion. The tapping of the main west ledge at the depth of 550 feet, showing a fine looking ore body 20 and 30 feet wide, has stimulated getting the mill in shape for active operations. The Frue concentrators constitute the main item of expense in connection with the completion of the mill. There are to be 24 of these. A. P. Minear has returned from London, and reached Jackson this week. The new hoisting machinery works to perfection. It is a model of convenience and power, and gives entire satisfaction; an ore-bin has to be built at the shaft, and also the car track to the mill. Mr. Francis, the foreman, and a thorough practical miner, expresses the utmost confidence in the future of the property. The same ore-body struck at the 550 level was cut at the 250 level, but it was there found to be of a considerably lower grade, and this fact carries the gratifying information that the ledge shows a marked tendency to improve with depth. Another point equally clear is that the ledge is not of a pockety nature. It is low grade, variously estimated to yield from $4 to $5 per ton in free gold.

AT THE MANDICH quartz claim, now operated by Messrs. Pickett and Treadwell, they have been engaged in running a tunnel to tap the ledge at a point considerably below the old works. They have encountered some small seams of quartz, which were followed some distance, but led to nothing important. They are now supposed to be about 20 feet from the ore-body for which they are driving. The McKenzie mill at Irishtown has been running for the last two weeks, under the management of A. O. Wilcox.

AT THE KENNEDY mine, sinking is progressing at a satisfactory rate. A new station is being cut at the depth of 1150 feet. It is intended to open up two new levels by the present sinking.

Butte.

DRIFT AND QUARTZ MINES.—Oroville *Mercury*, Nov. 15: Col. A. P. Frary, the mining man, was seen last evening by a *Mercury* reporter. When asked about the mine in which he is interested, he admitted that the prospects for mining in Willet's Ravine are very bright. "I think," said the Colonel, "that I can say with assurance that we will be able to take out at our mine at least $20 to the pick, and when we get things running smoothly, perhaps more." This is truly a bonanza, but no one doubts the richness of the mines in Eastern Butte. In this same vicinity are the mines of Carr, Kennedy and Murphy; Bracken, Gregory & Doyle, and many others, all of which have proved very rich. Dave Reece has also struck a very promising quartz ledge which he intends to work for all there is in it. Col. Frary thinks that next season Ravine will be a very lively mining camp, and predicts big things in the shape of mining for this county. The one main drawback in these mines is, that they are so far up in the mountains that it is very difficult to work during the winter. But a revival of mining in Eastern Butte would make business lively and boom real estate, and a general prosperous condition would ensue.

Calaveras.

THE ANGELS MINE.—*Record*, Nov. 16: This mine, situated in the northwestern part of Angels, is the property of Mr. James V. Coleman of S. F. He acquired the mine some five years ago, when it had merely history and tradition to recommend it. The mine now has developed and enlarged until the ore bodies are not only of mammoth proportions, but rich in gold and sulphurets. All this and more is due to the management of Geo. Fox, the superintendent, who for four years last past has projected and systemized the plans of operation. The late work has been confined to the south shaft, familiarly known as the Potter shaft. Here the work of pumping water and repairing the old shaft has been under headway for some months, and a point between the 500 and 600 foot level has been reached. On the 300, 400 and 500 foot levels, have been found large and rich bodies of ore, more extensive and general than all of the quartz ever taken from this mine up to the present time. This is saying a great deal, for this mine has yielded in days gone by over $1,000,000. It is expected that the same system of intelligent crosscutting on the 600-foot level will show the same great results. The company will erect in a short time a large mill, and also chlorination works.

NEW MILL.—Amador *Ledger*, Nov. 16: W. T. Robinson is building a five-stamp mill at Sandy Bar, with line shaft for five more. The mine will be supplied with concentrators, self-feeders, and other improved appliances of the latest pattern. It is intended to run with free water-power from the Mokelumne river. The Sandy Bar Mining Co., we are informed, owns four quartz mines and two gravel claims.

THE DORPHINE.—*Chronicle*, Nov. 16: This mine is situated about two miles east of Jesus Maria and was first discovered in the early fifties. Some very rich specimens were taken out at that time. Some prospecting has been done on the mine by different parties, but not to any great extent until about two years ago, when a party from San Francisco purchased the mine and spent in the neighborhood of $2000 in prospecting work. The mine at present is owned by Mr. Wm. Caldwell of San Francisco, who, we have been informed, intends to put up a mill and work the mine on an extensive scale.

El Dorado.

SEAM CLAIM.—Georgetown *Gazette*, Nov. 16: McPherson & Austin, engaged in sluicing and running an open cut in their seam claim, adjoining the Crane's gulch mine on the north, are meeting with good success. Joe Swasey is getting ready to start up his seam mine on the south of Crane's gulch mine. Bill Reed continues to work the Rich gulch pocket mine. The Fredericks Bros. are about to start up their Buffalo Hill mine. Wilsey & Dains have started a new tunnel to work their seam mine to a greater depth. E. C. and Clifford Cheek continue developing work on the claim west of the Crane's gulch mine.

Inyo.

CERRO GORDO.—Inyo *Index*, Nov. 14: Of late years the great drawback to operations in Cerro Gordo has been the entire lack of water except as conveyed to town by pack trains. The new works of the Union M. Co. excel in every respect the old Los Angeles and Belshaw systems together. From the new hoisting works to the Belshaw, Crohn and Mexican springs, a distance of 5¼ miles, a pipe has been laid from town along the western face of the mountain. At some points a ditch had to be broken out of the solid rock, but most of the way through rocks and earth. All is covered two feet in depth. At the springs, on the eastern face of the mountain, three 5000-gallon tanks are placed to collect the water, which is pumped over a divide 365 feet above, where the water reaches a point 600 feet higher than the town. The daily delivery will be 3000 gallons, sufficient for all ordinary purposes. The steam pump will necessarily run only one day in the week to fill the receiving tanks at the works. The new system is a credit to the ability of Wm. Crapo, the surveyor and engineer.

LOOKOUT.—Cor. *Index*, Nov. 8: From October 15th to date, Frank Fitzgerald, lessee Modoc Con. M. Co. has made the following shipments to San Francisco: Ore concentrates, 22,000 lbs; furnace concentrates, 24,300 lbs; ore, 21,000 lbs. Mr. Fitzgerald has leased the furnace dumps to Lambert, Lozano & Elias for six months, dating from October 28th. They are averaging 900 pounds of pay slag and 60 pounds of clean bullion per day. At present 6 miners, 2 laborers, 1 cook, and 1 packer are employed, which force will be increased to 15 men the present month.

ORE SHIPMENT.—The Erin mine will this week ship five tons of ore to Selby & Co., San Francisco, for reduction.

A CARLOAD of ore from Poleta mines came down the road on Monday. It will be worked at the Maxim mill.

TUNNEL CONTRACT.—Messrs. Treglown & Wilmot have been awarded a contract by the Lone Pine M. Co. to extend the tunnel in the San Carlos mine 50 feet.

Los Angeles.

THAT STRIKE.—*Times-Index*, Nov. 15: It appears that the ledge of silver ore that was found early last week in the San Gabriel canyon is likely to realize the expectations which were formed at that time. Recent reports show that the strike is holding out and that very likely it extends downward a considerable distance. Some years ago a tunnel was sent in from the side of the hill and a rich body of silver ore was struck. The gentleman who owned the mine thought he would sell it, and it was at the beginning of the land boom and he thought he could make money faster in land. He took samples East, and at one time nearly effected a sale at a good figure. Then came a heavy storm, and the tunnel, which was not properly braced, caved in. Since then two attempts have been made to strike the ore by parallel tunnels, but beyond an average pay rock, nothing extraordinary was found until early last week, when the superintendent of the mining company owning the mine stumbled across the surface cropping of what appeared to be the same ledge as that found in the caved tunnel. The superintendent had climbed the side of the mountain above the old tunnel and was not looking for anything in particular, when in the midst of the brush he caught sight of the outcropping of the ledge, and broke some of it off for testing. The first sample sent to the city assayed $390 per ton and the next $1549 per ton, and then came the samples from the rich streak, which assayed $7260 per ton and $10,012 per ton. This streak is from 12 to 18 inches thick.

Mariposa.

AROUND COULTERVILLE.—Cor. Mariposa *Gazette*, Nov. 16: Mr. Francisco Bruschi has purchased the five-stamp quartz mill at the Martin and Walling mine, and has a gang of men up there taking the mill down and preparing it for removal to Bruschi's famous quartz mine on Indian creek, about eight miles from Coulterville. Mr. Bruschi has a force of men clearing off and leveling the mill site. So in a few weeks we will hear the delightful music of stamps on Indian creek. Mr. Williams, of S. F., is running a tunnel across the main mother lode near Pino Blanco. He has struck a body of splendid looking ore, near the foot-wall of the vein. The Bondurant mine is still running.

Mono.

MONO.—The crosscut 2 from south drift, 1000-foot level, was advanced 19 feet. East crosscut from south drift was driven 32 feet.

BODIE.—The south drift, 900-foot level, was advanced 13 feet. Upraise No. 11 from south drift, 1000-foot level, was extended 7 feet. Upraise No. 2 from south drift was driven 19 feet. East crosscut from shaft, same level, was advanced 34 feet.

BULWER.—During the past week the north drift from the top of No. 5 raise was advanced 41 feet; total length, 131 feet. We are now starting a crosscut east from face of drift.

Nevada.

THE COE.—*Transcript*, Nov. 9: The tributers who are working the Coe mine above water level are getting out some good ore. Mr. Craig, who obtained a bond on it nearly a year ago and has been prospecting the lower levels with a view to purchasing if the results were favorable, has not been heard from for a long time. In fact, but three remittances have been received from him since last January. The miners on day's pay quit several days ago. The cars have been taken away, and now the water is rising in the shaft. Practical miners who know about the Coe speak of it as a fine property, and say that with the right kind of management they are sure it could be made a dividend-payer. It ought not to suffer for good management with as many experienced and capable mining men as there are in Nevada county.

PUSHING WORK.—*Transcript*, Nov. 15: Alf. Tregidgo, the well-known superintendent, came down Thursday from Ormonde. The various mining enterprises under Mr. Tregidgo's management are being prosecuted with vigor. The 20-stamp mill at the Washington of Ormonde has been started up and will hereafter run regularly. It has been fitted out with all the best of modern appliances, including concentrators invented by the superintendent, and which have been proved by practical tests to be most effective sulphuret-savers. The shaft is being sunk for the 500 level and has a fine 3½-foot ledge in the bottom. The pay chute in the 300 level has been opened and found to extend 700 feet. It is estimated that there is between 20,000 and 30,000 tons of pay quartz in sight. At the Bluebell, near Ormonde, the work of sinking for the 400-level is being prosecuted. The ledge in this mine is very large and the ore of high grade. The water is being pumped as rapidly as possible from the Peabody at Grass Valley, and this promising mine will before long give employment to a large force of men.

THE CENTENNIAL.—The new tunnel at the Centennial drift mine near the Central House is in 40 feet. It has been run at the rate of three feet a day, the miners getting out the timbers they use.

PEABODY MINE.—Grass Valley *Union*, Nov. 16: The improvements at the Peabody mine are about completed, but the starting up of underground work has met with an unexpected delay on account of the matter of the right of way for water to use as power at the mine. The water that is furnished from the South Yuba reservoir has to pass through several residence lots in town, and some of the owners object to the water passing through their premises, while others have granted the right of way.

RICH SPECIMENS. — Superintendent Stoddart brought up a lot of handsome quartz specimens from the Hartery mine yesterday, taken from the No. 2 level, from what is known as the Bays shoot. All of the pieces showed a liberal amount of free gold, and some of them were heavy with the precious metal. The quality of the rock was good milling independent of its specimen character, containing gold-bearing sulphurets. The Hartery is already showing up well, although the water has only been out of the mine a couple of weeks after standing idle for years.

PROGRESS AND DEVELOPMENT.—Nevada *Transcript*, Nov. 17: McCoy & Co. are meeting with excellent success in developing the new ledge recently uncovered by them in the Nevada City mine. It is from one to two feet in thickness and shows well in free gold and sulphurets. Careful estimates indicate that it will pay from $20 to $30 a ton. This is now demonstrated to be a true contact vein, having a granite wall on one side and slate on the other, and as it has never been worked below water level there is a reasonable prospect of developing a rich pay chute entirely independent of any heretofore discovered in the mine. The shaft of the Hudson quartz mine on Deer creek below Newtown, has been put in good condition down to water level. The pump will now be started up and when the shaft is dry sinking will be resumed. The superintendent says there is a good prospect for a mine there, and if he "strikes it rich" work will begin on a number of other ledges in the same district. The Delhi Co. are about to run a tunnel in their claim near Columbia Hill, from a point in the canyon about 50 feet above the river, and this will give them a third level and good drainage. A compressor, pipe, etc., to be used in doing this work are daily expected here. The St. Gothard Co. (stockholders in the Champion mine) will next spring erect a mill on their claim in Columbia Hill district. At the El Dorado mine in the same part of the county, good ore continues to come out. The work of clearing away the debris occasioned by the cave that occurred October 6th at the Manzanita drift mines, is being pushed ahead as speedily as the water obtainable makes possible. It is expected that the mouth of the new tunnel will be uncovered by the end of this month. Twelve prospectors are working in the vicinity of the Half Mile House, just south of town, and some of them are getting good returns. The Champion continues to prosper. The ledge is holding its bigness and richness. About 40 men are employed and the mill is running all the time. The tributers of the Gold Tunnel mine are still finding good ore. The Gray quartz mine on Piety hill continues to pan out well, and will do better when the present development work has proceeded further. The Ebaugh Bros. of Willow Valley on Friday last struck better ore than they have had for a long time, and there seems to be an abundance of it. The Montana recently had a crushing, and the cleanup was fair. Dean & Ragon are taking out another crushing. Lord & Co. at the Spanish will have all their machinery in readiness within a few weeks to begin grinding out gold.

THE DIAMOND CREEK.—*Tidings*, Nov. 16: "Wm. May, A. Shepherd and Wm. Morris returned Friday evening from the Diamond Creek (Eagle Bird) mine, situated a quarter of a mile above the town of Maybert, this county. The gentlemen named have in their absence from Grass Valley reconstructed an old 20-stamp mill on the mine and added ten stamps. Mr. Morris informs us that a long flume from the South Yuba river to the mine has been placed in thorough repair, entailing heavy expenditure and labor of the most arduous nature. Mr. May will return to the mine in a fortnight and superintend the erection of two air-compressors at a point nearly a quarter of a mile below the hoisting and reduction works. The mine is undoubtedly a fine piece of property. The ledge ranges from 4 to 16 feet in width and shows free gold and high-grade sulphurets. Four Burleigh drills supply the 30 stamps with ore. Holes for blasting purposes are put in 10 feet. In the mill the sulphurets-saving system introduced in this city by Messrs. Norton & Cobb, or a system similar, is used in preference to concentrators. About 50 men are at present employed by the company.

Placer.

PICK AND SHOVEL.—*Herald*, Nov. 16: McCaw and Curtis are meeting with great difficulty in cleaning out the old slope at the Bellevue. There is an immense quantity of water to handle, and caving of the walls adds to the trouble and expense. They keep at it, however, and will succeed. The hoisting machinery works admirably. The rock from the last blast in the Moore mine on Duncan Hill shows no falling off in richness, The R. E. Lee mine in the same hill shows very good indications. The shaft is down 25 feet. The quartz taken out looks so well that the owners are greatly encouraged and will sink deeper. The gravel carries considerable free gold. The Hogsback Co. have started a new tunnel 437 feet lower down the hillside than the first. T. B. Harper is running a bedrock tunnel in his claim at Sailor Canyon. He is in over 400 feet. Hartley has started his mill at the Almond mine. Seventeen men are employed.

Plumas.

THE DRURY.—Greenville *Bulletin*, Nov. 13: Standart & McGill are still busy extracting ore from the Drury mine. The force of men is not large, but it has been sufficient to keep 15 stamps of the Kettle mill running. During the past summer, a great deal of work has been done in the line of development. Mr. Standart has given the property close attention. The supply of water in the Round Valley reservoir is good, being about 13 feet deep at present.

THE INDIAN VALLEY MINE.—The water is nearly out of the Indian Valley shaft, and the other work is progressing well. Last week, a flat cable wire rope, 500 feet long, was placed in position. The wire is of the best quality of steel. The large air-compressor, one of the best on the coast, works to perfection. The mine is being opened up and now has a large quantity of good milling ore in sight.

Sierra.

ON THE RIDGE.—*Mountain Messenger*, Nov. 16: The Scotch company which is sinking a shaft on the ridge 2½ miles below Gibsonville, has got its engine and appliances set up, and will in a few days have everything under cover. They have been delayed somewhat on account of lumber, but the sawmill is now finished and at work. The shaft is near the old Goahead shaft, only farther back in the ridge. The old shaft was about 350 feet deep, and had no trouble with water until gravel was struck within about 15 feet of the bottom.

Trinity.

LOOKING WELL.—*Journal*, Nov. 16: Capt. Griffith of San Francisco, who, accompanied by W. R. Fowler, has spent the past week at Taylor's Flat examining the prospecting work done on the river-bed drained by the tunnel, and the other property in that neighborhood owned by the Lower Trinity Tunnel Co., passed through town Wednesday on his way home. He expressed himself as highly pleased with the results of the summer's work. The prospecting done has fully satisfied the company in regard to the richness of the river-bed, and next summer they will work it with a couple of elevators. The ground as far as prospected will pay from $8 to $40 to the hand shoveling in. The company also owns Taylor's Flat and will operate that property in another year. Not much can be done this year, as the claim needs considerable preparatory work. The ditch and flume need considerable repairing; the sawmill belonging to the property will be moved up French creek to a better location for timber. The company realize the fact that they have a good property, and next season will work it on an extensive scale, working the river-bed in the summer and the hydraulic claim on Taylor Flat in the winter.

Tuolumne.

IDLE MINERS.—Sonora *Independent*, Nov. 16: There are a great many idle miners around town at present. Many of them have been at work in the neighboring mines, and have saved a little money, sufficient to permit them to pocket-mine for awhile, if they could find a cabin to live in. But there is not a tenantless cabin to be had, and as they cannot afford to work on chances and pay hotel bills, they will be compelled to go elsewhere. Would it not be a good scheme for some one with a little ready money to build a few cabins to rent? It would surely be profitable to the builder, and a great benefit to the town, not only from the fact that their occupants would leave many a dollar with our business men, but would assist in developing our mineral resources.

LONGFELLOW.—*Union-Democrat*, Nov. 16: Col. Root is the sole owner of the Longfellow pocket mine, two miles this side of Groveland, and is largely interested in the Alameda mine at Rawhide. A mint of gold has been extracted from the Longfellow mine in years past, and the present outlook indicates that a big bonanza is deposited somewhere. A force of nine men has been employed for the past year, and sufficient gold has been taken out to pay running expenses. A mill will be erected shortly on the Alameda mine, which is on the great mother lode. Some 40 or 50 tons are now being treated in the Patterson mill at Tuttletown, which will clearly demonstrate the value of the mine.

THE DUTCH MINE, near Quartz mountain, owned by the Fitzgerald Bros. and Lucas, is reported to be showing very fine rock. The owners have an engine in place, and are now running in two drifts, expecting soon to commence sinking. The property is undoubtedly a very valuable one.

GOLDEN GATE.—A great deal of trouble is being occasioned by the furnace at the Golden Gate mine. The mill was stopped on its account for several days a few weeks ago. The whole furnace has now fallen in and will have to be rebuilt before operations can be resumed.

NEVADA.

Washoe District.

SILVER HILL.—Virginia *Enterprise*, Nov. 16: Are doing a good deal of prospecting on the 260 level.

ALPHA.—The west crosscut, 500 level, 100 feet north of the shaft, is out 330 feet; face in quartz and porphyry. Good headway is being made in the new station at the 500 level.

EXCHEQUER.—On the 382 level the east crosscut, 150 feet south of north line, is out 159 feet; face in porphyry. The west crosscut on the 500 level on the north line is out 73 feet; face in quartz and porphyry.

GOULD & CURRY.—The northwest drift on the 200 level continues in soft porphyry. No. 1 west crosscut on the 400 level is also in porphyry.

HALE & NORCROSS.—Are at work from the 300 down to the 1200 level. About 150 tons of ore are daily sent to the Nevada mill. Some repair work is still in progress.

POTOSI.—Still making some repairs on the 750 level. The face of the south drift on the 850 level continues in hard vein porphyry.

CON. NEW YORK.—The raise on the 800 level is up 132 feet on the stope; the roof in quartz giving fair assays.

WARD COMBINATION SHAFT.—The east drift, 1800 level, is out east from the shaft 37 feet; face in porphyry.

OVERMAN.—Last week took out 278 tons of ore and sent 236 to the Vivian mill. On the 6th of November shipped one bar of bullion valued at $1718.76.

CON. IMPERIAL.—The face of the north drift on the 300 level is showing ore of low grade. An east crosscut from this drift has been commenced, and is out 23 feet. The face is in a mixture of clay and porphyry.

SAVAGE.—Good progress is making in the new southeast drift on the 300 level. Ore is being ex-

tracted at two points on this level. On the 500 level are extracting fair grade ore from the north and south upraises, and also in the east drift from the west upraise and from the north drift. The Rock Point mill is crushing ore from this mine, and shipments are steadily continued.

CHALLENGE CON.—The joint Confidence and Challenge west crosscut from the 300 level north drift is out six feet, having been started during the week. The face is in clay. The other work, joint with the Con. Imperial, is mentioned in the report on the mine.

SEG. BELCHER.—The west crosscut on the 1200 level is passing into favorable ground composed of streaks of porphyry and quartz.

CONFIDENCE.—The work is joint with the Con. Imperial and Challenge Con., mentioned in another place.

CHOLLAR.—The northwest drift on the 500 level is in quartz that gives low assays. Prospecting is in progress on the 850 and 750 levels. Ore is being regularly shipped to the mill.

CROWN POINT.—The 800 winze is down 48 feet and the bottom is in quartz giving low assays. Have cleaned out the 900 south drift a total of 588 feet. Have shipped to the Mexican mill for reduction 335 tons of ore since Nov. 1st. This ore was broken down during the last two months, but was allowed to remain in the chutes and dumps on account of low water in the river. Are now shipping 70 tons of ore per day.

BELCHER.—The east crosscut known as No. 2 on the 1200 level, is out 160 feet. The face of the drift is in porphyry. No. 3 crosscut on the 1200 level is out 100 feet, having been extended 23 feet. The face is in low-grade quartz assaying from $5 to $12 per ton.

JUSTICE.—Have started a north drift from the winze below the 822-foot level. It is out 40 feet, skirting the east wall. Shipped to the mill during the week 230 tons of ore, the average battery assay of which was $31.33 per ton.

CON. CAL. & VIRGINIA.—Are extracting the usual amount of ore from the ore breasts on the 1300, 1435, 1500, 1600 and 1650 levels. The average of the battery samples shows the ore that is being reduced at the Morgan and Eureka mills to be a little over $27 to the ton.

ALTA.—The daily yield of the mine is about 45 tons of ore. This ore is taken from the 852 and 925 levels. The mill is doing its work very satisfactorily.

BALTIMORE.—Still operating on the 225 and 338 levels, and saving up ore for reduction. At several points good streaks of ore have been encountered.

UNION CON.—The north lateral drift on the 1465 level has reached the north line of the mine.

OPHIR.—The east crosscut on the 1300 level has its face in a favorable mixture of quartz and porphyry. A north drift is being pushed from the end of this crosscut to connect with the top of the upraise from the main drift on the 1465 level.

MEXICAN.—West crosscut No. 1 on the 1465 level is in a vein material composed of clay, porphyry and quartz, which is of a promising appearance.

UTAH.—The formation in the southeast drift on the 600 level continues hard. The rock is porphyry. Some water is coming in at the face of the drift.

OCCIDENTAL CON.—The mine continues to look well. The weekly yield of ore is about 300 tons, which is of an average assay value of $21 a ton.

SIERRA NEVADA.—The main east drift on the 520 level still continues in porphyry.

NORTH OCCIDENTAL.—The south drift from west crosscut No. 2, on the 300 level, is now showing ore of good quality.

Jumbo District.

TESTING ORE.—Virginia *Chronicle*, Nov. 13: A shipment by team of 40 tons of ore from the Wild Goose mine has recently been made to the Taylor mill near Silver City. The ore from the Wild Goose is found to contain a large percentage of sulphurets and rusty gold that cannot be saved on the copper plates at the Dunlop mill, which is only equipped for saving the gold in the ore by that process. Should the test run at the Taylor mill show a saving by running the pulp through the pans sufficient to warrant it, the Dunlop mill will be provided with the pan process of amalgamating,

Morey District.

PROSPEROUS. — Belmont *Courier*, Nov. 16: Thomas Graves visited Morey last week and inspected the mines of that district. He says that the mines there are yielding rich silver ore in large quantities, and that the work of development is pushed with energy by H. A. Cohen and by the lessees, Moore and Schendell. Morey is a prosperous camp.

Philadelphia District.

RICH ORE —Belmont *Courier*, Nov. 16: Laity & Clifford are still encountering rich ore in the Laity mine at East Belmont. With the judicious expenditure of money every mine in East Belmont could be made to pay handsomely. Philadelphia district is not half prospected. A railroad through this section would make things boom.

Pioche District.

THE RAYMOND BLACK LEDGE.—Pioche *Record*, Nov. 16: The work of draining the Black Ledge winze on the 1200-foot level of the Raymond mine began in earnest on the 3d inst., and yesterday the water was pumped out to a depth of more than 90 feet, an average of 15 feet per day. In addition to the small pump, water is tanked, both engine and pump being run by compressed air. So far the winze numbers are found in place and in good condition. No caves have been encountered, though in one or two places the winze was blocked with old timbers and waste from above. When work was suspended on this winze by the Raymond & Ely Co. years ago through an accident and rush of water, the indications were particularly good, and we shall soon know what mineral wealth that part of the mine contains. The winze is 290 feet in depth. In another two weeks the bottom will be reached, when a crosscut will immediately be made for the ledge, which it is thought is less than ten feet away.

TRAMWAY.—To facilitate the delivery of ore and supplies at the Reduction works, the present narrow-gauge railroad ending at the Raymond Works, is to be at once extended along the hillside west of town and will terminate at a point in the vicinity of the schoolhouse, where a general delivery station will be established. When it is done it will, when compared with the present method, be a comparatively easy matter to get outside ore, wood and coal to the Raymond, and the Reduction works.

Tuscarora District.

NAVADO.—*Times-Review*, Nov. 15. The stopes are looking fair.

BELLE ISLE.—On the 240-foot level, crosscut west has been extended, through low-grade ore, nine feet.

NORTH COMMONWEALTH. — Joint crosscut east, 225-foot level, extended 11 feet. South drift from same crosscut advanced 16 feet. The face of the drift shows some high-grade ore.

NORTH BELLE ISLE.—A station at the 600-foot level is now being opened. The usual amount of ore has been sent to the concentrator.

DEL MONTE.—North drift, 225-foot level, extended 10 feet. There is a strong flow of water and the formation looks favorable. The face continues to show some high-grade ore.

GRAND PRIZE.—Stopes have improved in quantity and quality of ore yielded during the past week. High-grade streak in east stopes looking well.

COMMONWEALTH. — 100-foot level: No. 1 east crosscut from north drift extended 13 feet—total 88 feet—and continues to expose good ore.

ARIZONA.

RYLAND.—Prescott *Courier*, Nov. 14: Frank Ryland's old mine, the Southern Belle, now the Ryland, has a sterling reputation. Instead of becoming base, the ore is getting freer and freer. A very few men knock out enough ore for the 20-stamp mill.

TURKEY CREEK.—John Holmes of Turkey creek district has put in the past year in drifting into his vein. He has now plenty of ore above, below and ahead of him. He is shipping a few tons to get money to keep up working expenses.

NOTES.—S. G. Turner, from head of Big Bug, says Joe Chambers is doing good milling and concentrating in Walker district. The Dixie Co., in same district, has good ore, and runs its mill when there is water. The Silver King, Groom creek, is now said to be producing rich sulphides. We heard, yesterday, that Mr. Williams, superintendent of the Hackberry, had let a contract for 1500 cords of wood. Owners of placer mines are getting them ready so that when water comes they will be made to yield gold.

TOMBSTONE. — *Prospector*, Nov. 14: The hills around Tombstone are alive with prospectors who are doing their annual assessment work. C. F. Heyne has taken charge of the Fisher group and has several men employed doing assessment work. The Herschell is not producing much ore at present, but considerable prospecting is being done in the north end. No shipments have been made for some time, but the second-grade ore on the dump has been worked at the mill. An important strike was made during the week on the Comet. This mine is proving a bonanza and will, it is said by those who are in a position to know, prove another Emerald. The Turquoise mines are turning out their full share of ore, which is still being hauled to Fairbank by Durkee's teams. The T. M. & M. Co. is doing a great deal of prospecting work at present. The big second-class ore-dump on the Lucky Cuss is growing to immense proportions and the first-class ore is shipped.

PROSPEROUS.—*Silver Belt*, Nov. 16: The Old Dominion Copper Co. is enjoying a prosperous season, seldom if ever equaled in its history. Under the intelligent management of Supt. A. L. Walker and his efficient assistants, work in the several departments proceeds with gratifying success. Their mine, the Globe, seems to steadily improve as depth is attained, and a world of ore is now revealed in the several levels. Two furnaces are in blast and a third is being repaired to be ready in the event of its being needed.

COLORADO.

SAN JUAN.—Denver *Republican*, Nov. 16: E. W. Walters, superintendent of the Sunnyside Extension mine above Silverton, said that the mine he represents is fully as good as its fortunate owner, Mr. Rasenus Hansen, desires, and one would naturally think that that meant a great deal. At the mine 18 men find employment and 10 men are at work at the mill below. It is the intention to keep the stamps dropping until Christmas Day, but the mine will be worked for all there is in it throughout the winter. Mr. Walters refused to say what the grade of the ore taken from the property was, and especially that portion of it which passes under the stamps. However, from outside sources it is learned that it is a little better than one ounce in gold to the ton. Mr. Walters talked in a general way about the entire San Juan country. He says that the winter months are not nearly so much of a drawback to that section as they were a few years ago. Boarding-houses and tunnel-sites are now generally located at some point where they will be free from snow-slides, sufficient provision is packed in early so as to supply the miners with grub for the season, and the boys are generally content to stay through the dismal months so they can have a stake upon which to operate for themselves in the summer.

IDAHO.

BEAVER CREEK.—Idaho *World*, Nov. 14: The batch of ore from the Horn Silver mine, Beaver Creek district, lately crushed in the Elmira mill at Banner, yielded the largest of any surface rock ever crushed in the county. Two or three hundred sacks will be sent to Omaha for reduction in a few days. There are four parallel veins in the district, which is a few miles beyond the head of More creek, and development work will be carried on in the Horn Silver, owned by A. W. Dunn and M. H. Kempner, and the Peep of Day and Mammoth, owned by Mr. Kempner and Dr. Southworth. A 500-foot tunnel will be run to develop the Horn Silver at depth. Six men are now at work in the district.

PLACER CENTER DISTRICT. — Wardner *News*, Nov. 9: Work on the Granite mine is about equally divided in the various tunnels and stopes. The lower tunnel is in 600 feet; at a distance of 550 feet a crosscut has been run 75 feet in a northeasterly direction at the extremity of which the vein was struck, and drifting is progressing both east and west upon it. The east drift has reached 75 feet and the west 30 feet; in both workings a fine body of galena ore is visible. At a point 20 feet distant from the starting in of the east drift an upraise of 40 feet has been made, from the top of which a drift has been run 20 feet to connect with the main shaft for ventilation. A large amount of stoping is going on in this working. The upper tunnel is in 450 feet; an upraise has been made from its face to connect with a drift lately run from the old workings for ventilating purposes. At a point 150 feet from the entrance a shaft has been sunk 200 feet, connecting with the lower tunnel, and through which all the ore is conveyed from above. At the 60-foot level much stoping is progressing. Among the improvements visible near the mine is a lodging-house, which has just been completed, affording ample accommodations for a large number. Sixty-five men are now employed, with Geo. Albright as foreman, Jno. Morgan night boss, and all under the superintendence of W. Y. Williams. The mill, under guidance of D. H. O'Neill, runs night and day, averaging 15 tons of concentrates every 24 hours. Work is progressing on the dam on the south fork for the Bunker Hill & Sullivan Co. as fast as it is possible for the initial operations to proceed. A new wagon-road from the Sierra Nevada mine to a point on the railroad near Day's ranch will be finished to-day. Agents all along the line of the Cœur d'Alene railway and sawmill men are complaining of their inability to secure cars enough to transport ore and lumber. Twenty-five carloads of ore are lying at Wardner awaiting shipment to the smelters.

LOW-GRADE ORES AT ATLANTA.—Wood River *Times*, Nov. 14: Major Frank P. Cavanah, who recently visited Atlanta, says that the new process is a pronounced success. Five stamps only have been dropping at the Buffalo mill, which reduce eight tons of ore each 24 hours—all of which passes over one vanner. The slimes from the bottom of the concentrator run through a series of settlers and the concentrates from these settlers alone have paid all milling expenses. After leaving the settlers the tailings run over burlaps a distance of 115 feet, after which experiments have proven them of no value—showing conclusively that all mineral is saved. Fifty tons of ore are reduced to one ton, and the concentrates shipped to Denver for further reduction. Miners have proposed to take out rock and place it in the ore-house for $1 per ton; from there it costs $1.25 to get it to the mill. So it is evident that with a few more stamps and vanners large quantities of low-grade ores can be worked at a big profit.

DAKOTA.

SYNDICATE SMELTERY. — Deadwood *Pioneer*, Nov. 13: A *Pioneer* reporter yesterday visited the site where the Miller syndicate proposes the erection of a 40-ton smeltery to practically demonstrate the value of pyritic smelting for treating Black Hills refractory ores. Contractor Damon has quite a large force at work and last night practically completed grades for the first or lower wall and the building proper. If machinery is not delayed en route there is no reason why the plant need not be completed and in blast within four weeks.

REDUCTION WORKS.—Col. Carpenter has all the men he can employ to advantage busy in blacksmith shops at the reduction works, repairing machinery, straightening out affairs and getting everything in readiness for carpenters. Col. Pratt yesterday delivered the first installment of the 150,000 feet of lumber to be used in construction of the building. Works are to be pushed to completion as rapidly as possible. While they probably cannot be finished at as early a date as Syndicate smeltery, the difference in time will be comparatively trifling. Both plants should certainly be in operation by or before January 1st.

MONTANA.

A MONTH'S WORK.—Butte *Miner*, Nov. 13: The Boston & Montana Co. is running full blast in all departments. During the month of October the works produced 2,525,818 pounds of fine copper and 2700 ounces of silver. This is a large output for the works, and another large dividend may be expected when the proper time arrives.

ORO FINO.—From a gentleman who came in from Oro Fino district yesterday it was ascertained that the Phœnix company, organized only a short time ago, had succeeded in disposing of the larger portion of its treasury stock, 275,000 shares. The company has three claims, the Beauty, Owl and Phœnix, the latter having the largest vein of quartz in the district. It is not known exactly what the ore assays, but it is said that it is fair. The Phœnix properties are in close proximity to the Champion and are just east of the Oro Fino. The drift from the 100-foot shaft on the American Ruby is now in 40 feet and the superintendent, Mr. Hoyer, thinks that the high-grade ore vein, the one he is now after, will be struck about to-morrow. One body of ore has been already cut, but it was low-grade in character and identical to that found in both the Champion and Mountain Lion, but near which pay ore was struck in both mines.

LOOKS RATHER SUSPICIOUS.—The Big Ox Mining Co., which has its office at Helena and its mine about five miles north of Marysville and the most of its jawbone floating around through the East, is doing an immense amount of business in one sense of the word. It has already sent out 1,000,000 circulars, all of which went East, and has another million ready. No work is being done at the mine, the ore not being rich enough to work.

NEW MEXICO.

A RICH GROUP.—*Southwest Sentinel*, Nov. 12: The recent sale of a three-fourths interest of the Grand Tower group of mines of the Gold Hill mining district, Grant county, N. M., by and through Mr. Geo. H. Utter of this city to Messrs. Forbes and Lee of Ohio, has resulted in the organization of the White Tower M. and M. Co., and the development of this rich group of mines with Major J. L. Pritchard, a Colorado miner of 30 years' experience, in charge. Since the sale of the property in September the company has put up commodious buildings at an expense of about $3000, and done over 200 feet of work in developing the Grand Tower mine. Eighteen hundred tons of free-milling silver ore that will average over $30 per ton has been mined and is awaiting the erection of a mill, which the company proposes to put up on the ground as soon as the 300-foot level is reached and prospected. Ore varying from one to four feet in width and assaying from $50 to $200 per ton in silver is found on one or both of the walls. This rich ore is being shipped and the company is paying the development expenses from the proceeds.

DEVELOPMENT WORK.—Silver City *Enterprise*, Nov. 16: The mines of Silver creek are fast coming to the front as producers. They contain large bodies of high-grade ore, and several of them are returning handsome profits to their owners. Work was resumed by the Deep Down company this week. The mill will be started up when the contract on the shaft is completed. John A. Miller is in from Carlisle district. He has 12 men working on the Nugget, and has leased the Telegraph mill and will soon have a string of teams hauling ore from the mine to the mill. Jo E. Sheridan is erecting buildings at his Cow Springs property, and is otherwise preparing to commence mining operations there on a more extensive scale than heretofore. The Bremen mill, under the management of J. F. Smith, is now running day and night, and from now on will continue to furnish regular shipments of silver bricks. Two hundred tons of ore from the Yankee Girl, Mr. Bremen's new property in the Burros, will be hauled in for treatment, which will average about $40 per ton. The new strike in the Bremen mine is increasing in magnitude as work progresses. The ore is of a leady character, and cannot be treated in the mill, but as it will average from $250 to $300 per ton, it can be shipped to the smelters and treated at a reasonable cost. The closing down of the Aztec mine and mill has been the means of causing no end of talk and surmises as to the next step to be taken by the management. It seems to be the general impression that the St. Louis management is playing a game of freeze-out with local stockholders. It is stated, on what may be considered fairly good authority, that work will soon be commenced on the tunnel, which will be driven in to tap the lead. Had this piece of work been completed at the commencement of the work, thousands of dollars in developing and handling the ore and waste could have been saved, and the 20-stamp mill supplied with ore. There are many in this community who severely criticised the management of the Aztec from the start, claiming that $50,000 judiciously expended would accomplish more than the $150,000 which the present development work has cost the company.

LOWER CALIFORNIA.

CAMP ALAMO.—San Diego *Sun*, Nov. 13: "Yes, I am just back from Alamo," said T. J. Hubbell. "I was greatly disappointed in the mines, as they were much richer than I expected. "I made two locations which are being denounced for me. Forty feet below the surface I took out 200 pounds of quartz, carrying it up in one of the rawhide buckets they use there. I lastly cleaned the bucket out. There was three ounces of dirt left in it, and from that the fine gold you are looking at was crushed out. If three ounces give 48 cents, the average will be very rich. I shall take this rock with me on the boat in the morning, to let it show for itself at San Francisco. It will run from $100 up to $3000 a ton. Before long you will hear of some important sales at Alamo. Since 1859 I have had experience in every camp on the coast, but with the exception of the Comstock I consider Alamo the richest of all. Why, the Peninsula is one big quartz ledge! There are now more fine claims untaken than have been denounced."

OREGON.

CRACKER CREEK.—Baker City *Democrat*, Nov. 11: Manager C. M. Donaldson, of the Eureka & Excelsior Mining Co., at Cracker Creek, is in the city and informs the reporter that the company's new mill will be ready to steam up on the 25th unless some unforeseen accident occurs.

THE VIRGINIA.—Mr. John H. Mitchell, owner of the Virginia mine, of Robinsonville district, was met yesterday by the *Democrat* reporter, and when asked regarding the result obtained from the milling of his ores replied: "Twenty tons of ore milled at the Bonanza mill yielded 142 ounces of amalgam, which retorted gave 91 ounces in gold, and from 15 tons milled in the Golden Monarch mill at Clear Creek, 71 ounces of gold was obtained." Speaking further, he said: "I have upward of 60 tons of the same ore now on the dump and expect this month to crush at least 100 tons. The mine is in splendid condition for work, and besides developing the property, I will have 500 tons ready for the mill by the first of next June."

WHITE STAR.—In conversation yesterday with Mr. J. H. H. Williams, of N. Y. City, one of the directors of the White Star Mining Co., the reporter was informed that it is the immediate intention of the company to place on the Big Aleck mine more extensive machinery, the purchasing of which Mr. Williams will attend to as soon as he returns East. The company have recently had placed at their mine an Oregon amalgamator, the invention of E. L. Giroux, and it has proven itself to do all that is claimed for it, and in the opinion of Mr. Williams and Capt. Baxter, manager of the company, it is the best amalgamator ever invented. The company has purchased the plant and intends soon to add one or two more.

UTAH.

FROM ALTA CAMP.—T. W. Buzzo from Alta reports that during the recent snowstorm the road between Alta and Wasatch was closed for 10 days and only opened by the combined labor of 40 men shoveling snow for several days. There is about 100 tons of ore up there to come down, but the great object for clearing the road was to get in supplies for the winter's work at the various mines. There will be employed at the mines during the winter about 100 men in the camp, chiefly on prospecting work. During the summer Mr. Buzzo worked 12 men on the Montezuma, besides the six men working on contract in driving an upraise. This work will continue through the winter, but the work of stoping has ceased till spring. The Emma is reported as getting fine indications in the eastern part of the property in new ground. The Toledo did well the past season. The City Rocks, Victoria, Imperial, Flagstaff, Vallejo, the Green & Burns property and Prince of Wales will all have work done through the winter, and all have in, or are laying in, their supplies. Over toward Big Cottonwood a number of leasers are busy on various claims and will continue through the winter. Mr. Brant is operating several claims with a small force of men. Wall & Prickett will continue work on the Peruvian during the winter. Next year promises to be a good one for Little Cottonwood.

MECHANICAL PROGRESS.

The Iron Industry of China.

United States Minister Denby of Peking, in a recent report to the Department of State at Washington, communicates some interesting facts in regard to the feeling in China relative to the importance to that people of taking steps to develop the home iron interests of that country. Minister Denby says:

"I have the honor to inclose an imperial decree commenting on the late proposal of the Viceroy of Canton to develop the iron industry in the two Kuang. In order to foster this important industry he has abolished the inland duties on iron and the prohibition against its export. He now proposes to investigate, by a commission, the subject of abolishing the heavy duty now levied on furnaces. Such a plan put into force for three years would not involve a large diminution of the revenue, but would greatly benefit the iron producers by doing away with illegal fees. He proposes also the creation of a joint-stock company to work the foundries with foreign machinery. It would seem that the mind of this distinguished man, Chang Chi Tung, had undergone a change. He now, while still materially seeking to retain for his own people the benefits of industrial enterprises, favors the extensive use of foreign methods in building railroads and establishing electric lights and foundries. I do not doubt that the next process in his mental development will lead him to the only correct conclusion; that is to say, that foreign talent and honesty and will-power are indispensable to the successful introduction of foreign improvements."

The inclosure in Minister Denby's report is as follows:

"The Viceroy of Canton states that iron is the chief mineral production of the two provinces within his jurisdiction. And yet for many years past there has been an immense consumption of foreign iron all over the country. Under these circumstances he considers it absolutely necessary that the native iron industry should be further developed; and with this object in view, he has already procured the abolition of inland duties on iron and the removal of the prohibition against its export. A commission, which he appointed to investigate the whole subject in both provinces last year, reports that the great obstacle to the extensive production of native iron is the heavy duty levied upon furnaces. Of these there are three kinds: Government furnaces, which pay each 53 taels a year to the financial commissioner; local furnaces, which pay an annual fee of five taels to the salt commission; and unlicensed furnaces, which pay nothing at all. It is now proposed that all distinctions should be abolished, and for the period of three years no tax should be levied upon furnaces of any kind. This will only involve a diminution in the revenue of something less than 2000 taels, but the gain to the iron producers will be much larger than is represented by the above sum, for the exemption of the furnaces from all Government taxation will necessarily imply the discontinuance of the illegal fees which have hitherto been exacted, and which have proved the real hindrance to the development of the trade. A scheme is under consideration for the establishment of a joint-stock company to work the foundries with foreign machinery, and great results are expected from the adoption of foreign methods of smelting, which are now receiving careful attention. If only the native industry can be stimulated and the consumption of the foreign article gradually checked, all classes of the community will benefit by the change, and no regret need be felt for the small sacrifice of revenue which it will for the present entail. The viceroy's views on the subject have received the cordial approval of the Governor of Kuang-Si, and the memorial is presented in their joint names."

Indian Iron and Steel

Elate with their victories in the metallic realm, modern European and American metal-workers and engineers are liable to be unduly exalted, and carried away by an entirely comprehensible vanity, and consider that no previous generation and no other people can know anything of consequence respecting the adequate treatment of metals, especially iron and steel.

"What other races beside those of Europe and America," perhaps they will ask, "could erect an Eiffel Tower, or a Forth Bridge, or make a steam hammer, or build an ocean liner?"

The question may be impossible to answer, but it is at least certain that Oriental people—even at a time when our forefathers could hardly deal with iron at all—did marvels with the stubborn metal, and can still do so.

In evidence of the fact may be instanced that immense iron column called the "Lhat" (or pillar) of Delhi, exhumed of quite recent years, a colossal column of nearly 60 feet in length and of proportional diameter, believed by adepts to be an architectural work, and to be of wrought iron. Even with the aid of the steam hammer this would now be held an almost impossible piece of forging, and how the weakly Hindoo could have beaten such an immense glowing mass into form with hand hammers is a crux to all modern technicists.

Then, again, the early Syrians of Damascus forged scimitars of such excellence and of so fine cutting qualities that no modern sword-cutler of Europe can equal, far less surpass, them. Moreover, some of the rude tribes of Central Africa produced cutting weapons of high excellence.

In the same way the extremely thin Chinese cast-iron rice-pans, manufactured at the towns of Samtin-chuk and Fat shan, are unequaled by the work of any English or American iron-founders.—*Ex.*

SHIP BUILDING ON THE PACIFIC COAST.—In the published "Proceedings of the National Institute" we find the following complimentary remarks in regard to ship-building on this coast at a not very recent date: "In 1876 the specifications for the iron steamer Meteor, to run on Lake Tahoe, Cal., called for a speed of 20 miles per hour. She was built and launched that year at Glenbrook, on the lake. The engines were built at Marysville, Cal., and all material and machinery were teamed over the mountains. There was no previous record of a vessel's steaming 20 miles per hour. The Meteor is 64 feet 6 inches long, with 10 feet beam, and a draught of 5 feet aft and 3 feet 1 inch forward, and a depth of hold of 5 feet. She is of 19 5 tons displacement, with fuel and 12 passengers on board, and is divided into water-tight compartments. The boiler is of steel, locomotive type, and carries 150 pounds pressure. The engines are one pair inverted cylinders, 10 inches diameter and 12 inches stroke, and weigh 2600 pounds with all fittings. The propeller is of brass, three-bladed, and finished all over. The Meteor made 21 miles per hour, repeatedly, over a measured mile, and from Glenbrook to Tahoe City she made 12 miles in 38 minutes, or 18.9 miles per hour. The engines made between 270 and 280 revolutions, and were designed and built by W. R. Eckart." In referring to the speed of the Meteor, we presume the writer referred to vessels of the Meteor class, in which relation the compliment would have been sustained by facts. The success which has since attended the Union Iron Works of this city in the construction of iron coastwise and national steamships would more than emphasize the remarks in the "Proceedings" above quoted.

HOW THIRTY-THREE THOUSAND POUNDS WAS MADE A HORSE-POWER.—When men begin first to become familiar with the methods of measuring mechanical power, they often speculate on where the breed of horses is to be found which can keep at work raising 33,000 pounds one foot per minute, or the equivalent, which is familiar to men accustomed to pile driving by horse-power, of raising 330 pounds 100 feet per minute. Since 33,000 pounds raised one foot per minute is called one-horse power, it is natural for people to suppose that the engineers who established that unit of measurement based it on the actual work performed by horses. But that was not the case. The horse-power unit was established by James Watt about a century ago, and the figures were settled in a curious way. Watt, in his usual careful manner, proceeded to find out the average work which the horses of his district could perform, and he found that the raising of 22,000 pounds one foot per minute was about an actual horse power. At this time he was employed in the manufacture of engines, and had almost a monopoly of the engine-building trade. Customers were so hard to find that all kinds of artificial encouragements were considered necessary to induce power-users to buy steam engines. As a method of encouraging business, Watt offered to sell engines reckoning 33,000 foot-pounds to a horse-power, or one-third more than the actual. And thus, what was intended as a temporary expedient to promote business has been the means of giving a false unit of a very important measurement to the world.

NEW AND IMPROVED WATER PIPE.—Mepham Ferguson of Melbourne is the patentee of an invention calculated to be of great service to the mining community, and will also prove very useful in all works where water has to be conveyed for any great distance in pipes for domestic or irrigation purposes, the small cost rendering it an easy matter to overcome the natural surface difficulties that sometimes hamper property-owners when they have to carry the water over gullies and ravines. The patented pipes are made in lengths of three feet, so that they are not only easily handled or transported, but much labor is saved in vertical riveting. Each length of pipe being slightly beveled between the ends and closely riveted, the jointing is effected by heating and expanding the larger end of pipe, and is thus shrunk on. A considerable saving is thus effected in the jointing, for neither lead nor yarn is required, and the pipes can be jointed by comparatively inexperienced men. The pipes are coated both inside and outside, principally with patent prepared Trinidad asphaltum, which renders them impervious to injury, either by the atmosphere or by mineral acids or water. Tests of these pipes have been made in the presence of Mr. Davidson of the Melbourne Water Supply Department, and others, with very satisfactory results, inasmuch as at a pressure of 450 pounds to the square inch the pipe burst, but the joint remained intact. With regard to the laying of the pipes, with the material, on the ground and under ordinarily favorable circumstances, the inventor claims to be able to lay down a quarter of a mile of piping per day.

COKE requires one-third more air for combustion than coal.

SCIENTIFIC PROGRESS.

Modern Extinction of Species.

The relentless destruction of certain animals by man in his greed for gain, bids fair, at no great distance in the future, to add many other names to the already long list of animals which have become extinct; not as heretofore, however, through the revolutions of nature and the law of the survival of the fittest.

Half a century ago New England owned a fleet exceeding in the aggregate 100,000 tons, employed in the whale fishery. So profitable was the business that many flourishing cities and towns were built up thereby. Whales abounded everywhere and every ocean on the globe was regarded as profitable fishing grounds. Now there are not 5000 tons of shipping belonging to New England engaged in this one great and profitable business.

It is curious to note how these great leviathans of the deep have been gradually driven from the open seas of the world and compelled to seek a refuge among the ice-covered waters of the Arctic and Antarctic regions. Two hundred years ago they abounded in all parts of the Atlantic and Indian oceans, and in most of their bays and harbors. One hundred years ago La Perouse declared that he could not remain at anchor in the Bay of Monterey "because the whales spirted their filthy liquid upon the decks of his ships." Less than half a century ago the Bay of Todos Santos, on the shore of which the town of Ensenada has since been built, so abounded with whales that a ship could be filled with their oil in a few months.

Now it is a rare thing to meet with one of these monsters south of Behring's Straits on the Pacific, or Baffin's Bay on the Atlantic. So scarce are whales to-day that our San Francisco fleet of whalers can scarcely make it profitable to hunt them, even in the Arctic Sea. The fleet is now returning from this season's hunt with scarcely enough oil to fill one-fifth of the vessels sent out. They report that even the Arctic is "fished out."

Were it not for the late and fortunate discovery of mineral oil, gas and electricity, the disappearance of whales would be regarded as a world's calamity. Still, there are so many uses to which portions of the whale may be applied, that the hunt for him will be actively kept up so long as a single specimen will reward a year's cruising. Hence it is quite evident that it is the destiny of this largest species of the inhabitants of the ocean to be ultimately exterminated to satisfy the greed of man.

There are also other animals which are now more or less plentiful that must soon go the way of all the preadamite species. The lawless hunters of the seas are pursuing with such relentless perseverance the fur seals, which for so long a time have contributed their warm and beautiful fur for the ornamentation and clothing of their human exterminators, that soon they too will become extinct, unless speedy measures are taken for their protection. The same may be said of the beaver. The buffalo of our great central table lands has also been driven to the very verge of extinction by the remorseless hunters of the plains.

With the opening up of India and interior Africa, we may also look to the gradual extinction of the elephant, which is already being remorselessly hunted out of existence for nothing but his tusks, while almost or quite as good a substitute for all useful purposes may be found in the various chemical preparations which science has devised. There are various others among the larger inhabitants of the forest which are fast going the same way. We may allude to the moose in the woods of Maine, to various species of the bear family, and to the elk. The deer is so easily domesticated and so quiet and beautiful in confinement, that he will in all probability be suffered to survive for the regal chase in kings' preserves or to beautify with his presence the ornamental grounds of the more plebeian landholder.

The Phonograph Suggested Two Centuries Ago.

We often repeat the familiar phrase, "There is nothing new under the sun," writes W. H. K. Wright in *Public Opinion*, and indeed it seems as if the most startling and wonderful inventions of modern days were but old notions clothed in new dresses. I am led to make these remarks by the discovery in an old volume in my possession of what appears very like Mr. Edison's phonograph. The publication of this statement can in no way detract from Mr. Edison's fame, or depreciate the value of his wonderful inventions; but it is due to the Old World writer, from whose works I cull the extract, to place the fact upon record, especially at this time when the perfected phonograph is arousing so much interest among "all sorts and conditions of men."

The volume to which I refer is entitled "The Comical History of the States and Empires of the Worlds of the Moon and Sun. Written in French by Cyrano Rergerac, and newly Englished by A. Lovell, A. M., London." In this curious volume is given a graphic account of the writer's adventures in the sun and moon. While in one of the cities of the moon he meets an inhabitant of the sun, who had also visited the moon on a voyage of discovery. They fraternize and stroll about together, taking note of the strange and wonderful sights there witnessed. After a while the inhabitant of the sun is compelled to leave, but before doing so he gives his companion some seasonable advice, and says further:

"During my absence I leave you a Book, which I brought with me from my Native Country; the title of it is 'The States and Empires of the Sun, with an Addition of the History of the Spark.' I also give you this, which I esteem much more, it is the great Work of one of the Philosophers of the Sun....Having said so, he left me; and no sooner was his back turned, but I fell to consider attentively the Books and their Boxes, that's to say, their Covers, which seemed to me to be wonderfully Rich.

"As I opened the Box, I found within somewhat of Metal, almost like to our Clocks, full of I know not what, little Springs and imperceptible Engines. It was a Book, indeed; but a Strange and Wonderful Book, that had neither Leaves nor Letters. In fine, it was a Book made wholly for the Ears and not the Eyes. So that when the Body has a mind to read in it he winds up the Machine, then he turns the Hand to the chapter which he desires to hear, and straight as from the Mouth of a Man, or a Musical instrument, proceed all the distinct and different Sounds, which the Lunar Grandees make use of for expressing their Thoughts, instead of language.

"When I since reflected on this Miraculous Invention, I no longer wondered that the Young Men of that Country were more knowing at Sixteen or Eighteen than the Gray-Beards of our Climate; for knowing how to Read as soon as Speak, they are never without Lectures in their Chambers, their walks, the Town, or Traveling. They may have in their Pockets, or at their Girdles, Thirty of these Books, where they need but wind up a Spring to hear a whole chapter, and so more if they have a mind to hear the Book quite through; so that you never want the Company of all the great Men, Living and Dead, who entertain you with *Living Voices.*"

A few weeks ago we called attention to the recent discovery of an old book in Italy wherein the fact was mentioned that an Italian had made the discovery that the electric display in a thunder-storm was identical in character with the electricity produced by an electrical machine. This book having been printed several years before Franklin made his kite experiment, it was suggested that the American philosopher might have had some knowledge of the contents of the book.

So the above description of these imaginary books with *living voices* is so nearly akin to the phonograph that one is naturally led to inquire if the story of these books ever came under the notice of Mr. Edison before he began the series of experiments which have resulted in linking his name so indissolubly with undying fame.

ALL OUR COLORS COME FROM NATURE.—We get all our colors from nature, for man cannot create even a shade that did not previously exist. It is a remarkable arrangement of nature that the subdued colors are in the greatest abundance. The neutral tints that wear well to the eye are to be found everywhere; the more brilliant shades are given to us more sparingly. We find them beautifully arranged in the animal, vegetable and mineral kingdoms. In our depraved tastes, sometimes, rarity is mistaken for beauty, while something beautiful that exists in great abundance all around us is ignored by every one. The esthetic Oscar Wilde's trip to this country did much to educate the popular mind to appreciate what was truly beautiful in nature, regardless of its abundance or rarity. Previous to his coming the beautiful ox-eye daisy that blossoms in such abundance was neglected by every one but the farmer, and he looked upon it as a pest to be eradicated, if possible. This is a spring blossom, which is followed in the same localities, and often on the same ground, by the golden-rod, both of which have received considerable attention since his visit to this country, and the latter stands a good chance of being selected as the national flower of our country.

SCIENTIST JOULE, who recently died in England, was almost unknown to the public, though competent men of culture rank him with Newton and Darwin. He discovered the law of conservation of energy and the mechanical equivalent of heat. His scientific achievements should have made him wealthy and famous, but he lived in seclusion near Manchester on a pension of $1000 a year granted him by Lord Beaconsfield. He was 70 years of age when he died. Now that he is dead, England with characteristic enthusiasm recognizes him as a genius and the British press eulogizes him warmly.

"FRICTION HEAT," caused by two disks of heavy iron rubbing against each other, it is supposed by some, will "take the place of steam, gas, coal and oil" at some time in the future.

THE strength of a triple-riveted joint in a boiler may be taken at about 80 per centum, approximately.

GOOD HEALTH.

VINEGAR INJURIOUS.—It is the general belief that vinegar is wholesome and a necessary adjunct to the diet of man. Occasionally, also, one hears of its being used daily in quite large quantities as a remedy for obesity. As a matter of fact, this acid might well be dispensed with altogether; and certainly, if used at all, it should be with caution. As for its being efficacious as a flesh-reducer, it is about as much so as typhoid fever or any severe disease, for it acts simply as a debilitator and impoverishes the system. Several cases of death from its use in small glassfuls daily are on record. A little good vinegar is not likely to do any harm, and when rightly used it seems to favor the digestion of certain foods. But, without doubt, as it is generally used, it does much more harm than good, and lemon juice would be far better. Even a moderately excessive use of vinegar causes internal irregularity, which may show itself either by constipation or diarrhea, also flatulency, etc. One writer considers it capable of inducing cough, flushing of the head and watery eyes. When used very intemperately, it produces blood changes, which may become immediately dangerous; if not, the decline in health is slow but certain. Besides using vinegar with caution, that used should be selected with exceeding care. Vinegar made from apples is very good, but not so good as that made from grapes. The latter is very expensive, but the chances are it will eventually be sold as cheap, and largely displace cider vinegar.

REMEDY FOR FELON.—The trouble is that all felons are not near alike. In some, deeper tissues are involved than in others, and a remedy which might act well in one case would prove absolutely useless in another. The latest addition to the list of abortive methods is recommended by a physician of Algiers. He says it is sufficient to moisten slightly around it with some water, and to pass over this surface a stick of nitrate of silver. A few hours afterward the skin becomes black, all pain disappears, and the inflammation is arrested. The blackened epidermis receives no dressing, and in six days the black color disappears. The author was induced to try this remedy in a case of a fit of gout. The patient had his great toe swollen at its base, it was painful to the touch, a little red, and the seat of lancinating pains, which disturbed the rest of the patient. The painful articulation was moistened and rubbed over with a stick of the nitrate of silver; the next day the joint was diminished in size, and was covered over with a black skin. The pain completely disappeared a quarter of an hour after the painting, and the patient got up to follow his occupations. The victim of a felon can safely try this treatment; it can do no harm. Too much confidence must not, however, be put in it.—*Boston Herald.*

TO AVOID DYSPEPSIA.—It is a mistake to eat fast. Mastication performed in haste must be imperfect even with the best teeth, and due admixture of the salivary secretion with the food cannot take place. When a crude mass of inadequately crushed muscular fiber or undivided solid material of any description is thrown into the stomach, it acts as a mechanical irritant and sets up a condition in the mucous membrane, lining that organ, which greatly impedes if it does not altogether prevent the process of digestion. When the practice of eating quickly and filling the stomach with unprepared food is habitual, the digestive organ is rendered incapable of performing its proper functions. Either a much larger quantity of food than would be necessary under natural conditions is required, or the system suffers from the lack of nourishment. The matter may seem a small one, but it is not so. Just as the man may go on for years with defective teeth, imperfectly masticating his food and wondering why he suffers from indigestion, so a man may habitually live under an infliction of hurried dinners, and endure the consequent loss of health without knowing why he is not well or how easily the cause of his illness might be remedied.—*Medical Classics.*

A GERMAN REMEDY FOR BURNS.—The celebrated German remedy for burns is made as follows: Take of the best white glue 15 ounces, break into small pieces, add to it two pints of water, and allow it to become soft; then dissolve it by means of a water bath and add two ounces of glycerine and six drams of carbolic acid; continue the heat until thoroughly dissolved. On cooling, this mixture hardens to an elastic mass covered with a shining parchment-like skin, and may be kept for any length of time. When required for use it is placed for a few minutes in a water bath until sufficiently liquid, and applied by means of a broad brush; it forms in about two minutes a shining, smooth, flexible and nearly transparent skin.—*Herald of Health.*

DRINKING PHOSPHATE.—"Give me a drink of soda and phosphate," ordered a customer at a well-known drug store, says the Troy *Times*. "Do you know what this favorite phosphate of yours is doing for you?" asked the venerable druggist as the customer drained his glass. "Killing the nausea in my stomach," was the reply. "Yes, and it's killing your stomach, too. Some of these days you'll want it copperplated, and you'll want in vain. Phosphate is something no one should take except after a full meal. Why? Well, I will explain. You wouldn't think that the inflammable ends of matches were a proper thing to eat, would you? But phosphate is derived from phosphorus, and if you use it to excess it will burn out your stomach just as alcohol would if used in excess. You feel benefited by it now, but if you keep on, the time will come when you will wish you had never heard of phosphate. Of course we sell it because there is a foolish craze for it, but I advise no one to use much of the fiery substance." "Should one use it at all?" "In moderate quantities just after a full meal it will not hurt any one; but beware of using it in excess or on an empty stomach, for if you do that organ will need half-soling some time."

CALIFORNIA SCORPIONS AND CENTIPEDES.—Tenderfeet, and even many of those whose pedal extremities have undergone the induration incident to years of existence in these semi-tropic regions, are given to the idea that the sting of the scorpion and centipede is as dangerous to life as the bite of the most venomous reptile, but that this is a fallacy is proven by many of the denizens of this sunlit land who have been stung by them and who do not regard the sting of either as being worse than the sting of a bee. George Hall of this place will pick up a scorpion with his ungloved hand and will handle a centipede that has been goaded to madness till each of its thousand feet are dripping with venom and experience no bad results. Of course George is a little eccentric, but no idiosyncrasy is an antidote for poisoning, and it is natural to suppose that any one could caress a centipede or scorpion as George is wont to do and escape injury; but as long as such experiments are unnecessary to the advancement of the cause of science we do not care to try them.—*Ontario Observer.*

SUPERHEATED AIR FOR CONSUMPTIVES.—Alexander Bowie, M. D., M. S., has tried the inhalatory method of treating consumption. He says in the *Lancet:* "My experience with the inhalation of the superheated air has, so far, yielded results of a favorable nature. The apparatus used was Weigert's, in which the temperature expired by the patient, after a few trials, may reach 120 to 130 degrees. The inspired air, according to the thermometer in the tube, may be as hot as 570 degrees, but I do not think the actual inspired air is ever hotter than from 280 to 300 degrees."—*Exchange.*

USEFUL INFORMATION.

DISCOVERY OF A NEW MIXED ACID.—It has always been the desire of engineers to obtain "black" prints from plans and drawings, in place of the present blue prints. The discovery of a new substance by a French chemist, M. Pechard, may make such a result possible. It is a mixed acid derived from oxalic and molybdic acids, and is, therefore, termed "oxalomolybdic acid." The crystals of oxalomolybdic acid, when dry, may be preserved unchanged either in sunshine or in the dark, but if moist they quickly become colored blue when exposed to the sun's rays. If characters be written on paper with the solution, they remain invisible in a weak light, but when exposed to sunshine they rapidly become visible, turning to a deeper indigo color. It is curious that this effect only happens when the solution is spread over paper or other surfaces, for the solution itself may be kept unaltered in the bottle for any length of time, except for a trace of blue at the edge of the meniscus, where by surface action a little is spread against the interior glass walls. If a sheet of paper be immersed in a saturated solution of the acid, dried in the dark and then exposed behind an ordinary photographic negative, a very sharp print in blue may be obtained by exposure to sunlight for about ten minutes. The color instantly disappears in contact with water, so that if a piece of this sensitized paper be wholly exposed to sunlight, one may write in white upon the blue ground by using a pen dipped in water. If, however, the paper with its blue markings be exposed to a gentle heat for a few minutes, the blue changes to black and the characters are then no longer destroyed by water.

NOTHING WASTED.—In a well-arranged slaughter-house, when a steer is taken in now-a-days, the only thing that is wasted is his dying breath—from the tip of the tongue to the brush of the tail, every part is utilized. The blood is sold to the sugar refinery and to button and other manufacturers for use in the arts. The hide and hair go to the tanner; the horns go to the comb-maker; the contents of the stomach is saved for manure; the scraps and pith of the horns go to the glue manufacturer; the horny portion of the hoofs go to the button maker; the shin bones after their oil is taken out are converted into handles for various purposes; other bones are used for boneblack or fertilizing purposes; the waste goes to the soap boiler. If the salable flesh will pay expenses, the refuse as disposed of as above affords a fair profit to the establishment.

TO SPLIT PAPER.—There are two ways of splitting a piece of paper. One, which has already been given in these columns, is to lay the sheet of paper on a piece of glass. Soak it thoroughly with water and then press it smoothly all over the glass. With a little care the upper half of the sheet can be peeled off, leaving the under half on the glass. Let this dry, and it will come off the glass easily; of course, the glass must be perfectly clean. The second way is a better one, but it requires good practice. Paste a piece of cloth or strong paper on each side of the sheet to be split. When it has thoroughly dried, pull the two pieces of cloth apart suddenly and violently. The paste can then be softened with water, and the two halves of the sheet easily taken off the cloths.

NOW AND THEN.—Sixty years ago railroads were unknown in this country, and the population of the United States consisted of 12,000,000 people. To-day we operate 165,000 miles of railroad and our population has increased to 60,000,000. Sixty years ago the aggregate wealth of the United States was less than $1,000,000,000; at present it is estimated at $56,000,000,000. Sixty years ago there were but three or four millionaires in the entire Union. Now there are several thousand. Forty-two years ago there was but one man in the United States who was worth $5,000,000; now there are not less than 1600 persons, each of whom is worth as much or more. Careful estimates show that there are at least 31,000 persons, each of whom is worth over $500,000, and all of whom possess an aggregate of wealth amounting to $36,250,000,000, leaving to all the other inhabitants of the country an aggregate of wealth of only $23,750,000,000. In other words, two-thirds of our national wealth has been gathered into the possession of only one two-thousandth part of our population. At this rate of individual accumulation, what may we expect to see at the close of another half-century? Is it not time to begin to look around and see if our laws and institutions cannot be so modified as to secure a more even aggregation of wealth?

UMBRELLA MAKING.—Umbrella making, says an English contemporary, is among the most interesting of Birmingham, Eng., industries. Although probably not more than 1000 hands are employed, something like 1000 patents have been taken out during the last twenty years. The most recent inventor, who, if successful, will eclipse all rivals, is a maker who claims to have contrived a transparent umbrella, which, while being equally waterproof as silks and alpacas, will have the great advantage of allowing the wayfarer in a rainstorm to avoid collisions with lamp-posts and other obstacles along the way. A remarkable feature of the East Indian trade is the large number of umbrellas imported. Last year the total received in Calcutta alone was 2,621,745. This was by far the largest import recorded for any single year, and it is not surprising to hear that the trade was somewhat overdone, and a consequent glut resulted. The United Kingdom has virtually a monopoly of the business.

POLISHING MARBLE.—The two following recipes are recommended as yielding satisfactory results: Take two parts of soda, one of pumice-stone, and one of finely-powdered chalk; sift these through a fine sieve, and mix them into a paste with water. Rub this well all over the marble, and probably the stains will be removed; then wash with soap and water, and a beautiful bright polish will be produced. If this does no good, try the following: Clean with diluted muriatic acid or warm soap and vinegar; afterward heat a gallon of water, in which dissolve 2½ pounds of potash and one pound of virgin wax, boiling the whole for half an hour, then allow it to cool, when the wax will float on the surface. Put the wax into a mortar and triturate it with a pestle, adding soft water to it until it forms a soft paste, which, laid on the marble and rubbed when dry with a woolen rag, gives a good polish.

A "SMOKELESS DUEL" is now added to "smokeless powder." A fuel of this character is just now attracting some attention in London, England. "There were two large fires burning in open grates, one fed with ordinary coal and the other with the treated coal. The ordinary coal fire gave, of course, the usual results of smoke and flame, while the fire of the treated coal was all but smokeless, but bright and with plenty of flame. The fire, in fact, was well maintained, and a good heat was thrown out. It is stated that the treatment of the coal costs 6d. per ton, all expenses included, and that the coal is greatly improved thereby, so that one ton is equal to 25 cwt. in use." The coal is treated with chemicals. This is simply an old Yankee idea. A couple of years ago there was some little stir made over it in New York, where this system was put in practice—to make the coal last longer.

CHRYSANTHEMUMS appear to be the floral rage just now. Many of the choice varieties now cultivated are really gorgeous, as was evinced at the late chrysanthemum show in this city. Chrysanthemums in ornamental pots are now introduced into some of the most fashionable drawing-rooms.

A KNOT AND A MILE.—Comparatively few newspaper readers know, or have any special reason to know, that a knot is more than a mile, and that six of the former equal about seven of the latter. Accurately speaking, there are 6086 feet in a knot and 5280 feet in a mile.

SCIENCE cannot yet distinguish as between the blood of animals and the blood of human beings.

ENGINEERING NOTES.

Important Canal Projects.

Niagara Falls Canal.—Several surveys and plans for a ship canal from Lake Erie to Lake Ontario have been made within the past 30 years, and two powerful causes push the project to the front every now and then: 1st. The very natural desire to have a canal of our own between these lakes; and 2d, the fact that the Welland canal, with its 14-foot depth, is not deep enough to accommodate modern lake traffic, a fact which will be doubly emphasized when the improvements at St. Mary's and St. Clair have been completed and a depth of 20 feet obtained. A recent project is for a canal 20 feet deep to accommodate vessels of 3000 tons. The length is about 25 miles and the estimated cost $18,000,000. An alternative route of 19 miles would cost about $1,000,000 more. This canal seems more than likely to become an accomplished fact in the near future.

Lake Erie-Ohio River.—This is a project to obtain a deep-water navigation from the Great Lakes to the Gulf of Mexico. The probable route would be from Beaver, on the Ohio, 28 miles below Pittsburg, via Newcastle and Conneaut by lake to Erie, Pa. Distance, 136 miles; summit, 416 feet above the Ohio and 509 feet above Lake Erie. A thorough survey of the proposed route will be made.

Lower Michigan.—From Saugatuck to Detroit via Kalamazoo river; length, 178 miles; width, 112 feet on the surface, 80 feet on the bottom; depth sufficient to accommodate vessels of 1200 tons; six to eight locks. The canal would give an almost air-line route from Chicago to New York, saving several hundred miles.—*Railway Review.*

ANCIENT BRIDGES IN CHINA.—The Chinese suspension bridges, dating from the time of the Han dynasty (202 B. C. to 220 A. D.), furnish striking evidence of the early acquaintance of the Chinese with engineering science. According to the historical and geographical writers of China, it was Shang Lieng, the commander of the army under Kaen Tsu, who undertook the construction of the roads in the province of Shense, to the west of the capital, the high mountains and deep gorges of which made communication difficult, and which could be reached only by circuitous routes. At the head of an army of 10,000 workmen, Shang Lieng cut through mountains and filled up the valleys with the soil obtained from the excavations. Where, however, this was not sufficient to raise a road high enough, he built bridges resting upon abutments or projections. At other places, where the mountains were separated by deep gorges, he carried out a plan of throwing suspension bridges stretching from one slope to the other. These bridges, appropriately called by Chinese writers "flying" bridges, are sometimes so high as to inspire those who cross them with fear. At the present day there is still a bridge in existence in Shense, 400 feet long, which stretches across a gorge of immense depth. Most of the bridges are only wide enough to allow of the passage of two mounted men, railings on both sides serving for the protection of travelers. It is not improbable that the missionaries who first reported on Chinese bridges two centuries ago gave the initiative to the construction of suspension bridges in the West.

THE USUAL BRAND-NEW SCHEME for utilizing the water-power of the Niagara river is again projected. This time it takes the form of an immense tail-race to be dug parallel to the river for 15 miles, with numerous cross canals or head races running from the river, each one furnishing one or more turbines which will drive dynamos to furnish electric power. It is proposed to excavate the tail-race by hydraulic power, on the same principle that hydraulic mining is done in the West.

THE NEW COG-WHEEL RAILWAY up Mount Pilatus in Switzerland has recently been opened and is said to be one of the most remarkable feats of modern engineering. The elevation attained is 6724 feet, and the roadbed is of solid masonry, the rails being bolted fast into it with heavy irons. The rack in the center has a double row of cogs cut in solid steel, and it is absolutely impossible that any accident should occur. The speed attained is 200 feet per minute.

AN UNDERGROUND MOUNTAIN RAILWAY.—M. Wautweller, a Swiss engineer, has applied for a concession for an underground railway up the Jungfrau mountain. He proposes to reach the summit of the mountain by means of a tubular tunnel. The Eiffel tower as a curiosity will have to take a second place should the scheme be successfully carried out.

MINUTE CIRCULAR SAWS.—The smallest circular saw in practical use is a tiny disc about the size of a shilling, which is employed for cutting the slits in gold pens. These saws are as thick as ordinary paper, and revolve some 4000 times per minute. Their high velocity keeps them rigid, notwithstanding their extreme thinness.

UTILIZING THE FORCE OF THE WAVES.—A pump worked by wave-power supplies salt water from the ocean to sprinkle the streets of Ocean Grove, N. J. The waves push backward and forward a swinging door connected with the piston, thus lifting the water.

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Business Announcements.

[NEW THIS ISSUE.]
Delinquent Sale Notice—Gray Eagle M. Co.
Flax Packing—W. T. Y. Schenck.
Sheathing Lath—John F. Byxbee.
New Books—Henry Carey Baird, Philadelphia, Pa.
☞ *See Advertising Columns.*

Passing Events.

There have been heavy rains all over this State during the week, which are advantageous to the miners and farmers. A good, steady water supply is apparently insured for all the mills.

The Lead Convention began its deliberations at Salt Lake this week. It is expected that this meeting of the lead miners of the country will have the effect of forcibly calling the attention of Congress to the injustice being done in the prevailing system of free importation of foreign lead ores.

The California delegates to the Silver Convention at St. Louis have left for that city. Silver is gradually rising in price and the silver miners of the country are now more hopeful than for years past. A lessening of the discount would have the effect of starting up hundreds of idle silver mines.

A consultation of prominent mine-owners was held this week at Virginia City, regarding the proposed plan of draining the South end Comstock mines for the purpose of resuming operations in the lower levels. With this work carried on, many more men would be employed than is the case at present.

The Supreme Court has decided that incorporated mining companies cannot deviate from the law requiring them to post or publish statements of their affairs on or before the 15th of each month.

The Silver Question Not Complex.

The National Grange honored itself in passing a resolution favoring the free coinage of silver, rightly claiming that the depreciation in the market value of the metal has caused a corresponding decline in the leading farm products of this country. This action of the Grange, representing as it does the different States, in the leading industry of the country, is in keeping with the policy of this paper as set forth in previous issues on the silver question, which is far from being, after all, so complex as many superficial thinkers, journalistic writers, as well as others, assume. While it is true that many propositions are offered and are involved in the so-called problem, it is likewise true that they can be aggregated and thus sifted and simplified.

Free coinage is, of course, a very easy process of adoption, but to the more conservative advocates of the rehabilitation of silver, this seems too sudden and radical for the present moment. These, so far as ascertainable, favor an increase in the monthly minimum of coinage to $4,000,000 a month, or $48,000,000 a year. They claim that allowing for the steady and increasing consumption of the metal in mechanics, arts and sciences, a yearly demand will then exist that will insure such an enlarged market as to surely enhance the price under the immutable law of supply and demand.

Now as to the silver note. This has proven a pronounced success and has entirely overcome the "gold-bug" objection that the silver coin is too cumbersome, and also has given to the United States a paper currency such as is not possessed by any other nation; that is, a paper money based, not on a promise to pay, but on an actual fact—a dollar in paper money absolutely secured by a dollar in coin; a dollar, no matter what its commercial value in bullion, is a one-hundred-cent dollar to all intents and purposes in the channels and marts of trade in the United States, and which, in the event of any great social or political convulsion, would assert itself as a real and actual money, preferable in all climes and by all nations to any monetary representative that is a mere *fiat*, and not only at par but at a premium.

A late rumor telegraphed from the East is to the effect that Secretary Windom intends to formulate for the consideration of Congress a plan for the purchase of silver bullion by the Government and the issuance against such bullion of notes or certificates whose value shall be based on the market value of the bullion. This is impracticable and presents the only real complication in the subject. Its tendency would be to make the note of issue simply a commercial commodity, and that is exactly what the advocates of silver wish to avoid. They want silver recognized as money, and paper issued against it to be money currency and not a mere warehouse certificate with a changeable value.

In connection with the above, we take the following from a late issue of the *Silver Dollar:*

Following the demonetization of silver in the United States in 1873 came the great panic of that year, which brought about widespread ruin. Not again until 1879 did prosperity begin to dawn upon the country. In 1878 we again began the coinage of silver under the Bland bill, which compelled the Government to coin $2,000,000 per month, and permitted any amount above that up to $4,000,000 per month. But strange as it may appear, every Secretary of the Treasury, from 1878 to the present hour, has refused to coin over $2,000,000 per month, and every President, whether Democrat or Republican, has held the mints to limited coinage. With that, however, we have kept even with the contraction of the National Bank notes, and have added a few millions to our circulating medium, merely enough to have kept a great financial panic off of the commercial world. But as the nation has grown, as population has increased, the money volume of the country has grown smaller and smaller per capita until now business is in a measure paralyzed for want of money, and we are again going on into a panic in 1891—*unless* silver is remonetized and the mints thrown open again to free and unlimited coinage.

A HEAVY JUDGMENT.—The chancery suit of M. R. W. Bark et al. vs. Robert H. Hopper, at Hillsboro, Sierra county, N. M., has just been decided in favor of the latter, who secures judgment for $55,000. In addition to the matter of accounting growing out of the mining, shipping and treating of the ore from the Virginia mine, much of the investigation was given to questions of scientific mining. An Edison phonograph was used in taking testimony.

Alaska Lead and Silver.

Reports have recently come to hand from one of the most distant mining districts in the northwestern section of Alaska Territory, known as Fish River mining district. By the arrival in San Francisco within the last fortnight of Mr. J. C. Green from Golovine Bay, Alaska, the latest news is received concerning the mines in Fish River district. Mr. Green informs us that the tunnel started last fall on the Pioneer claim is now in 250 feet, with good indications of tapping the ore body soon, the croppings of which are just above the face of the tunnel. Air is reported bad, however, and the night shift will not be worked on the tunnel until next spring, when air appliances will be sent up. On the Omilak claim, which adjoins the Pioneer on the north, work has been carried on on a small scale by running open cuts wherever the ore body lay, covering a large area of surface. Considerable ore was extracted from these cuts, all of which yielded good returns. Some 82,000 and odd pounds of this ore shipped to and recently sampled by Prof. Thos. Price & Son yielded 142 ounces per ton in silver and 74 per cent in lead; 26,000 pounds of chlorides from the dumps yielded 128 ounces per ton in silver and 61 per cent in lead, carrying some gold. A lot of red, yellow and gray carbonates shipped from the same mine ran much higher than this.

Mr. Green speaks highly of these properties and considers the district one of great importance and thinks it destined to outrival the famous Galena Mines of Leadville, Colorado, in its output of ore.

But little prospecting has as yet been done in this district by outside parties, or rather parties of and under the employ of the Omilak Gold and Silver Mining Company, of which Mr. Green is manager. Some placer gold has been found, but to no great extent and certainly not of sufficient importance to cause an excitement. Mr. Green is of the opinion that this section of Alaska is chiefly a silver and lead district. All the silver lodes thus far located are in limestone formation in contact with slate.

Riches From an Old Mine.

When two men can take out $100,000 in less than a year from a quartz mine, they are doing a pretty good business. Yet this is what two young men, Messrs. Grant and Appel, have done in the Chipps Flat pocket mine, between Moore's Flat, Nevada county, and Allegheny, Sierra county. And they have no mill, either, simply pounding the rich rock up in a mortar by hand.

This mine was abandoned over 20 years ago, and lay idle until these men took hold of it. They ran about 20 feet further in the old tunnel and struck it rich. Since then they have made a number of bullion shipments, the last bar weighing 125 pounds.

Should we read of an occurrence of this sort in a distant region, hundreds of men would be anxious to go to a locality so favored. Yet here it has attracted no special attention. The same may be said of the Bonanza claim, a pocket mine in Tuolumne county, which has yielded very largely of late. In pocket mining there are great chances to be taken, of course, but if the chance is a lucky one there is great reward for labor. Doubtless many others of the abandoned mines in the older districts of the State will be worked again in course of time, when people come to a realizing sense of their good fortune in living in a region where there are such golden possibilities. Sierra and Tuolumne are not the only mountain counties where there are opportunities for energetic and persevering men in quartz mining.

A NEW ARIZONA RAILROAD.—"Diamond Joe Reynolds" has arrived in Phœnix, A. T., with other gentlemen interested in the construction of the North and South railroad through Central Arizona, between Phœnix and Prescott. It is understood that arrangements will be entered into at once for the construction of the road, and it is anticipated that work will be begun December 1st on the construction of this important line which opens up one of the richest and most extensive mining regions on the Pacific Coast.

IT is estimated that 250,000 persons in the United States are engaged in business depending solely on electricity.

Cable and Electric Street Cars.

It may surprise many who suppose electricity to be the coming motor for street-railway traffic to learn that it has been decided to put a cable railroad on Broadway, New York, the most important thoroughfare in the United States. The road will run from South Ferry to Fifty-ninth street. There are already four miles of cable railroad in operation in New York, where it has proven successful, as it has in every place it has been introduced.

In this city and elsewhere the cable roads have practically built up the streets where they were operated. In Broadway the case is different, for that street is already a highly important one and the cable road is merely an adjunct displacing the horse-cars. That such a road is to be built on this thoroughfare proves the estimation in which the cable system is held and the position into which it has forced itself by its practical advantages. It is a great hit for the cable system to be adopted on that street after the popular feeling in the country that electricity is the coming power.

Moreover, the only electric street road in New York—the Fourth Avenue Storage R. R.—closed down its electric plant on the 26th of last month. This road has 120 cars all run by horses, except six or eight, which were run by electricity, on the storage system. Now these electric cars have been discontinued and are running by horse-power. The electric cars have been running about a year and a half, so there has been plenty of time to prove their practicability, but the company has gone back to the use of horses.

Our experience with electric railroads in California has not been favorable; the San Jose, Los Angeles, San Diego and Sacramento roads, on different systems, having all been failures, in one way or another, and none of them are now in operation. Yet we hear of them being successful in other places, though it is difficult to get reliable information as to power used, etc. The impressions conveyed concerning many of these roads are misleading, as is shown by closer investigation. For instance, many persons believe that the great West End Co. of Boston, a consolidation of all the lines, with 1100 street cars, is an electric road. This is not the case, however, the company having only 50 electric motors out of its whole number of cars.

We have no electric roads in operation in San Francisco or in California. The cable system has proven perfect with us. In addition to the older lines in San Francisco, new ones are being built, and more are projected. The builders are men of experience and wealth, who have investigated all the systems, and they continue constructing new roads on the cable transmission plan.

DELEGATES TO THE SILVER CONVENTION.—The delegates from California to the St. Louis Silver Convention left here on Wednesday. They are Frank Pixley, Charles L. Ackerman, Edward Curtis, Robert McCeney, Homer L. King, James A. Johnson, David Jacks, A. V. Butler, Henry Lindley, John Bidwell, James A. McCudden, Asa Ellis, Herbert C. Nash, D Earnest Melliss, C. T. Summers and C. O. Ziegenfuss. The delegates will be given a reception at Denver by the Chamber of Commerce of that city. It seems too bad that Governor Waterman did not appoint at least one bona-fide mining man as a delegate. The nearest to it he got is Homer King of the Stock Exchange.

INFRINGEMENT OF PATENT.—The Reagan Vapor Co. has begun an action in the U. S. Circuit Court against Mora M. Barrett, John Daly and W. A. Cavanaugh to recover $20,000 damages, also to enjoin the defendants from using a certain patent of a gas engine, letters patent of which were secured by D. S. Reagan. The defendants conduct business under the name of the Pacific Gas Engine Co., and the complaint charges them with infringement of the Reagan patent.

A CAVE occurred at the Equator mine, about five miles south of Placerville, on Sunday, wherein William Bolander was killed and three other workmen narrowly escaped with their lives.

NAME WANTED.—If the person who mailed us a postal note without any letter from Auburn, on the 7th inst., will send us his name, he will receive proper credit on our books.

Tombstone, Arizona.

Water Supply of a Mining Town.

(From Our Own Correspondent.)

EDITORS PRESS:—Not intending to abandon the plan of writing up every point of interest visited by your correspondent and traveling agent during his five months' ride over the biggest portion of Arizona, I send you a brief description of Tombstone, and especially of her superb water supply.

Like everybody else, I had formed an idea of the kind of town and mining camp Tombstone might be, judging from meager descriptive hints found occasionally in some newspapers. This being my first visit here, I am really agreeably surprised to find Tombstone such an orderly, well organized and nicely laid-out city of nearly 3000 inhabitants—a strictly American town, built upon a gently sloping plateau girded to the south by a group of hills and about eight miles east from the San Pedro river. The streets are wide, running from north to south and east to west, crossing at right angles between blocks of 360 feet in length and same width, of mostly one-story buildings, many of which are built of adobe, especially the business houses. Several of these buildings are covered with mastic and are decorated, giving them the appearance of stone structures.

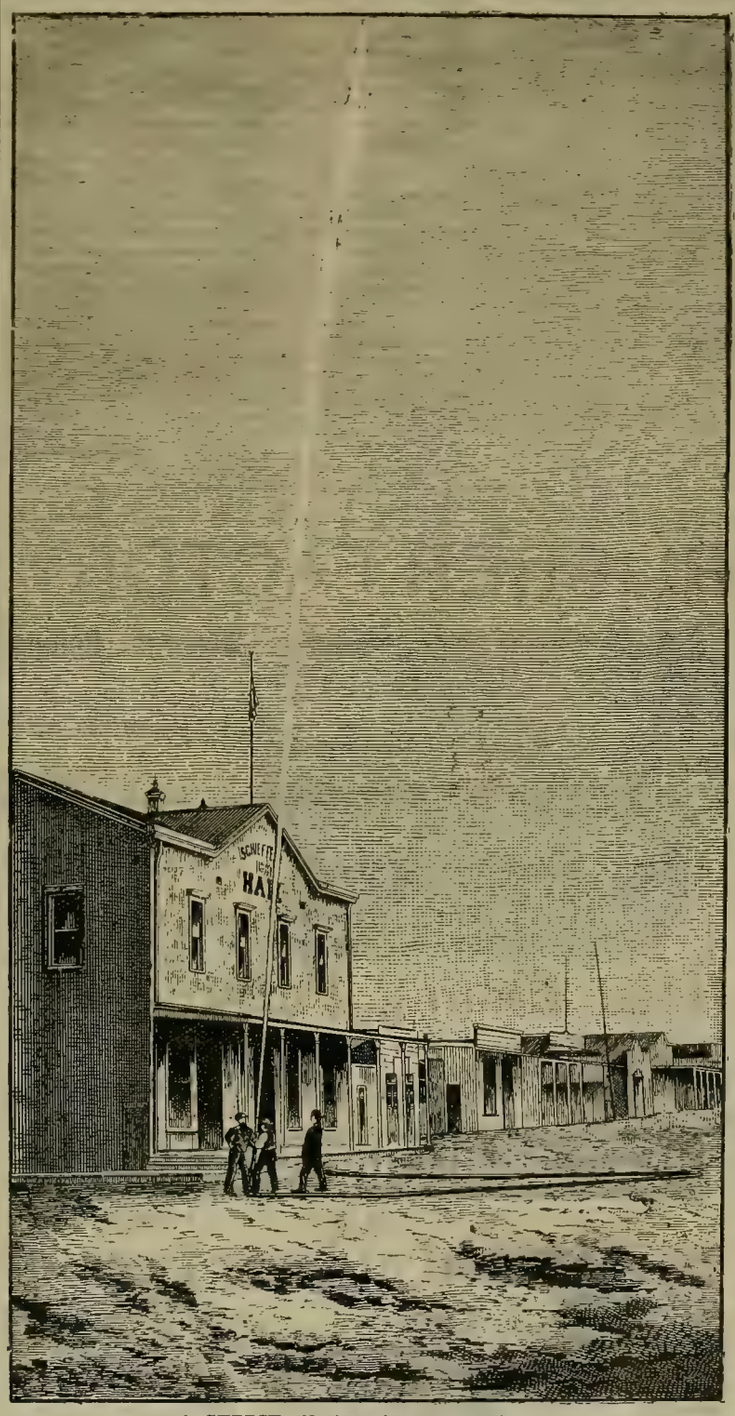
Among the dwelling-houses, which are mostly built of lumber, are numbers of cosy cottages, well shaded by cottonwood trees, and often hidden from view by a luxuriant growth of shrubbery, decorative plants and flowers. In the beginning of November I find in many front yards all the popular varieties of garden plants in full bloom, including morning-glories, honeysuckles, tulips, geraniums, hyacinths, dahlias, asters, fuchsias, and scores more, and this at an altitude of 4600 feet above sea-level. The business portion of Tombstone includes not less than 20 blocks, and every branch of business is well represented. The merchants carry large stocks of goods, and trade seems to be brisk, in spite of dull times in general. The inhabitants are, without exception, as far as I could see, a healthy and hardy set of people, the climate being actually as perfect as could be wished for. I find an excellent public school, a fine county court-house, city hall, Masonic hall, named after the pioneer prospector, Schieffelin, four churches, gas factory, foundry, ice factory, Turner hall and skating rink. The following fraternal organizations have flourishing Lodges here: The Masons, Odd Fellows, Knights of Pythias, Grand Army of the Republic, United Workmen, Daughters of Rebekah, and Patriotic Order Sons of America.

Perhaps the most noteworthy fact in connection with Tombstone as a town is the water supply. Situated in a dry country where springs are miles apart, the city is furnished with as pure, excellent water as any town in the United States. The city water works and the Sycamore Spring Water Company both furnish good and sufficient water for domestic purposes. The latter company has a pipe-line eight miles long that conducts the water from the Sycamore springs, near the base of the Dragoon mountains. The Huachuca Water Company, an Eastern corporation, has expended $500,000 in bringing water to Tombstone from the loftiest range of mountains in this vicinity, the Huachucas, a distance of 31 miles. At the mountains is a reservoir holding a million gallons. The pipe leading to the city has a capacity of 45,000 gallons per hour. At the lowest point, where this pipe crosses the valley of the San Pedro, it is subjected to a pressure of 1900 feet. The Tombstone reservoir, with a capacity of 1,200,000 gallons, is 360 feet above the city, and 1100 feet below the level of the mountain reservoir. The pipes lead to all parts of the town. For fire purposes it has a pressure of 160 pounds to the square inch—greater than that of the best fire engine.

The great fires of June, 1881, and May, 1882, which in the aggregate destroyed a million dollars' worth of property, and for the time being seriously crippled the young city, would, with the Huachuca water, have been impossible. Fire now attacking a pitch-pine building is unable to consume it, and when doing its best is compelled to leave the charred framework. Thirty-eight fire-plugs are well distributed throughout the city, and the fire department, with four hose-carts, 2000 feet of 2½ inch four-ply rubber hose and one hook and ladder truck, is a safeguard that makes any conflagration an utter impossibility. An exhibition under disadvantages, a heavy west wind blowing at the time, afforded your correspondent an opportunity to see for himself the tremendous force of the water. From a 1¼-inch nozzle a stream of water was thrown fully 60 feet perpendicular up in the air, and what it will do when calm the accompanying photograph (see engraving) will show and explain for itself. The building near by where the stream of water is shown is the Schieffelin hall, and measures 51 feet in hight from the sidewalk to the top of the flag-pole.

Tombstone has gained her world-wide reputation through the great number of rich silver mines that have been discovered within the last twelve years. Millions of dollars have been produced by them during that period, and millions of dollars have been invested in costly machinery, hoisting works, substantial buildings, mills, etc. Water in large quantities was encountered as depth was attained, and two large and expensive Cornish pumps were put in the Contention and Grand Central mines respectively, which combined were able to manage the water.

Unfortunately, the Grand Central buil lings



A SKETCH IN TOMBSTONE, ARIZONA.

and works burned down a few years ago, also wrecking the shaft, and to rebuild requires an outlay of a great sum of money. The different companies cannot agree on sharing the expense of renewed action, and consequently several of the largest mines are lying idle, although every one of them is in large bodies of good ore. But the time will undoubtedly come when some understanding will be arrived at, new pumps erected, the water raised, and a never-ceasing stream of bullion flow from the famous district of Tombstone. At this day there are about 250 men employed by several of the companies, each of which owns a number of mines, while about 200 more miners are chloriding in the neighboring camps.

Much of the work going on is of a development character, and as soon as operations should assume their proper dimensions—that is, their former scale—the population of Tombstone would double at once and reach its former number of over 6000. JULES BAUMANN.

Colorado's Silver Convention.

At the recent silver convention in Colorado a permanent organization was perfected, with Hon. H. A. Tabor as president and a vice-president from each county in the State. Resolutions were passed strongly urging remonetization. The preamble preceding the resolutions states that it is the opinion of the people that the demonetization of silver 16 years ago by this country and foreign powers was the result of a conspiracy of the few against the many, of the creditor class against the debtor class, of the consumers against the producers, of the idlers against the workers; that since the time mentioned the period has been marked by constantly declining prices of staple commodities and of all the products of the farm and shop, and also taking from the producers 30 per cent of their gross productions; that this condition of things has now been definitely traced by the most careful and reliable observers of the world to the destruction of more than one-half its standard money, thereby increasing the use of and demand for gold; that efforts to remedy this ill-timed action have been met with predictions of evil to the people and to the nation. The declarations are in substance that the time has fully come when a restoration must be made, and that this can only be done by restoring the system of metal money coinage in effect prior to 1878, which in the past has proved so beneficial. That Congress, upon assembling, pass an Act for the remonetization of silver and for the free and unlimited coinage of the same. That until such time, a demand is made for the coinage of $4,000,000 per month, in accordance with the Bland bill. That the time has arrived when the United States can lead the way in the matter of free and unlimited coinage, and that by so doing it will increase the prosperity of its people. That the present stringency of the money market, in connection with the low price for all the products of labor, is convincing evidence that the money volume has not expanded with the increase in population. That the people generally insist upon the enforcement of these last demands.

The Nationalization of Industry.

It is but little more than a year since Edward Bellamy gave the world "Looking Backward," a work in which the nationalization of industry is so attractively put as to lure many adherents. Numerous clubs have been formed for the realization of this idea. Now what are we to understand by this phrase? "The simplest definition of this new term, Nationalism," says Lawrence Gronbound, one of the leaders of the movement, "is National control of all industrial forces." It is that form of socialism that aims to put under State control every form of industrial activity, and make all workers, whether by hand or head, the salaried employes of the Government. The friends of this movement would have the Nation own everything, all the land and all the property of every name and description. It should excavate all the mines, operate all factories, mills, machine-shops, build all the houses, raise all the corn, wheat, oats and barley, breed all the horses, cattle, sheep and hogs; bake all the bread, make all the hats, boots, shoes, clothes, and compound and dose out all the medicine. In short, the Government would be the exclusive landlord and employer, and all the people equally dependent upon its care and protection. This is Nationalism, and its aim is to destroy the whole competitive system of labor and enterprise as the source of all our social ills and financial trouble.

But however spruce and attractive this form of socialism may seem in its new dress, there is very much about it that is decidedly objectionable. Of all the forms of despotism that the imagination of man ever devised, this would be the most intolerable. The effect of it would be to place the whole industrial activity of the people under a uniform drill and control, like an army in which the will, volition and liberty of the individual would be drowned and lost. It would tend to produce idleness, indifference, a disposition to shirk, and destroy all accumulations of property beyond what was needed for daily sustenance, by taking away all the incentives to industry and economy. It would swallow up all enterprise, adventure, all heroic energy, originality, inventive genius and individuality in one vast dead sea of sluggish uniformity. It would level society downward, not upward. This is obvious; for in order to prevent those social inequalities that are regarded as offensive to these easy-chair philosophers, some way would have to be devised to hold back the energetic, the industrious, the men of superior ability and daring adventure. For it would not do to let them acquire and enjoy more than the weakest and dullest, the indolent and improvident. That would let the old order of things back again. Hence the capacity of the lowest would become the standard of equality. Would not this be putting the brakes upon progress? Would it not be taking the advice of Rousseau, who long ago thought the best thing society could do would be to burn the Patent Office and get into a covered wagon and move back to the woods?

But while there is much in this Nationalist movement, taken in its entirety, that we cannot accept, there is much that is desirable and should be encouraged. Modern life demands organized business action, and it is becoming daily more clear that many forms of business can no longer be safe in private hands. The sooner we meet this matter face to face the better. America is now the only important country where the telegraph exists under private management. State railroads have become almost universal in Central Europe. The municipalities of those lands have very generally assumed the control of gas works and water works. It is the proper function of government to assume the ownership of all industrial monopolies, upon which the vital welfare of the people and prosperity of the public depends, but when it is contended that government should manufacture everything, from a gang-plow down to tidies and night-shirts, it is running a good idea into the ground.

ENGLISH MINES.—Great Britain mined almost 10,000,000 more tons of coal, iron and other minerals last year than in 1887, and employed 10,000 more men in the work, but fewer lives were lost in the process. The total number of accidents was 885, and of deaths occasioned thereby 860, being an increase of four in the accidents, but a decrease of 91 in the lives lost.

THE Drumlummon mine, Montana, made last month an output of $87,200 from 6798 tons of ore crushed. The working expenses were $56,000.

Artesian Wells in California—No. 3.

(*Continued from page 393.*)

the portion of the water issuing from the mountains, the rest passing directly to the sea.

"The Santa Ana river issues from its canyon about 12 miles above Victoria Cienega; by barometric measurement it descends about 700 feet in that distance, while Mill creek issues several hundred feet higher still. The water absorbed by the gravel masses, and afterward confined between successive clay-sheets, might, at the cienega in a well 200 feet deep, be under nearly a thousand feet pressure. No such degree of pressure can, however, manifest itself, because of the enormous friction opposed to any movement, and doubtless because of a steady, though slow, seepage toward the sea, which relieves it below."

It is impossible for me, within the limited time allotted for this paper, to enter into a full exhibit of the results of all borings in this State; and I desire to add but a few words more with reference to wells from which water is raised by pumping.

So clearly has the utility of judicious irrigation in the vineyard, orchard, garden and field been established, that we find within two miles of Florin, on the firm red clay upland, over 500 windmills drawing water from depths of 35 to 100 feet, costing in the aggregate more than $50,000, irrigating not to exceed five acres apiece at a first cost of $20 per acre, besides annual cost of repairs.

Within the same radius are four steam-pumps elevating water from pits, to the bottom of which water rises from wells about 80 feet in depth. One of these, a centrifugal pump, has been placed in a pit 20 feet square, 20 feet deep, from which three tunnels, each 12 feet long and eight feet high, are chambered into as many bedrock sides of the pit.

This pump is placed at the water-table 10 feet below the surface of the ground, and has a capacity for supplying water to about 200 acres of land. Eleven borings, of which 10 are four inches in diameter and one is 10 inches, bring water into the pit from below.

These wells become flowing wells when the water-table is lowered by pumping. The capacity of the pump is in excess of that of the wells after the surface of the water is lowered about 10 feet.

On the ranch of R. D. Stevens, about eight miles from Sacramento, on American river, vines are irrigated in June or early in July by flooding, water being raised from a gravel stratum by means of a bored well, 33 inches in diameter, 86 feet deep, to within 11 feet of the ground's surface. When pumping, the water-surface is lowered about six to eight feet.

The circular well, 18 feet in diameter, 25 feet deep, with brick casing, from which R. B. Blowers at Woodland, pumps water for irrigation by flooding, of alfalfa lands, orchard, vineyard, etc., is known to most of my hearers from the many descriptions of the same which have been heretofore published.

Many other such irrigations might be noted, and all bear testimony to a healthful development of our resources, to the onward march of civilization, and to the advancement of agricultural pursuits, from wheat-growing to a more intense cultivation of our fertile lands, which will ever remain the pride and boast of our State.

Famous among deep borings in other countries, is the artesian well of strong flow at Grenelle, in Paris, which is about 1900 feet in depth, and which was bored in the years 1834 to 1841. Its diameter is 16 inches. The well at Passy, in Paris, was undertaken 14 years later, and was completed in 1857. It is reported to have a discharge of over 5,000,000 gallons per 24 hours, from a depth of 1923 feet, and has at the bottom a diameter of no less than two feet four inches.

At La Chapelle, in France, from 1866 to 1869, a boring five and one-half feet in diameter was carried to a depth of 1811 feet. The boring-tool had a weight of four tons and was dropped 25 times per minute. It was the intention to continue the boring to 2950 feet.

There are many other deep borings in Paris, most of which are from two to eight inches in diameter.

In England, where artesian wells are also numerous, they are generally known as "blow-wells."

By reason of the immense number of wells that have been bored in the London district, the hight to which water there rises has been measurably reduced, and many wells which were once artesian have now ceased to flow.

At Kissingen, in Germany, water is thrown up to a hight of 58 feet from a depth of 1878 feet. It is claimed that, in this case, the impelling force is due to carbonic acid gas, generated at a depth of 1680 feet, at a junction of gypsum with magnesian limestone.

The deepest boring in the world is at Sperenberg, about 20 miles from Berlin, where a well penetrates the crust of the earth to a depth of 4197 feet. This depth was reached with a bore-hole 13 inches in diameter, which, in the last 3907 feet, penetrated a deposit of salt. The artesian well at Charleston, S. C., delivers about 29,000 gallons of water per 24 hours at 10 feet above the surface of the ground. Much difficulty was experienced in completing this boring to a depth of 1250 feet, as also one at New Orleans, only 600 feet deep, on account of light sands that had to be penetrated and frequent lateral displacement of the well-tubing. The boring at New Orleans did not strike any water of spontaneous flow.

At St. Louis, at the Asylum for the Insane, a boring stopped at 3843 feet in 1868, brought up only brine. The last 40 feet were in granite.

The well at Louisville, in Kentucky, bored in 1857, had been more successful. It reached a depth of 2086 feet, and brought up a copious supply of good water.

In Mississippi, at the base of the hill on which Columbus is built, a nine-inch well struck a flow which was reported strong enough to run a mill. As soon as this well was opened, the many artesian wells in Columbus ceased flowing. They commenced to discharge water again as soon as the new well was partially closed.

The well at Louisville, Kentucky, is 2066 feet deep, and brings up water decidedly mineral in character.

A recent deep boring in Europe is the well of Buda-Pesth, Hungary, which was commenced in 1868 and completed in 1879. It was bored to a depth of 3200 feet, and delivers about 167,000 gallons of water per day.

The water, which has a temperature of 165 deg. Farenheit, contains small amounts of carbonic acid, nitrogen and sulphuretted hydrogen.

The temperature of the mud taken from the well at 3000 feet was 177 degrees. Before the bore-hole was lined with wooden tubes, its flow was 272,000 gallons per day.

By means of such deep borings, as here enumerated, great treasures of gas, of oil, of coal, of salt, and of water, have been developed in many localities of the United States, as well as in other countries; and it goes without saying that many a discovery remains yet to be made, and many a reward awaits the persistent exploration with the auger throughout the length and breadth of California.

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Thanksgiving Day.

Before the next issue of the PRESS, the day annually set apart by Presidential and Gubernatorial proclamation for public thanksgiving will have come and gone. From the Atlantic to the Pacific, from mountain and dale, western prairies and southern savannahs, more than 60,000,000 people have been invited to gather around their family altars or into their respective places of worship and gratefully acknowledge their dependence upon the Giver of all good. It is true this day has come to be regarded as more gastronomic than devotional. Many think more of roast turkey, cranberry sauce, mince pies and plum-puddings, than of anthems, prayers and sermons. Perhaps no better reform could happen to us than a revival of the old-fashioned idea of thanksgiving. The day was born of a deep, sincere religious feeling, and what can be more fit and beautiful than for so great and highly enlightened a people, favored as no nation was ever favored, once a year at least devoting their thought to the recognition of the infinite power that built the world and sends the rain and sunshine upon the just and the unjust.

What if the year has been marked, as it has, by unusual calamity? Thriving towns and thousands of lives have been destroyed by floods, fires have desolated cities, there have been storms and cyclones, and the drought has smitten the hope of the garden and field in some parts of the country. Still, we should cherish the assurance that the highest wisdom and goodness guides the world, and feel it to be our duty to equally remember that Power in our adversities as well as our prosperities.

It is evident at a glance that as a nation we have much to feel grateful for. During the past year we have seen four new stars added to our galaxy of States. Peace reigns throughout our borders. No foreign foe menaces our shores. If we turn our eyes to the most favored lands, the contrast should inspire us with the most grateful emotions. We see the governments of the Old World propped by bayonets and buttressed by cannon. Alarm dwells in the palaces. Fear, like a bloody phantom, haunts the thrones. In South America, Brazil, with its nineteen provinces, and territory quite equal to the United States, has just cast aside monarchy as easily and indifferently as a man throws away an old coat and gets himself measured for another. But amid all these changes, these spectral portents in the air, the population of these States are preserved in peace and happiness, not by standing armies and navies, not by the policeman's club and the fear of the law, but because the people are animated and harmonized by a common spirit of patriotism, love of home and social order.

The farmer especially has reason to cherish a grateful heart. Agriculture underlies all our national wealth. He gives the nation bread. But we have become so accustomed to our phenomenal crops, the immense statistical reports of the wealth of our soil, mines and seas, that we are no longer astonished when we are told that the agricultural productions of the current year have been appraised at four hundred and a half millions of dollars. Our national wealth in 1880 was estimated at forty-four thousand millions of dollars, exceeding the wealth of Great Britain by two hundred and seventy-six millions of dollars. England's wealth is the result of the slow growth of centuries; the wealth of the United States has mostly been made during the last 25 years. Surely these great facts, not to go further into detail, should justify the President in calling upon us as a people to come around our altars with praise and thanksgiving.

But let us come closer home. That is a very poor idea of Thanksgiving that vanishes with the choice viands of the table. To many the day does not come with smiles and gladness. Some are pale and worn with disease. Some are shivering in the byways and alleys of neglect. In some homes there are empty garments and vacant chairs. It may be that the most of us may feel that we have been misunderstood, have been strangely unfortunate and made a failure of our life, but a true retrospect should be taken from a higher and more comprehensive point of view. In doing so we shall most likely see that all the trials, incidents and vicissitudes of the individual or family are the stray fragments of a song that will one day reveal its perfect harmony.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific States.

FOR WEEK ENDING NOV. 12, 1889.

414,875.—COMBINATION TOOL—Ansley & Schenck, Medical Lake, W. T.

414,964.—CARTRIDGE-LOADER—U. Bachmann, St. Helena, Cal.

414,971.—FRUIT-PITTER—G. W. Campbell, San Jose, Cal.

414,877.—FOLDING RULE—Dauchy & Roberts, San Diego, Cal.

414,704.—SIGHT-EXHIBITING MACHINE—F. Euphrat, S. F.

415,165.—ELECTRIC LOCOMOTOR—J. R. Finney, National City, Cal.

415,106.—SAW-FILING MACHINE—J. W. Green, Albina, Ogn.

414,711.—BOAT PROPELLER—B. Kenoyer, Huron, Cal.

414,885.—STATION INDICATOR—Krasky, Lommatzsch & Kuffler, S. F.

414,987.—EASEL—Laura S. McDonald, St. Helena, Cal.

414,983.—TYPE-WRITER CABINET—Gladwin & Mighell, S. F.

415,074.—FRUIT-PACKING CASE—J. L. Stevens, S. F.

The following brief list by telegraph, for Nov. 19, will appear more complete on receipt of mail advices:

California—Francisco Cavelers, assignor of one-half to F. Stork and A. S. Mackinzie, San Jose, pump; George F. Gray, San Francisco, concrete-mixing and delivery wagon; Shedrach D. Northcutt, Los Angeles, carrier track for cable curve; John P. Simmons, Los Angeles, two patents for steam boiler; John G. Stultz, San Diego, colored fire; Oliver Van Orman, assignor of one-half to C. H. Eason, Los Angeles, divided car axle.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

EASEL.—Laura S. McDonald, St. Helena, Napa county. No. 414,987. Dated Nov. 12, 1889. The invention relates to that class of easels in which a canvas-supporting rack or shelf is vertically adjusted. The invention consists in the novel general arrangement and construction of the frame of the easel, the support and guide for the moving rack or shelf, including its attached parts, the adjustable rack or shelf for the design and other details. The manner of adjusting the racks or shelves is a simple and convenient one, avoiding the complications usually present in easels of this class, for by merely loosening the thumb-screws they may be raised or lowered, and then fixed in any position.

TYPE-WRITER DROP CABINET.—James P. Mighell and Frederic E. Gladwin, S. F. No. 414,983. Dated Nov. 12, 1889. This patent covers certain details of construction in those cabinets in which type-writing machines are kept. The cabin is so made that the type-writer, when not in use, drops down into the cabinet out of sight.

CARTRIDGE-LOADING MACHINE.—Ulrich Bachmann, St. Helena. No. 414,964. Dated Nov. 12, 1889. The invention consists essentially in a rotary shell table provided with circular concentric series of holes or sockets for receiving the shells, said table being mounted in a frame and adapted to slide diametrically, whereby any of its concentric rows of holes or sockets, and any hole or socket of each row, may be brought into position. The invention further consists in the construction and arrangement of the feeding devices for supplying the shells, and the novel punch, cap-presser and rammer for decapping and recapping the shells and forcing the bullets home.

FRUIT-PITTING MACHINE.—G. W. Campbell, San Jose, assignor of one-half to Jesse Wood, Chico. No. 414,971. Dated Nov. 12, 1889. This invention relates to that class of mechanism for pitting or stoning fruit in which a reciprocating winged punch is adapted to be forced down upon the fruit so as to divide its flesh and remove its pit, the fruit being held in a suitable socketed bed below. The invention consists in a novel hinged and tilting bed for the fruit, whereby the divided fruit is discharged as the winged punch rises, the novel mechanism for operating said bed, the discharge chute and connections for receiving and guiding the fruit cut, the novel underlying knife for cutting the bottom of the fruit, the novel or removable connection of the operating-bar and winged punch-stem, and other details of construction and arrangement.

Complimentary Samples.

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News in Brief.

THE street-cars of Helena, Montana, have to be heated by stoves in winter.

ELIZABETH T. MILLS was admitted to practice law in this State by the Supreme Court at Sacramento last Monday.

THE financial results of the late fair at Portland, Oregon, are satisfactory, $20,000 being left after paying all bills.

THE Palace hotel of San Francisco will hereafter employ white men instead of colored waiters in the several dining-rooms.

DR. TYRRELL of the State Board of Health opposes immigration of consumptives to this State. He says they are a menace to the general health.

THE talk about a bridge to connect England and France is still going on. Skilled engineers report that the enterprise is feasible. The bridge will cost about $80,000,000.

A COMMITTEE from Salinas has been investigating the gas-well business in Stockton, with a view to using what knowledge could thus be gained in seeking gas at Salinas.

THE treasurer of Tehama county paid $382.30 bounty money for October. The tariff on bears is $5, while coyotes come higher—$9.50. California lions are worth $7.50 each.

G. W. LANG is to try an experiment of driving 1000 head of cattle from Tombstone to Los Angeles. He will have to cross the Colorado desert. If he can do the job, Mr. Lang will save $4000 in railroad charges.

CAPITALISTS of Troy, N. Y., are working a mining location near Steamboat Springs, Nev., at a spot selected by J. W. Norrie, the divining-rod manipulator, who claims there is a valuable ore body at a certain depth.

THE salt industry in Southern Kansas is assuming majestic proportions. It is said that the salt taken up at Wellington, in that State, is the purest in the world. A dozen great salt plants are in active operation, and others will soon be established.

THE Vallejo *Times* says the train from Vallejo Junction to Oakland mole will be run through with only one stop—at Sixteenth-street station, West Oakland—in 25 minutes. The distance is 24 miles. The old schedule time was two hours.

SOME experiments were made recently by the Northern Pacific car-builders at Tacoma to test the strength of fir and oak timber. The first-named proved one-third stronger than the Eastern oak, and more than one-half stronger than Eastern white pine.

AN attempt to enlarge the city limits of Visalia was voted down by the outsiders, a few weeks since. The insiders promptly passed an order requiring each child not in the city limits to pay $2.50 a month for the privilege of attending the town schools.

THE Union Iron Works employes are objecting to a new rule established by their employers requiring them to pay 50 cents per month into a fund to be used for defraying the expenses of surgical attendance and treatment of such as are injured while working in the establishment.

THE U. S. Railway Mail Service has inaugurated a fast mail from New York to San Francisco. The fast train arrived here Tuesday, practically gaining a full day. The new schedule gets the mail-matter into San Francisco in 108 hours, 45 minutes, and it is so arranged that it is ready for carriers to distribute the moment it reaches this city.

EGYPTIAN IRRIGATION.—E. & F. N. Spon, the New York publishers, have just issued a work on "Egyptian Irrigation," by W. Willcocks, Indian Public Works Department, Inspector of Irrigation, Egypt, with an introduction by Lieut.-Col. J. C. Ross, Inspector-General of Irrigation. This work embodies the information collected during four and a half years, of the irrigation systems of Egypt, and a *resume* of the works carried out by Sir Colin Moncrieff. From the beginning to the end of the work the author has not hesitated to impress his firm conviction that the modern system of irrigation cannot last in a country where there is no rainfall, unless it is modified by the ancient basin system. Engineering questions, such as silt-deposits, drainage, irrigation, the Barrages, flood protection, methods of regulation, locks, specifications of works, and prices of work and labor, have been treated in detail. Agricultural questions, such as amount of water needed for irrigation, duty of pumps, cost of rearing and yield of different crops, the cotton-worm, manures, and rotation of crops, are freely discussed. The Lake Moeris scheme for storing water is considered, as well as other projects for reclaiming land by basin and summer irrigation combined. The information embraced in this work is applicable to the irrigation plans and systems being carried out on this coast. The experience in Egypt must be useful to all engineers and agriculturists in this country.

LUCKLESS WILD GEESE.—During the storm last Monday night great numbers of wild geese, bewildered and attracted by the electric lights at Grass Valley, settled down in the streets and yards of the town. They were shot at incessantly, and great was the carnage until the lights were put out at midnight.

SHIPPING SULPHUR.—Alex. Wise is shipping sulphur to the Dayton Acid Works. He has contracted to ship 100 tons of refined sulphur to the works, and he has men melting the stuff at the Rabbit Hole sulphur mines, Nevada.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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CORROSION OF ZINC.—Recent experience in Germany points to the fact that under some conditions sheet zinc, when in direct contact with brickwork, suffers from rapid corrosion. It appears that in building the Berlin City market halls some sheet zinc work which rested upon brick walls was deeply pitted at a number of places, and particularly where the metal was in direct contact with the bricks. Chemical examination of these showed that they contain as high as 1.14 per cent of soluble salts, capable of producing the destructive effects noted, and stimulated to more energetic action by moisture. The proportion of such salts will vary with different kinds of bricks, and in some there may be nothing to induce such corrosion as that here noted. It would be an advisable, and, in the end, a cheap precaution to avoid immediate contact of sheet zinc and brickwork by inserting a layer of roofing-felt or similar material.

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Preface; Introduction; Implements; Assay Balance; Materials; The Assay Office; Preparation of the Ore; Weighing the Charge; Mixing and Charging; Assay Litharge; Systems of the Crucible Assay; Preliminary Assay; Dressing the Crucible Assays; Examples of Dressing; The Melting in Crucibles; Scorification; Cupellation; Weighing the Bead; Parting; Calculating the Assay; Assay of Ore Containing Coarse Metal; Assay of Roasted Ore for Solubility; To Assay a Cupel; Assay by Amalgamation; To Find the Value of a Specimen; Tests for Ores; A Few Special Minerals; Solubility of Metals; Substitutes and Expedients; Assay Tables.

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Table of Contents.

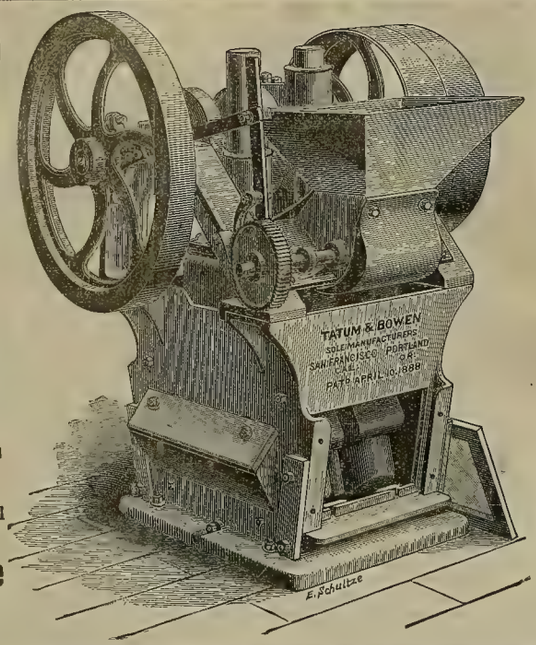
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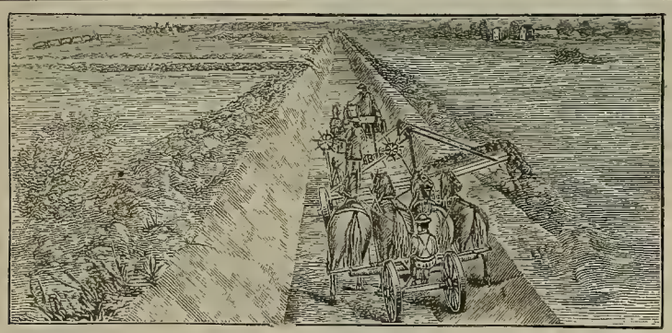
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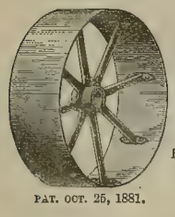


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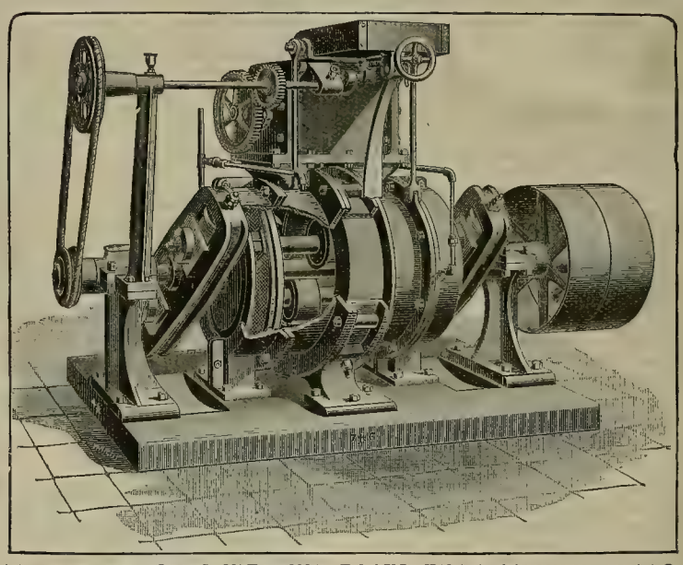
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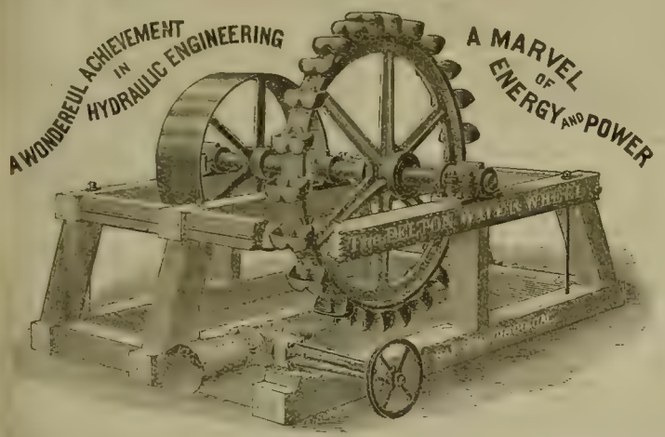
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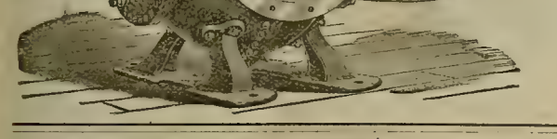
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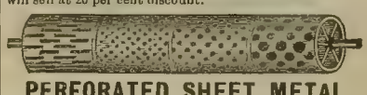
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Nov. 21, 1889.

Rains the past week have given a still more hopeful, confident feeling to general trade. With the older residents the belief is general that the crops in 1890 will be good, while the large deposit of snow on the mountain ranges insures a liberal supply of water in the mining districts. Iron-workers, machinists and manufacturers in general look forward to a more prosperous year than enjoyed for several years past. Money continues easy, with remittances from the interior increasing. The demand for accommodations is only fair.

MEXICAN DOLLARS—The market, after shading off, is showing more strength at the close, with 77½c quoted as the buying price for large quantities.

SILVER—The market remained steady in Europe at 43 13-16d, New York at 94¾c, and here at from 95¾ to 99c up to yesterday, when London suddenly jumped to 44d, New York to 95½c, and this market to 96¾@97c. To-day our market is quoted at 97@97½c, with holders asking 97½c. English advices report more active demand for bullion for the Continent and India, while in New York it is reported that shipment to Rio Janeiro is resumed. Previous to the dethronement of Dom Pedro, free shipments of silver bullion were being made to that country. Receipts of bullion in our market are still light, hardly enough to meet current requirements. Although more ore is being milled by the Comstock mines, yet the gain in silver for this market is light, owing to the Carson Mint taking quite freely.

By referring to the New York *Journal of Commerce* it will be seen that there are two quotations for silver in that market; one is for commercial bullion in bars, and the other for United States Mint bars, the latter being quoted from ¼ to 1c an ounce fine higher than the former. Our New York telegraphic quotations are for the former. Selby's refined silver bars being considered in this market finer than those of the Mint, accounts for the higher quotations we give in this city of bar silver.

QUICKSILVER—Receipts the past week aggregated 413 flasks. The market is reported strong, with a good demand ruling. In last month there was shipped East over the Southern Pacific railroad 2700 lbs.

BORAX—Receipts the past week aggregate 1080 ctls. Shipments East in the last month over the Southern Pacific railroad aggregated 9435 ctls. During the past week 374 ctls. were shipped to St. Paul, via Canadian Pacific railroad. The market is steady, at firm prices.

LIME—Receipts the past week aggregate 4247 bbls., and exports by sea 666 bbls. to Honolulu. The market is slower, owing to rains, but prices are unchanged.

LEAD—The market is slightly easier in sympathy with the East. Heavy supplies from Mexico are against the market. European advices report a weaker market under increasing supplies, with Australia an important factor to draw from.

TIN—Imports the past week aggregate 14,954 boxes of plate. The market for spot is reported firm, but for shipment is easier, owing to a lessened urgent demand abroad and more liberal offering of futures.

IRON—Imports of pig the past week aggregate as follows: From Irondale, 200 tons; Grannock, 305; New York, 100; total, 905 tons. The market is strong for spot. The above receipts are said to have been cared for before arrival. The consumption with us does not show any material increase, but the future is quite promising for a large increase. Both English and Eastern markets are reported quite active and strong.

COPPER—The market gradually shaped itself into better shape for the selling interest, and although the American mines' output show a large increase, yet values steadily advanced under a large increased consumption the world over.

COKE—Imports the past week aggregate 305 tons from England. The local market is without essential change.

COAL—Imports the past week aggregate as follows: From Nanaimo, 4144 tons; Seattle, 4100; Departure Bay, 4570; overland, 61; Newcastle, N. S. W., 1100; Tacoma, 2250; Coos Bay, 1100; New York, 105; total, 17,430. The spot market is reported fairly steady. The consumptive demand for both steam and household has been quite free. Winter setting in earlier than usual, stimulated the demand for household, and as the bulk, for several weeks at least, has been met, there is a quieter feeling. An increased output by the coast collieries is confirmed, which causes some dealers to look forward to a shading in prices, unless we have severe cold weather, in which event still higher prices may obtain.

The following are the latest comparative quotations f. o. b. at Glasgow:

	Nov. 6, '89.	Nov. 13, '89.
F. o. b. Glasgow.		
No. 1 Coltness	77s	77s 6
" Langloan	77s	77s 6
" Summerlee	77s	77s 6
" Gartsherrie	77s	77s 6
At Ardrossa.		
No. 1 Eglinton	62s 6d	65s 6
" Glengarnock	75s	76s
" Dalmellington	62s 6d	66s

Eastern Metal Markets.

By Telegraph.

NEW YORK, Nov. 21, 1889.—The following are the closing prices the past week:

	Silver in London.	New York.	Copper.	Lead.	Tin.
Thursday	43 11-16	94¾	$12 70	$3 80	$21 75
Friday	43 11-16	94¾	12 75	3 82½	21 65
Saturday	43 11-16	94¾	12 90	3 80	21 75
Monday	43 11-16	94¾	12 90	3 82½	21 70
Tuesday	43 13-16	95¼	13 00	3 82½	21 30
Wednesday	44	95¼	13 00	3 82½	21 30

NEW YORK, Nov. 20.—Tin has been gradually settling under easier markets abroad. Quicksilver holds strong. Borax is in active demand with full prices paid. Iron is still tending upward. Copper has met with a continued active movement both here and abroad. Sales are readily made at an advance of from ¼ to ¼ cent on last week's prices.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, November 21, 1889.

ANTIMONY	20 @ —
BORAX—Refined, in carload lots	7½@ 7⅝
Powdered " "	7½@ —
Concentrated " "	—@ 6¾
All grades jobbing at an advance.	
COPPER—	
Bolt	21 @ 22
Sheathing	22 @ 24
Ingot, jobbing	16 @ 18
do, wholesale	14 @ 15
Fire Box Sheets	22 @ 24
LEAD—Pig	4¾@ —
Bar	5 @ —
Sheet	7 @ —
Pipe	6 @ —
Shot, discount 10% on 500 bags Drop, ₱ bag	1 45 @ —
Buck, ₱ bag	1 65 @ —
Chilled, do	1 85 @ —
STEEL—English, ₱ lb	16 @ 20
Canton tool	9 @ 9
Black Diamond tool	9 @ 9
Pick and Hammer	8 @ 10
Machinery	4 @ 5
Toe Calk	4¼@ —
TINPLATE—E. V., steel grade, 14x20, P. S.	5 25 @ —
E. V., steel grade, 14x20, spot	5 00 @ —
Charcoal, 14x20	6 75 @ 7 00
do roofing, 14x20	5 50 @ —
do, do, 20x28	11 00 @ —
Pig tin, spot, ₱ lb	21¾@ 22½
COKE—Eng., ton, spot, in blk & sks, resptvly	16 00 @18 00
Do, do, to load	13 50 @14 50
QUICKSILVER—By the flask	48 00 @48 50
Flasks, new	— @ —
Flasks, old	35 @ —
CHROME IRON ORE, ₱ ton	10 00@— —

	Spot.	To Load.
IRON—Glengarnock ton	35 00 @— —	32½@ —
Eglinton, ton	35 00 @— —	32½@ —
American Soft, No. 1, ton	—— @35 00	32½@ —
Oregon Pig, ton	—— @35 00	— @ —
Clay Lane White	—— @28 00	26 @ —
Shotts, No. 1	35 00 @35 00	32½@ —
Bar Iron (base price) ₱ lb	— @ —	— @ —
Langloan	35 00 @— —	32½@ —
Thorncliffe	35 00 @— —	32½@ —
Gartsherrie	35 00 @— —	32½@ —

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$20 00	$17 00
41 to 50 ft	21 00	18 00
51 to 60 ft	23 00	20 00
61 to 70 ft	27 00	21 00
1x3, fencing	22 00	19 00
1x4, "	21 00	18 00
1x3, 1x4 and 1x6, odd lengths	19 00	16 00
Second quality	17 00	14 00
Selected	24 00	22 00
Clear, except for flooring	31 00	28 00
Clear for flooring	2 00	.....
Clear V. G. No. 1 flooring	6 00	.....
Firewood	14 00	10 00
Dressed Pine, flooring, No. 1, 1x6	32 00	29 00
No. 1, 1x4	34 00	30 00
No. 1, 1¼x4, 1¼x6, and odd sizes	37 00	33 00
All sizes, No. 2	27 00	24 00
Stepping, No. 1	44 00	35 00
Stepping, No. 2	34 00	25 00
Ship timber and plank, rough	27 00	18 00
Selected, planed 1 side, av'ge 40 ft	29 00	24 00
" " 2 " " "	31 00	26 00
" " 3 " " "	33 00	28 00
" " 4 " " "	35 00	30 00
Deck plank, rough, average 35 ft	35 00	32 00
Dressed, average 35 feet	40 00	35 50
Pickets, rough, B. M	20 00	16 00
½x1½, 4 ft long, ₱ M	6 50	5 00

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	7 75 @ 8 00	Cardiff	9 50@10 00
Liverpool St'm	8 50 @— —	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	9 00 @ 9 00	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Gilman	7 00
Scotch Splint	9 00	Seattle	7 00
Greta	9 00	Coos Bay	6 00
Westminster Brymbo	9 00	Cannel	12 00
Nanaimo	9 00	Egg, hard	18 00
Sydney	8 00	Cumberland, in sacks	19 00
Jackson	6 00	do, bulk	18 00

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, department 10, San Francisco:

SAN FRANCISCO ELECTRIC LIGHT AND POWER CO., Nov. 19. Capital stock, $1,000,000. Directors—Martin Bulger, Robert P. Hastings, William McMann, J. N. Chenowith, W. C. Clark, H. G. Platt and J. S. Humbird.

MUTUAL SAVINGS BANK OF SAN FRANCISCO, Nov. 19. Capital stock, $1,000,000. Directors—James Phelan, James G. Fair, Edward Barron, James Moffit and John A. Hooper.

TULARE COUNTY RAILROAD, Nov. 20. Object, to construct a railroad from Porterville, Tulare county, to the city of Tulare, making 22 miles of road. Capital stock, $220,000. Directors—P. N. Lilienthal, W. H. Chickering, Louis Sloss, Jr., and W. Thomas.

BUTTE KING M. CO., Nov. 20. Capital stock, $1,000,000. Directors—S. D. Mayer, V. I. Gadesden, Geo. H. Powers, Walter C. Lewis and L. A. Livingston.

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Germania, Nov. 13, $2973; Hanauer, 16, $6350; Germania, 16, $2211; Young America Smith, 17, $17,300; Justice, 17, $12,822; Eureka Con., 17, $14,500; Germania, 14, $2328; Hanauer, 14, $4200; Con. California and Virginia, 18, $65,379; Hale and Norcross, 19, $5000; Mt. Diablo, 19, $7243; Germania, 17, $2686.

AN IMPROVED LENS, in which the intensity of light is equal throughout the entire field and the sharpness of image distinctly uniform, has been patented by an American optician, who calls his new instrument an "electroscope."

THE Oroville *Mercury* says the manager of the Big Bend tunnel is confident that he can clear $10 a day to the man. He has great faith in the value of the property.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Belcher M Co	Nevada	13	50	Oct 17	Nov 20	Dec 11	John Crockett	327 Pine St
Calaveras Blue Gravel Co	California	4	3	Nov 15	Dec 23	Jan 14	B Burris	240 Montgomery St
Cadmus M Co	Nevada	—	20	Sept 19	Oct 31	Nov 25	J Craig	204 California St
California State Co	California	5	25	Oct 21	Nov 26	Dec 23	J O Hanscom	9 Mission St
Con Pacific M Co	California	11	10	Nov 1	Dec 5	Dec 28	F R Luty	330 Pine St
Chollar M Co	Nevada	28	50	Nov 1	Dec 4	Dec 24	C E Elliott	309 Montgomery St
Del Monte M Co	Nevada	2	20	Oct 28	Dec 3	Dec 26	J W Pew	310 Pine St
Golden Jacket M Co	Nevada	3	10	Oct 14	Nov 21	Dec 20	E G McClellan	331 Montgomery St
Gould & Curry M Co	Nevada	63	30	Oct 15	Nov 18	Dec 11	A Durbrow	309 Montgomery St
Gray Eagle M Co	California	15	6	Oct 16	Nov 18	Dec 10	J M Buffington	303 California St
Locomotive M Co	Arizona	5	5	Oct 19	Nov 25	Dec 17	A H Fish	309 Montgomery St
Lapanta Con M Co	Nevada	2	02	Oct 2	Nov 8	Dec 2	J Stadfeldt	309 Montgomery St
Mexican M Co	Alaska	4	25	Oct 11	Nov 11	Dec 2		
Navajo Queen M Co	Nevada	2	10	Oct 23	Nov 26	Dec 11	J F Holling	533 Kearny St
North Gould & Curry M Co	Nevada	11	20	Nov 6	Dec 7	Dec 27	C H Mason	331 Montgomery St
Nevada Queen M Co	Nevada	6	20	Oct 31	Dec 4	Dec 30	H Deas	309 Montgomery St
Phil Sheridan Con M Co	Nevada	4	10	Oct 22	Nov 26	Dec 11	J F Holling	533 Kearny St
Peerless M Co	Arizona	13	10	Oct 11	Nov 19	Dec 10	A Waterman	309 Montgomery St
Palisade M Co	Nevada	2	5	Nov 1	Dec 16	Jan 9	D Buck	309 Montgomery St
Platt & Gilson G M Co	California	4	3 00	Nov 13	Dec 20	Jan 6	C Herrmann	326 Kearny St
Russell Reduction & M Co	California	5	5	Nov 11	Dec 16	Jan 8	J Morizio	328 Montgomery St
Sierra Nevada	Nevada	96	50	Oct 5	Nov 8	Dec 7	E L Parker	309 Montgomery St
Seg Belcher & Mides Co	Nevada	4	25	Oct 7	Nov 4	Dec 8	E A Holmes	309 Montgomery St
Savage M Co	Nevada	74	50	Nov 5	Dec 10	Dec 30	B Holmes	309 Montgomery St
Summit G M Co	California	11	5	Nov 14	Dec 20	Jan 14	B L Burling	309 Montgomery St
Tuscarora Con M Co	Nevada	2	10	Oct 12	Nov 15	Dec 5	J J Scoville	309 Montgomery St
Trojan M Co	Nevada	13	10	Oct 23	Nov 26	Dec 11	J F Holling	533 Kearny St
Utah Con M Co	Nevada	8	25	Oct 23	Nov 26	Dec 16	A H Fish	309 Montgomery St
Union Con M Co	Nevada	39	25	Oct 8	Nov 9	Dec 13	J M Buffington	303 California St
Vine Spring M Co	California	3	15	Oct 10	Nov 11	Dec 9	F S Snell	218 Sacramento St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
California Slate Co	California	J O Hanscom	9 Mission St	Special	Nov 25
Keyes S M Co	Nevada	M P Minor	328 Montgomery St	Annual	Nov 29
Mexican M Co	Nevada	C E Elliott	309 Montgomery St	Annual	Dec 3

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	AMOUNT.	PAYABLE
Champion M Co		T Wetzel	522 Montgomery St	10	Oct 15
Caledonia M C	Nevada	A S Cheminant	328 Montgomery St	08	Aug 25
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	Sept 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	Aug 25
Idaho M Co	California		Grass Valley	5 00	Nov 7
Mt Diablo M Co	Nevada	R Heath	309 Pine St	30	Oct 25
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Nov 10

Mining Share Market.

The mining share market the past week was flat, stale and unprofitable. Since the "choking off" of the chipping fraternity by the San Francisco Stock Exchange the business transacted there appears small—less than it really is owing to the bulk of the trading being now done quietly after board and not recorded. This allows the market to be more advantageously worked up or down as required by the manipulators. While it is profitable to the latter, it is death to outside traders, and makes margin trading and short selling very risky business. Inside points continue to be put out correctly, and those who followed them lately have made money. It is only a question of time when they are led into a trap. The points are for lower prices.

In outside stocks trading continues light. Fears of more assessments on the Tuscaroras is the scarecrow in that direction, as are the Bodies, Mono and Con Pacific assessments, with others to follow on the Bodies.

The quarterly reports of the bullion-producing mines on the Comstocks are far from reassuring to stockholders. Take, for instance, that of Yellow Jacket, which is given as follows: "Produced 6321 tons of ore yielding bullion valued at $71,471.94; average yield per ton, $11.50; cost of extraction, reduction and transportation, $77,905.72; cost of production above yield, $8433.78. No tax." Reports of the pulp assays, published in the Virginia City papers, gave the pulp assays at $24 and upward a ton. Where did the balance of the bullion, over 50 per cent, go?

News from the Comstock mines continues to be kept back, probably to facilitate stock-buying by the pool. Press telegrams report that a definite compact has been entered into for draining the South End and Gold Hill mines. This will admit of active prospecting on the lower levels where rich and large bodies of high-grade ore are said to be. After getting the water out of the mines, the managers may have to make air connections and do other deadwork before exploiting for ore. On the upper levels, running from Belcher north, drifts are being run to make air connection; with this an accomplished fact the various crosscuts can be more successfully run, and the ore bodies known to lie to the west be opened up. Crown Point is crushing its ore, going a little over $16 a ton. In a short time higher grade ore will be worked. Challenge and Confidence will soon resume the shipping of ore. The storm of the past week has given all the water required for running the mills to full capacity, so that after this more ore will be milled by the ore-producing mines. The prospecting work in the North End mines continues to attract attention, as does that in the Middle and Gold Hill mines. In Alpha, on the 500-foot level they are still running west. On the 600-foot level they either have or will start crosscutting soon. The work in this mine has more than that in any other demonstrated the fallacy of the claim that the so-called syenite is the extreme limit or boundary of the ore deposit lying to the west. The discovery of well-defined veins and ore-bearing quartz in the west country rock called syenite, but closely resembling black granite, has put to rest the false idea regarding the no-ledge theory. In Alpha, on the 500-foot level, they have passed through three veins, the last being 13 feet wide—all bearing ore. It is claimed that these veins, with depth, will merge into one. The west side lode is gaining prominence, and in the near future this gold vein will be turning out bullion. The work in and around the Ward shaft continues to attract attention from experieneed miners, who look for the best of results as explorations are pushed. From the outside mines the news from the Quijotoas and Tuscaroras is of increasing interest, though it looks as if it will take three or four months before much can be accomplished.

From the Bodies the news still continues discouraging, but active work for more extensive prospecting is being done, but whether it will prove a failure remains to be seen.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 31.		WEEK ENDING Nov. 7.		WEEK ENDING Nov. 14.		WEEK ENDING Nov. 21.	
Alpha	1.25	1.50	1.30	1.50	1.35	1.55	1.35	1.40
Alta	2.05	2.40	2.10	2.25	2.15	2.30	2.10	2.15
Andes	.70	.70	.60	.70	.75	....	....	....
Belcher	2.30	2.80	2.25	2.70	2.25	2.45	2.30	2.35
Best & Belcher	2.95	3.95	3.25	3.85	3.40	3.75	3.25	3.60
Bullion	.55	.75	.60	.70	.60	.70	.60	.65
Bodie Con	.75	.85	.65	.75	.65	.75	.60	.70
Benton	....	....	3.25	3.25	3.25	....	....	....
Bulwer	.30	.35	.25	.30	.25	.30	....	.30
Commonwealth	2.80	3.05	3.00	3.10	3.05	3.20	2.95	3.05
Con. Va. & Cal	5.50	6½	5½	6½	6¼	7	6.50	6⅝
Challenge	2.10	2.50	2.00	2.50	2.05	2.10	2.05	2.30
Chollar	1.50	2.10	1.60	2.00	1.65	1.90	1.65	1.85
Confidence	6⅜	7	5½	6⅜	5⅝	5.00	....	....
Con. Imperial	.35	.45	.35	.40	.35	.35	....	....
Caledonia	.20	....	.25	....	....	....	....	....
Crown Point	2.55	3.15	2.60	3.00	2.65	2.95	2.55	2.75
Crocker	.40	....	.40	.50	.35	.40	....	....
Eureka Con	4.10	4.25	4.10	4.50	4.10	4.40	....	....
Exchequer	.55	.70	.55	.70	.65	.70	.60	....
Grand Prize	.50	.90	.80	.80	.85	....	....	.75
Gould & Curry	1.50	2.00	1.50	1.85	1.55	1.80	1.55	1.85
Hale & Norcross	2.90	3.35	2.95	3.20	3.00	3.20	3.00	3.15
Julia	....	....	.30	.45	.40	.50	.40	.45
Justice	1.45	2.00	1.70	2.00	1.65	1.80	1.60	1.75
Kentuck	1.00	1.20	1.05	1.20	1.05	....	....	....
Lady Wash	.40	....	.40	....	.40	....	.40	.45
Mono	.50	.65	.55	.65	.50	....	....	....
Mexican	3.30	4 40	3.65	4.20	3.70	4.10	3.70	4.00
Navajo	....	....	....	....	.35	....	....	....
North Belle Isle	.85	.90	.90	1.00	1.05	1.50	1.20	1.25
Nev. Queen	.55	.70	.65	.70	.75	1.00	.80	....
Occidental	1.10	1.40	1.15	1.35	1.20	1.30	1.25	1.30
Ophir	4.00	5.00	4.30	4.95	4.60	4.95	4.50	4.80
Overman	.90	1.10	.90	1.05	.95	1.05	.95	1.05
Potosi	1.50	2.10	1.07	2.05	1.75	2.00	1.50	2.00
Peerless	.25	....	.25	.30	.20	.35	.30	.35
Peer	....	....	.15	....	.15	.25	.15	....
Savage	1.50	2.10	1.45	2.00	1.55	1.75	1.50	1.65
S. B. & M	1.25	1 65	1.15	1.80	1.65	1 70	1.55	1.60
Sierra Nevada	1.60	2.15	1.70	2.20	2.50	2.70	2.55	2.85
Silver Hill	.15	.60	.55	.50	.45	.50	.40	.45
Scorpion	.20	.25	.25	....	.25	....	.25	....
Union Con	2.75	3.25	2.70	3.15	3.10	3.45	3.30	3.60
Utah	.70	.90	.80	.90	.70	.80	.65	.75
Weldon	....	....	....	....	....	....	....	....
Yellow Jacket	2.75	3.40	2.75	3.25	3.00	3.20	2.85	3.05

Sales at San Francisco Stock Exchange.

THURSDAY, Nov. 21, 9:30 A. M.

200	Mexican		3.75
150	N. Commonwealth		.95c
150	Occident		1.30
250	Ophir		4.50
100	Potosi		1.95
200	Savage		1.55
100	S. B. & M		1.55
100	Sierra Nevada		2.75
50	Silver Hill		40c
120	Utah		70c
150	Union		3.45
250	W Comstock		25c
100	Yellow Jacket		2.95

CARBON HILL COAL.—John A. Steinberg, general manager of all the Southern Pacific's mines, in speaking of the company's great Carbon Hill coal mine, 34 miles from Tacoma, said: "We are running only a light force now, on account of the large supply of coal already stored in this city. There is some $2,000,000 worth here now. About Jan. 1st we shall resume our regular shipping work of, say 1000 tons daily. Just now we are not shipping more than one-tenth that amount, confining our cargoes to those ships we have chartered. Our new system of washes for fine coal is now complete, and is very satisfactory in every way. It enhances the value of the coal fully 20 per cent by washing out all the dirt and slate. This effects quite a saving, as we formerly had to ship all the coal, dirt and slate together."

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NOTICE. There are delinquent upon the following described Stock, on account of Assessment (No 1), levied on the 16th day of October, 1889, the several amounts set opposite the names of the respective Shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't
Brown, G. A	403	300	$ 6 00
" G. A., Trustee	154	5,000	300 00
" " "	465	2,500	150 00
Bogart, O. H., Trustee	414	500	30 00
" " "	425	100	6 00
" " "	430	100	6 00
" " "	431	100	6 00
" " "	432	100	6 00
" " "	434	100	6 00
" " "	435	50	3 00
" " "	436	100	6 00
" " "	447	5,000	300 00
" " "	470	1,000	60 00
" " "	484	200	12 00
" " "	485	200	12 00
Colton, A. O., Trustee	243	100	6 00
" " "	244	100	6 00
Carnes, W. A	254	416	24 96
Chase, Q. A., Trustee	410	3,814	228 84
Deming, T. G., Trustee	231	440	26 40
Ettlinger, Isaac	137	600	36 00
Field, W. A	403	100	6 00
Frances, H. L., Trustee	444	1,500	90 00
Gray, H. W., Trustee	416	200	12 00
Horton, Thos. R., Trustee	315	5,000	300 00
Hersey, C. S	95	200	12 00
Hall, Wm. E	131	900	54 00
" " "	154	1,000	60 00
Hall, Wm. E., Trustee	411	200	12 00
" " "	412	200	12 00
Nash, H. W	269	104	6 24
Rosekrans, H. M	30	600	36 00
Riordan, Thos. D	491	12	72
" Thos. D., Trustee	415	500	30 00
" " "	416	500	30 00
" " "	417	500	30 00
" " "	418	500	30 00
" " "	492	500	30 00
Stout, C. S	486	100	6 00
" " Trustee	422	106	6 36
" " "	476	2,000	120 00
Searles, W. A., Trustee	129	250	15 00
" " "	322	250	15 00
" " "	429	1,040	62 40
Shaukland, Rolt	144	600	36 00
" "	173	400	24 00
Taylor, J. N	102	1,000	60 00
" "	330	40	2 40
Waller, L. P. F., Trustee	358	100	6 00
" " "	367	3,000	180 00
" " "	458	100	6 00
" " "	459	100	6 00
" " "	460	100	6 00
Winn, A. H., Trustee	466	1,000	60 00
Wetzel, Theo., Trustee	337	40	2 40
" " "	360	1,000	60 00

And in accordance with law, and an order of the Board of Directors, made on the 16th day of October, 1889, so many shares of each parcel of such Stock as may be necessary, will be sold at public Auction, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California, on TUESDAY, THE TENTH (10th) DAY OF DECEMBER, 1889, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

J. M. BUFFINGTON, Secretary.

Office, Room 11, No. 303 California St., San Francisco, California.

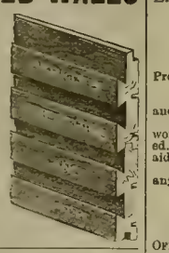
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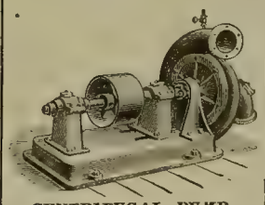
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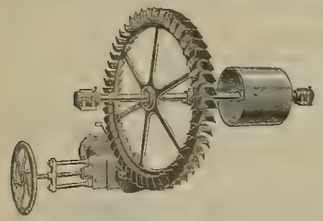
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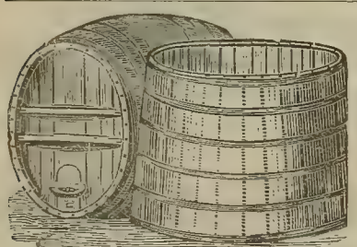


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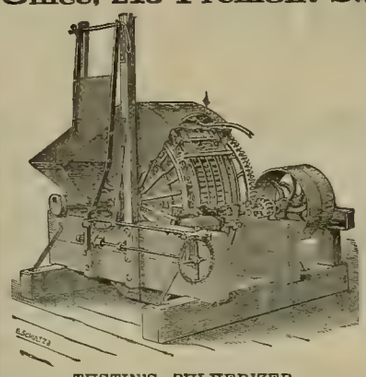
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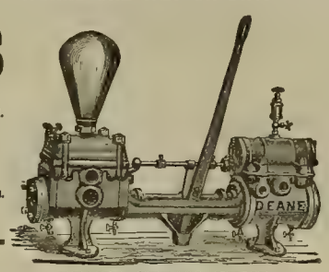
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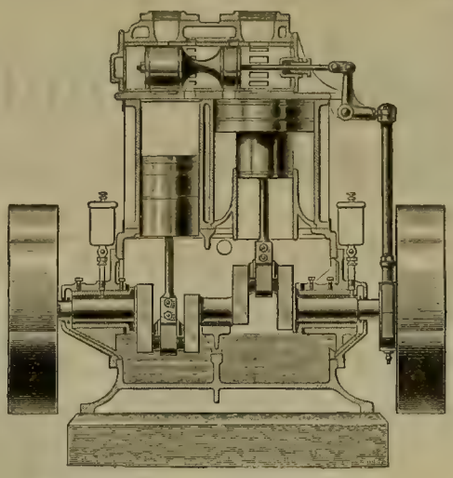
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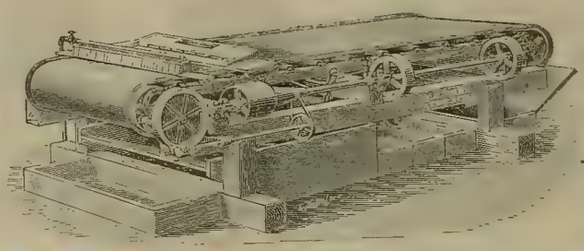
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There are Over 2200 Plain Belt Machines now in Use.

THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

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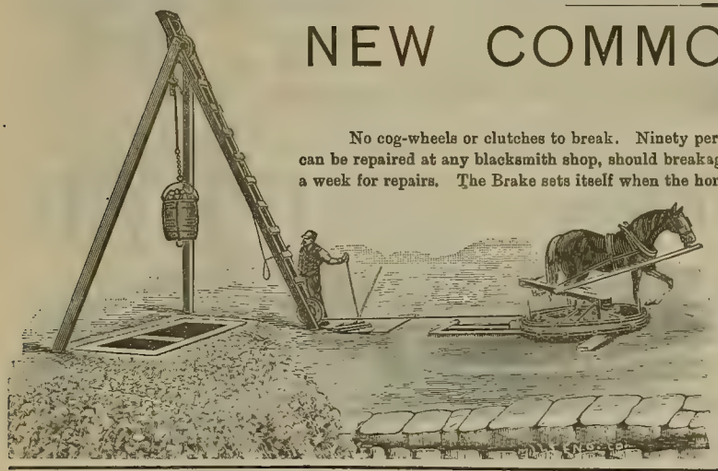
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It can be packed anywhere a jack can go, the heaviest piece weighing but 100 pounds; total weight, 650 pounds. The sweep can be thrown out or in gear at any time, and the bucket hoisted, dumped or lowered while the horse is in motion. It is just as safe and reliable as an engine, and can be handled as readily, and is just the thing to open up a mine and make it pay. Spending thousands of dollars in fine machinery and shaft houses has "busted" many a company. Buy a COMMON SENSE WHIM, and when you have got more ore than our Whim will hoist, then it is time to buy an engine, not before. It will save you thousands of dollars if your mine should not pay. Being all iron except the sweep, it will not rot, warp, twist, or get out of true. Being wrought iron, it will not break in transportation. We also make TWO, FOUR and EIGHT Horse Power Whims, Derrick Whims, and Building Hoists, Ore Buckets, and everything pertaining to Horse Power Hoisting. State for what purpose, and at what place you want to use it.

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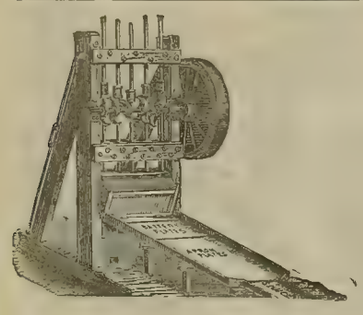
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VOL. LIX -Number 22.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, NOVEMBER 30, 1889.

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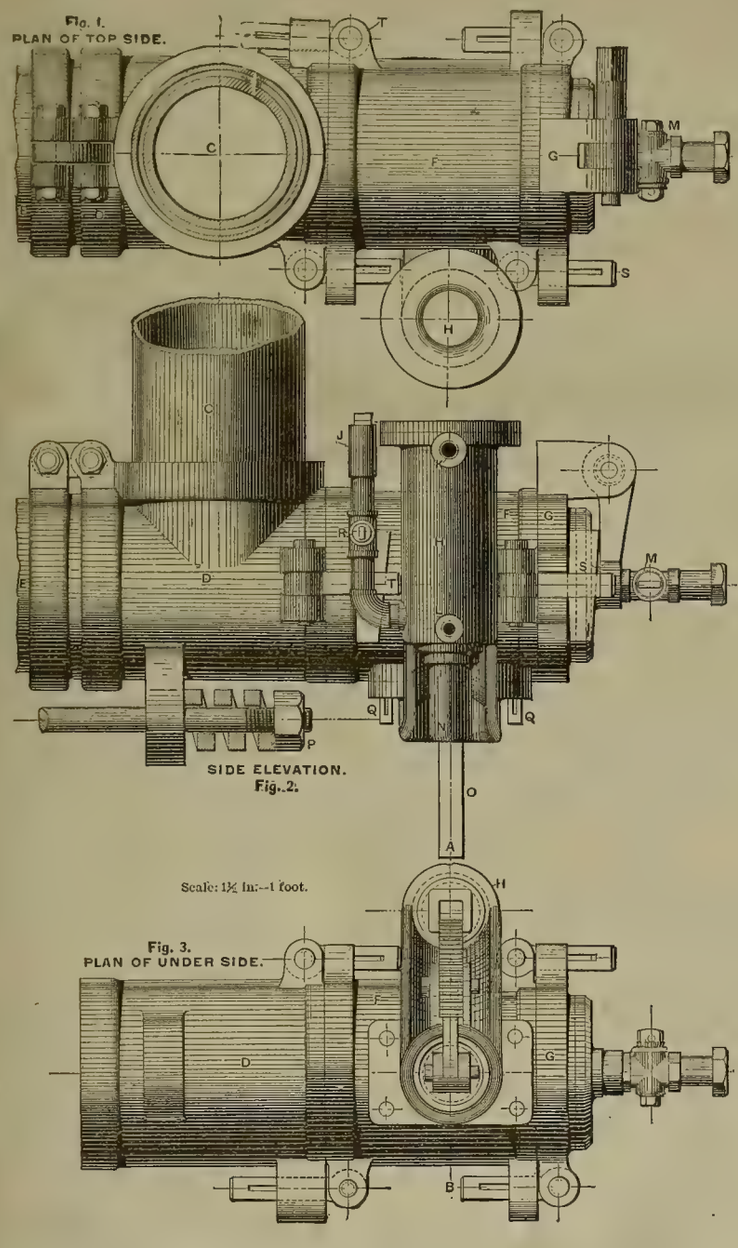
A Cheap Radial Drill Press.

The Keystone radial drill press, herewith illustrated, is intended for a large range of work.

It takes in a pulley up to four feet in diameter, and may be used for boring small cylinders and similar work.

The feed-screw will feed 14 inches, and has adjustable automatic feed. The back gearing is all inclosed. The circular table is 24 inches in diameter, and is bored to receive bushes for boring bars. The table can be raised or lowered without being turned around. The square tilting table is an extra table, slips in the slotted side of the bed, and can be quickly removed. It is convenient for drilling work at any desired angle. It can also be used as a straight table.

The drill has a radius of 60 inches, giving a distance between column and spindle of 34 inches. The column is 12 inches in diameter and 6 feet high. The entire hight from floor to top of feed-screw is 8 feet 10 inches; weight, 2800 pounds. The drill has strong gearing and the boxes are easily renewed. The lower spindle-box is brass, and is so constructed that in time of wearing lost motion can be taken up by a simple turn of a nut. The Parke & Lacy Co. are agents for this tool on this coast.



A TUYERE SLAGGING-VALVE FOR FURNACES.

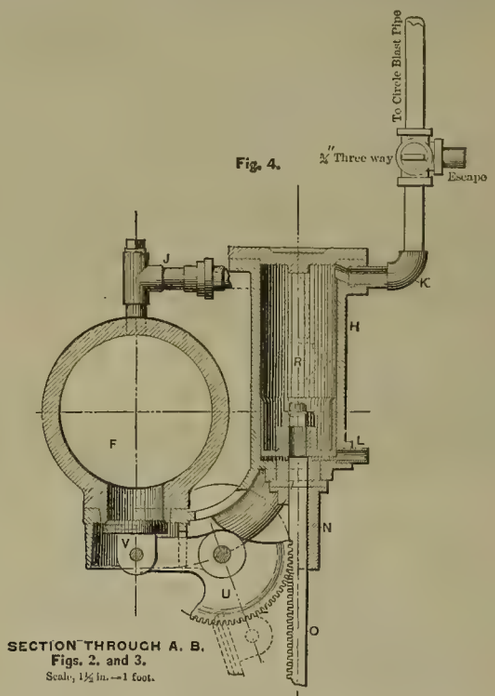
THE five-stamp mill being erected near Silver City, Nev., by J. B. Dazet to crush ore from the Lacruits mine in that district, will be completed early in January.

THE "Lead trust" appears to be in a bad way just now, a number of prominent men having sold their holdings of trust certificates.

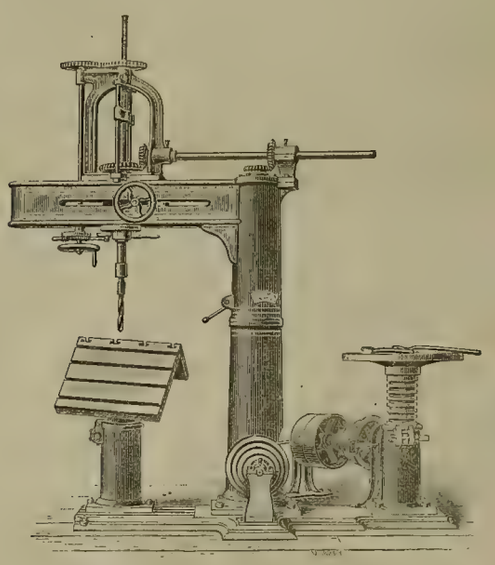
A Tuyere Slagging-Valve.

Mr. Edgar S. Cook of Pottstown, Pa., has long been desirous of providing a safe and easy method of relieving the tuyeres of slag when the cinder and iron notches are chilling through loss of heat in the crucible, or when, from dropping or jumping of stock, the molten slag is forcibly driven into the belly and leg pipes. The importance of a practicable tuyere slagging-valve impressed him very forcibly in his furnace work, and experience brought into ex-

(*Continued on page 416*)



TUYERE SLIDING VALVE.



THE KEYSTONE RADIAL DRILL PRESS.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Water-Engines and Mines.

EDITORS PRESS:—On a recent visit to Sierra City and vicinity, I was quite interested in some new machinery in the Marguerite mine, concerning which, the superintendent being absent, the clerk, H. P. Parker, kindly gave me the following information:

The engine is a *water* engine. The power is supplied by a ditch five miles long, with a pressure of 360 feet. The engine and pump were made by Knight & Co. of Sutter Creek, Amador county, and are pumping at present at the rate of four strokes per minute, and raising 30 miner's inches of water. The capacity of the engine is 12 strokes per minute, and guaranteed to raise 50 miner's inches of water 1000 feet. The mills and hoist, both operated by Knight wheels, run by the same water-power, and each independent of the other. The engine and pump were put in place and are for 60 days under the control of Mr. E. Post, engineer for Knight & Co.

I am sorry that I cannot explain the working of this powerful engine, the importance of which, in the mere matter of saving wood alone, is very great, as, if I am not mistaken, Mr. Parker told me that the cost of cutting and hauling the wood to run a steam engine formerly used by this company was $100 per month. Mr. Post informs me that there are but four of these engines in use—two at the Plumas Eureka mine, one in Amador county, and this one.

This mine is owned by a Boston company, and under the able management of Mr. Fred Morris, who has had a great many obstacles to overcome, but who bids fair to surmount them all, as there is only about 30 feet to sink to make connection with upraise from drift in fourth level.

This is a 20 stamp mill. The Marguerite mine is about 2½ miles below Sierra City.

Sierra City, in Sierra county, has been one of the best mining sections in the State. It is to be hoped that the present depression is of a temporary character, as owing to some of the mines going into the hands of foreign capitalists, it is probable that more economy will be exercised in working them than has heretofore been the case.

To one deeply interested in the welfare of his country, the great mineral wealth of our State is a subject of deep interest. To the miners of "forty-nine" and the early fifties, who, with the insufficient tools of the times, were seeking to penetrate the heart of the mountains, the extensive mining operations of to-day are stupendous in their magnitude. WILLIAM ARMS.

Beckworth, Plumas Co., Cal.

Hayden Hill, Lassen County.

EDITORS PRESS:—Times are rather dull at Hayden Hill at present, though a few of the mines are looking well. The old Juniper mine is now being worked by Messrs. McLane and Owens, who have a lease of it and have started a new shaft to get down into the old works. The mine has been lying idle for some time, but there is now a small dump of pay ore from the new shaft.

On the southeast side of the hill is the Eclipse mine which was located Jan. 1st of this year (the day of the total solar eclipse) by Messrs. Auble and Dunbar. It was a relocation, the claim having previously been worked by other parties. They are getting a good prospect. Mr. Auble brought up from the mine a horn of decomposed quartz which he crushed in my presence and got a good $80-prospect. He then horned out ore from different parts of the dump and got nearly as good a prospect. He thinks the ore he is taking out will go from $30 to $80 per ton.

The old shaft is 80 feet deep. They are working on the 40-foot level and have drifted 58 feet in a N. W. direction, all the way in good ore. They have also drifted 71 feet in a S. E. direction in the same kind of ore. They will make a run at the mill within the next 30 days; then they can tell better what the mine will pay.

I called at the Evening Star mine, worked by Preston & Howard. The men at the whim told me they were working on pay ore. On the 80-foot level the vein is of decomposed quartz paying from $10 to $20 a ton.

Mr. Norton is working his claim all alone. His tunnel is on the S. E. side of the hill, and running north toward the Brush Hill mine. If he strikes that vein he will have a great advantage over those who are hoisting by hand.

H. K.

The "Silver Articles" in the Press.

EDITORS PRESS:—Copies of your valuable papers containing silver articles have been received and are greatly valued. I find in the issue of July 27th some figures on the relation between the price of wheat and silver. At our recent silver convention I had the honor of being placed upon the Committee on Resolutions and desired to have this feature of the subject touched up in the work of the Committee. Mr. Buchanan, Chairman of the Committee, insisted that my position was wrong; and, strange to say, I could not get my hand on the figures required to prove my position. This will show you how much these copies of your paper are appreciated.

WM. BALDERSTON,
Aspen, Colorado. Associate Editor *Times.*

Re-working Old Dumps.

Working over the old dumps at the mines about Butte will prove to be a profitable business in a short time. In fact, a few of the larger mines are now using to advantage that which they at one time thought they would have no use for. Said a prominent mining-man to a *Miner* reporter yesterday: "When the mines of this camp first commenced to develop, a great deal of good ore, both silver and copper, was thrown over the dumps because the two metals were selling at a higher figure than they are at present. In those days it didn't cost much to operate a mine, because the work was done near the surface. The men who worked mines at that time did not know exactly what they had. They shipped away for reduction a great deal of ore, and, of course, nothing but the very best went, as the crude way of transporting it made the freight charges high. All of the second and third class lots were thrown over the dumps. Now that facilities are handy for working these dumps, it will be only a question of a short time until they will be made to yield up many dollars in silver and copper. You see, the essence of the business is just this: When these mines were first worked, the ore was very rich and easy to get at, but now the shafts are getting deep; and while I am not exactly prepared to speak of the quality of the ore at the lower workings, I will say that the veins are no larger than they were above, nor is the expense of extracting it any less. Where the vein is narrow and the granite hard, as is the case in the deeper workings of some of Butte's mines, it costs considerable money to carry on operations, and the dumps will come in play when this state of affairs is reached, if it has not already been arrived at. There is about as much money in working over some of those dumps as there is in working the rock hoisted from the 1200 and 1300 foot levels, and I believe that in the near future all of the old dumps will be hauled to reduction works and the bullion extracted from them."—*Butte Miner.*

No Right to Use the Timber.

The suit brought by the Government against John R. Hite and John W Snyder, which has been on trial before Judge Sawyer and a jury in the United States Circuit Court, has come to a conclusion. The defendants, who are wealthy residents of Mariposa county, had, it was claimed, been engaged in unlawfully cutting timber on Government land during the greater part of ten years, from 1877 to 1887. The land is located in sections 15, 22 and 25, township 4 south, range 19 east, in Mariposa county, and was up to 1885 unsurveyed. The amount of damages claimed by the federal officials was $91,020, and there was what they deemed positive proof adduced in the trial that from $65,000 to $70,000 worth of timber had been cut and appropriated by the defendants during the ten years. Most of the timber was sawed by a mill owned by Hite, situated near by and about 15 miles from Mariposa.

The defendant Hite claimed that the timber had been used by him chiefly in a mine, and that under the mining laws he had a right to appropriate the trees for that purpose. This point was not, however, favorably received by the court.

The jury, after deliberating for five hours, returned a verdict in favor of the Government, fixing the damages at $5000.

Amador Gold.

On August 31 last we had an article on mining operations in Amador county. The Amador gold mine (limited) came in for an extended notice on account of the magnitude of the work in progress. Much interest has been evinced in the county and also in mining circles generally as to the outcome of the large investment in this property in mine and mill. We see by the *Amador Ledger* of recent date that the ledge, about 30 feet wide, which was cut two or three weeks ago on the 550-foot level, is apparently the same as that on the 250 foot level, but prospecting rather better in gold at the deeper point. The 60 stamp mill, it is said, will be started by the first week in January next, by which time every appliance, including the water supply, will be in order for continuous work.

MINING TIMBERS.—Some idea of the enormous quantities of timber used yearly in the mining industry may be formed when it is known that in the Anaconda mine alone, near Butte City, Mont., 80,000 feet of timber are put under the ground daily, or at the rate of 30,000,000 feet a year. At the smelting works at Anaconda, belonging to the same company, there are 180 cords of wood used daily, or 65,700 cords a year. Nearly 1,000,000 cords of wood are kept on hand. All the timber used for mining purposes can be legally cut from government land.

CANNING FACTORIES.—This country has 1000 canning factories, and leads the world.

Cotton in California.

Experts acquainted with cotton production in other parts of the world and the conditions which favor excellence in the staple have often assured us that many parts of California are well adapted to the growth of the staple. Prof. E. W. Hilgard of the State University, who was selected by the Government as best fitted to expound the cotton industry of the United States in the work of the Tenth Census, made a very careful and comprehensive examination of California soil and climate and a study also of samples of cotton grown here, and shows conclusively that not only is it practicable to grow cotton but that the quality is of peculiar excellence. This fact is also established by the many little experimental patches which have been grown by interested people from the Mexican boundary to Shasta county, and by the production on a commercial scale at several points in the San Joaquin valley. Although there has been in former years some uncertainty about a local market for cotton and there has been difficulty about gathering the crop, there has never been anything to reflect upon the natural adaptation of our soil and climate for the successful production of a most praiseworthy staple in the highest degree acceptable to the manufacturers.

The California Cotton Mills Co. at East Oakland, Alameda county, has been in operation about five years. The incorporation has an authorized capital of $600,000, and a paid-up capital of $330,000. The following constitute the Board of Directors: G. W. Beaver, President; V. D. Moody, Vice President; Wm. Rutherford, Manager; J. C. Ainsworth, John Center, E. W. Newhall, —Crist, M. Leaventreth, E. C. Sessions. The mill is eligibly located adjacent to railroads and navigable water. The buildings are new and substantially constructed of brick and iron. The machinery is of the latest improved styles, and the establishment has a capacity for working up 1,500,000 pounds of cotton and 1,000,000 pounds of jute per year. There are now employed 200 hands; 160 women and 40 men and boys. The establishment is well equipped throughout, and being under the personal direction of Wm. Rutherford, the manager, who is an acknowledged expert in his line, is conducted in the most approved manner.

The Cotton Mills Co. have just issued two interesting pamphlets which should be sent for by all who contemplate trying cotton as a crop. One discusses "Cotton vs. Wheat" and shows the advantage to the individual and to the State which would accrue from the production of cotton. The other treats of "Cotton Culture in California" and gives explicit directions by aid of which any one can begin the growth of the plant in this State. These publications and any other specific information which may be desired can be had by addressing the California Cotton Mills Co., East Oakland, Cal.

There are vasts tracts of land in California, much of it almost unoccupied, capable of producing cotton equal to anything grown in Texas.

STAMP-MILL POWER. — A well-informed stamp-mill employe is authority for the statement that a carefully prepared estimate shows that the Carson-river mills, operated by water-power, handle ore for $1.60 less per ton than the California mill, which latter is operated by steam. Deducting $1.25 per ton, the cost of transporting ore over the Virginia & Truckee Railroad, the difference in favor of the river stamp-mills will be 30 cents per ton. The *Chronicle's* informant says this difference can be reduced to a mere fraction by the exercise of rigid economy in operating mills by steam. If his statement is correct, there will be no need hereafter of suspending the crushing of Comstock ore from four to five months in each year on account of a lack of water-power to operate Carson-river mills, as shareholders in bullion-producing mines will no doubt cheerfully consent to pay an assessment for the erection of steam stamp-mills contiguous to their property where they can be operated at their full capacity as long as the ore resources hold out. The California mill, through the "Boss" process of amalgamating ore pulp, saves 92 per cent of the assay value, whereas 85 per cent is the average of the assay value of pulp saved from ore crushed in Carson-river mills.—*Virginia Chronicle.*

A LADY'S NOSE AS A WORK OF ART.—Mrs. Hoffman, of Brooklyn, has recently had a new nose made for her at the Long Island College Hospital. The bridge of her nose had been destroyed by disease. The surgeon raised the skin that formerly covered the nose, divided it lengthwise, and then inserted a breastbone just removed from a live chicken, with the cartilaginous filament and periosteum adhering to it. The skin was then drawn over the bone and sewed, and the doctor thinks that in a short time Mrs. Hoffman's nose will be as good as anybody's.

AN IMPROVED TRUMPET.—A trumpet producing its musical note by the vibration of a circular steel membrane by means of electricity has been invented by Captain Zinang of the Thirteenth Infantry, in garrison at Domfront, Orne, France.

THE loss to Con. California and Virginia shareholders through the discount on silver since the ore discovery in that mine in 1886, aggregates nearly $2,000,000.

Astronomical Photography.

Its Uses in Observatory Work.

[A lecture delivered Sept. 9, 1889, before the Cosmos Club of San Jose by CHAS. B. HILL of the Lick Observatory.]

Perhaps it is safe to say that fully half of the routine work of the great observatories in future years will depend upon photographic methods. For a great number of years the continuous record of the ordinary physical phenomena, such as the rise and fall of the barometer, the daily curves of temperature changes, the oscillations of the magnetic needle and the variations of the magnetic intensity at any given point on the globe—the systematic observation of which in the usual way would demand the utmost attention and the most trying labor—such record has been tirelessly, faithfully kept by the action of light on sensitive sheets. The observer once a day, or once a week, winds up the clockwork which is to keep a strip of the prepared paper continuously exposed, for example, to a beam of light reflected from a tiny mirror fastened to the extremity of a magnetic needle and properly adjusts the position of the scale; and for the remainder of the 24 hours, or of the seven days, as the case may be, every minute vibration of the magnet is automatically recorded, and for any given time its exact relation may be found. There are many mechanical devices for securing a continuous record from *meteorological* instruments, several of which are now in use at the Lick Observatory, but the photographic method is, I believe, the one invariably employed in the self-registering magnetic apparatus. At Kew, in England, such instruments have been employed for years; since 1883 a magnetic observatory for continuous photographic records has been conducted at Los Angeles, in California, by the U. S. Coast and Geodetic Survey. Many important discoveries owe their confirmation to the existence of such records; the connection—long suspected—between the eruption of spots on the sun and magnetic storms on the earth, was conclusively proved by the sheets from the magnetic instruments. The intimate relation between the *aurora* and magnetic disturbances has been definitely settled by a comparison of auroral observations with the magnetic records—in many instances it has been found that for every outburst of the northern light (even of one observed in this country) there could be detected, at the same instant of absolute time, a vibration of the magnetic needle faithfully registered on the automatic record at the Kew Observatory.

In this, as in many other ways, the photographic art has been utilized as "the *servant* of astronomy." It now seems time, as I will attempt to show you, to accord her at least an equal rank with the sciences of optics and mathematics, in the prosecution of the grand studies of astronomy. Much has been written within the past few years to show the wonderful opportunities for extending the knowledge, not only of "sidereal astronomy" but of astronomical physics which photography offers the student.

Some of the Results

In this new investigation have been really revelations. Without going into special details for the present, but merely as an illustration, it may be instanced that a plate properly exposed in the focus of a photographic telescope, will not only show every star which might be seen by the observer with an equally large object glass and a field of view of the same extent—and show them, too, with a distinctness and accuracy which will admit of the most precise micrometrical measurement—but, what is most remarkable, such a negative will reveal thousands of fainter stars and faint nebulous patches which could not be glimpsed through the telescope by the sharpest eye and with the most persistent efforts!

That advances in this art have been marvelously rapid within the past few years, may be inferred from the following fact: In October, 1886, A. A. Common, Esq., of the Royal Astronomical Society, delivered a lecture before the Royal Institution of London on "Photography as an Aid to Astronomy."

Less than one year later Prof. David Gill, Her Majesty's Astronomer at the Cape, in prefacing his lecture on "The Applications of Photography in Astronomy," delivered June 3, 1887, before the same body, said, after speaking of Mr. Common's lecture, "Given by one who is a consummate master of the art of celestial photography, that lecture (complete as to history, and full of suggestion as it was) would, under ordinary circumstances, have precluded further reference to the subject in these Friday evening lectures for some years to come. But the past year has witnessed such

Developments of the Subject,

And the importance of photography in astronomy has been so much advanced by the conclusions of the recent 'Astro-Photographic Congress,' as to afford a reasonable apology for the present lecture," etc.

The Conference, to which Dr. Gill had reference, was held in Paris, in 1887, principally with the view of enlisting a number of observatories in all parts of the world in the execution of a piece of work which recent experiment had shown to be practicable; namely, that of "making a photographic chart of the sky for the present epoch," etc.

The different resolutions of the Conference, embodying the work proposed to be done, will

be referred to at greater length in due time. The undertaking is worthy of the labors of an International Conference of scientific men; it is proposed among many other things to obtain a series of plates each about 4 square, to cover the whole sky from the north to the south poles, and showing every star, nebula and cluster in the heavens within reach of the ordinary working telescope, and down to the 14th order of star magnitude. In other words, over 10,000 plates; and over 20,000,000 objects!

Here we have a wholly new scheme of work for the employment of our active observatories, in addition to the routine at present carried on; one entirely new in design and even the conception of which has been the outcome of very recent years.

It would be a curious and interesting study to take the files of the astronomical journals for the past 10 or 12 years—which we have in the library of the observatory—and to follow out the history of the successive experimental steps which have gradually led to the present conditions. In fact this has been to a great extent already done by a number of astronomers who have specially interested themselves in the work. I have availed myself of some of these papers, and will invite your attention to a brief resume of what photography has accomplished in this line from the very first picture to the present day, exactly half a century. For the sake of convenience and brevity, I will make an arbitrary division of the history into two periods—limiting the account of the first 35 or 40 years' work to the results obtained in lunar and solar photography; and dealing in the recital of what has been accomplished in recent years, almost entirely with "stellar" photography.

Part I: Lunar and Solar Photography.

The third decade of the present century had nearly run its course before Daguerre's discovery of the chemical action of light and the invention of his "Daguerreotypes" were announced to the world. The story of this remarkable discovery, and of the evolution of the grand art springing from it, belongs properly to a history of photography; nevertheless, each step in that development had an important effect upon its application to the uses of astronomy.

The new study was acknowledged to be of the greatest scientific importance from the very first, and almost with Daguerre's first plates were attempts made to photograph the moon and sun, and to thus apply this unbiased and automatic method of *light-painting* to the delineation and illustration of the "exact science." But the daguerreotype was not sufficiently sensitive to acknowledge any impression whatever of the moon's light when the inventor himself first made the attempt; and Prof. Draper, of New York, in his first trials (as early as 1840), succeeded but little better, and only obtained a few prints, "not altogether characterless of the lunar surface." The sun, as you may readily surmise, was more effective in its action. The first work in solar photography is said to have been done in Paris, April, 1845. All these early attempts were unsuccessful on the whole, and gave not the least promise of the modern achievements.

Ten years and more had elapsed from the inception of the art, when the collodion process was introduced by Archer. The new plates were vastly more "sensitive," and a decided improvement in lunar and stellar photography at once resulted. The pictures obtained from the introduction of this process to the time of the modern gelatine "dry-plate" (Maddox, 1871), while a great advance on all previous work, nevertheless demanded a *long exposure*, and from an astronomical standpoint this is a great difficulty, and when exposures of three or four hours are imperative, it becomes a fatal defect, for the image of the object to be photographed will not remain passively upon the plate as that of a landscape or building, but will move out of range rapidly, as a star out of the field of view of the telescope, on account of the apparent rotation of the heavens caused by the earth carrying the camera or telescope past the object. When the object is a star or cluster of stars, this difficulty is effectually remedied. The clockwork movements of our modern "equatorial telescopes" are able to keep the telescope so accurately pointed on a star, that even with the highest power eye-piece, the star will not appear to change its position in the field.

The Equatorially Mounted Telescope,

As is well known, is able to follow a star in its diurnal revolution by means of a *single movement* of the telescope; for the simple reason that all the stars in the heavens appear to revolve around an axis corresponding to the polar axis of the earth, and the main axis of this special form of telescope is set *parallel* to that. But when we are trying to photograph a planet, a comet, or the moon, etc., the movement of the object becomes very complicated. In this case, in addition to the earth's rotation, we have the actual proper motion of the object itself (not limited to a parallel of declination, either). With the moon this proper motion reaches a maximum, for the moon moves its own diameter among the stars in about an hour; and the brighter planets, while moving at the most less than one-tenth of that amount, would still change their position sufficiently to blur the photographic image after an exposure of more than a very few minutes.

To photograph even the moon it was formerly necessary to make an "exposure" of say half an hour. The modern dry plate is so much more sensitive that better and sharper pictures are now made in 1-50th of a second. Up to very recent times, or about 1882, the difficulty of *movement* was of far less moment than that arising from lack of sensitiveness of the plates. It was a comparatively easy matter for the astronomical photographer to carefully watch the object through the "finder" of his telescope, and, by means of the slow-motion screws, thereby keep the apparatus properly pointed.

But the "wet-collodion" process was open to other objections; the plate had to be prepared immediately before the exposure and developed immediately afterward, and moreover, it had to be used while wet, and that necessarily limited the time of exposure. To sum up the conditions which obtained prior to the "bromo-gelatine" dry-plate epoch, the sun and moon were easy objects; the extraordinary brilliancy of the former permitted a very brief time of exposure; and for the latter the image could be easily kept in position on the plate by an auxiliary telescope; the time required was not too great to utilize the full power of the wet plate, and if there were any trifling irregularities in the motion of the clockwork the plate was not sufficiently sensitive to record them.

First-class photographs of the sun and the moon were made many years ago by Warren De la Rue in England, and by L. M. Rutherfurd and Dr. Henry Draper in New York. About 1852, De la Rue constructed a reflecting telescope of 13 inches aperture especially for photography; the image of the moon on his negatives was about one inch in diameter, and would stand enlargement about eight times. [The corresponding image formed by the Mt. Hamilton lens is 6-inch diameter, and it may be enlarged over 12 times.]

Reflectors and Refractors.

It is the universally accepted theory that light is propagated by waves, not entirely similar to the sound-waves, or air-vibrations, by means of which we hear, but by undulations of a mysterious and all-pervading elastic medium, which is called the ether. By means of the object-glass of a telescope, the rays of light falling on all parts of its surface are brought to a focus at the eye end. The object-glass is given a certain definite curvature so as to achieve this result, and upon the accuracy of this figure of curvature depends the excellence of the glass.

For perfect definition of the image, it is necessary that *all* the different rays from a distant *point* falling upon the object-glass, no matter how large this may be, shall be brought so closely to a focus as to all pass through the smallest hole we could make with a fine cambric needle in a piece of tissue paper. But it is found that rays of a certain "wave-length" have the greatest *visual intensity*, and enable the eye to perceive the object disseminating the light; but those rays which are principally effective in acting on the photographic plate (or the rays of *chemical intensity*) have an essentially different wave-length and do not come to a sharp focus in the "visual" telescope, and this necessitates a different figure in the object-glass. In the case of a reflecting telescope, waves of light of these different wave-lengths (embracing both the *visual* and the *chemical* rays) are all brought to a common focus; hence photographs taken with a reflector are of greater excellence than those taken with an ordinary refractor, or "achromatic" object-glass. But the finest results are obtained by the use of a telescope of the latter construction, the objective of which has been especially corrected for the photographic rays.

Such an object-glass Dr. Rutherfurd constructed in 1864; in other words, "he set the example of deliberately constructing a telescope totally unserviceable to the naked eye." The resulting pictures were highly successful; Rutherfurd's series of lunar photographs taken 25 years ago are probably to-day only excelled by those taken under the great advantages of extra sensitive plates and the "giant telescopes of the world."

But it is not absolutely necessary to destroy the figure of an object-glass in order to adapt it to the wants of photography. The same result may be achieved by the addition of an extra lens placed in front of the crown and flint-glass combination of the refracting telescope, to bring the photographic rays to a focus. The only drawback to this method of correction is found in the loss of light experienced in passing through the additional amount of glass; but with our Lick telescope, this is actually of little consequence, the amount gathered in by this huge light-collector is so considerable.

Photographs not only give most beautiful pictures of the moon—they have greatly increased our knowledge of the sun.

Photographs of the Sun.

Many years have passed since it was first pointed out, as a result of the laborious and long-continued scrutiny of the solar surface by Schwabe, Wolf and others, that the spots which so frequently relieve the white monotony of the sun's surface appeared in regular periods of about 11 years, or rather that a cycle of maxima and minima in the appearance of these spots, possessed such a period. Up to the year 1857 the only data upon which to found these conclusions were obtained from the very irregular and imperfect notes made by a few astronomers who had the necessary leisure to carefully scrutinize the surface for spots, and the method to properly record their observations.

But in the year mentioned, Mr. De La Rue constructed what was called the "photo-heliograph," for the Royal Observatory at Kew, England; others are now in use at many observatories situated in widely different localities of the earth, and at the present time it is likely that not a day passes without at least one perfect photograph of the sun's surface being taken, carefully examined, and filed away for reference. These photographs have been brought to such a state of excellence that not a spot which might be seen by the observer with the telescope, can possibly escape a permanent record on the plate. And they have shown beyond doubt that the suspected 11-year period really exists.

By far the best work in solar photography has been done by M. Jannsen of Meudon, near Paris. His negatives show all the detail of "rice-grain" structure of the surface, and the curious mottled appearances which have been observed in the field of the telescope. In some of Jannsen's photographs the developer found certain large blurred or hazy patches, which were naturally ascribed to defects in our atmosphere. But when these "blurs" were found recorded on several successive plates taken at short intervals, and were seen to be identical in situation and appearance, it was suggested that the camera had thus divulged the existence, previously unsuspected, of *clouds in the sun's atmosphere!* The records of the United States

Transit of Venus Parties

In 1874 and 1882 depend very largely upon negatives taken with the photo-heliograph while the transit was in progress. In the first transit, photography was included in the plans of work of all the various Government expeditions. The results by all the foreign parties were pronounced unsuccessful. The American Commission did not, however, reject photography in the preparations for the transit of 1882, but provided each one of the American parties with a photo-heliograph and a supply of the latest improved plates, and the results far exceeded their expectations. The images are nearly all sharp and good, and admit of very precise measurement; and the position of the planet on the sun's surface can be deduced with the utmost nicety for the epoch of each plate taken. It is said that if no other work of observing had been done by the different parties, the photographs alone would afford the most valuable data for the reduction of the parallax. The advantages of the photographic method in this case are manifest; clouds might be passing at the critical times of contact, which lost, the observations would be valueless, were the sky never so clear during the remainder of the phenomenon. The best of experienced observers are prone to get nervous and excited during the few precious instants at the ingress and egress of the planet. The camera does its work faithfully, methodically, and is not subject to nervous attacks. Its record is unbiased, and can be verified at any time—as some one (the amateur photographer) says in the "Octoroon," "the apparatus can't lie!" The value of the photographic work done by the different U. S. Government parties in 1882 was largely supplemented by a series of photographs taken with similar instruments at the Lick Observatory.

A Total Solar Eclipse.

I will show you on the screen to-night a positive from one of the wonderful photographs taken by Mr. Barnard at Bartlett Springs during the total eclipse of the sun on the first day of January. From what has preceded, you will readily see that a total solar eclipse affords a splendid example of the advantages of photography. The moments of totality are so brief, and the phenomenon itself so rare in its occurrence, that much remains to be done, or that might have been done, or that the careful and hard-working observers wish they could have had the chance to do, when the long-expected event is finally over, and when the blinding light of the sun is no longer screened so completely by our distant satellite. The different things to be done are numerous in the extreme. There are the corona to sketch; the flames to locate; unknown planets to be searched for; all the old-time observations to be verified, and the still more valuable and more recent investigations with the spectroscope and kindred appliances, to be carried out, if we hope to add to our knowledge of the solar surroundings and constitution.

Photography here plays a very important part. Formerly it used to be an invariable result of a total eclipse to have one observer announce the discovery of a new intra-Mercurial planet, and for some one else to as flatly contradict him, and state that the "planet" was really a well-known star. The photographic plate will show a planet that might readily be overlooked in the hasty "sweeps" of the observer, and moreover, this plate may be easily compared with the sky itself when the sun has so changed its position in the heavens as to make such a comparison possible.

Negatives taken by De La Rue in the eclipse of 1860 established the true nature of the "solar protuberances" which had so long puzzled the astronomers; and first proved that they must belong to the sun and not to the moon, for the image of the latter was shown to advance over them in successive photographs.

Photographs of the "Corona"

Are much more complete and reliable than naked-eye sketches. The spectrum of the corona, and of the sunlight at the moon's edge, may be photographed to study the actual nature of the former; and to exhibit how the latter either may or may not be an effect of diffraction, or possibly influenced by passing through what some believe to be an extremely attenuated atmosphere possessed by our moon. And so on, *ad infinitum*. Then we have the interesting episode of the Total Eclipse of 1882, in Egypt, when the British party found on their photographs taken during totality, a comet close to the sun, which had approached that luminary in a line directly toward the earth, so to speak, and which was at no other time beheld by man. You will appreciate the estimation in which the photographic method of eclipse observation is held by astronomers, when I add that the expedition gotten up by the liberality of Hon. Chas. F. Crooker, Regent of the University of California, will take the two senior astronomers of the Lick Observatory, with over a ton of scientific baggage, thousands of miles by sea and land to Cayenne, in French Guiana, solely in order to secure photographs of the total eclipse which will be visible there next December.

(To be Continued.)

CARPET MANUFACTURING IN PHILADELPHIA. Philadelphia is said to be the largest carpet manufacturing center in the world. The *Price Current* of that city says: When we are told that the carpet manufacture of Philadelphia was begun in 1857 by John Bromley with two small looms, and now employs 7350 power looms with a product of 72,500,000 yards, worth $45,000,000, every year, we have cause for proud surprise. The industry of carpet-making in this city is the signal one in the world, for there are here 172 mills employing nearly 18,000 workmen. The Bromley enterprise has branched out into three firms, with 1100 looms and 2800 hands, and the mills of the Dobsons, started in 1872, give employment to 4000 persons. At first only plain carpets were made, but of late years fine goods have been turned out, of such beauty, durability, fine texture and dye that the importation of brussels, tapestry and wilton carpets has been virtually broken up, our manufacturers turning out choice goods of all kinds.

DECIDED TO BE AGRICULTURAL.—The Federal Land Office at Sacramento has received from the Interior Department a decision in the case of F. Wagner. Wagner had pre-empted certain lands in the upper foothills of El Dorado county, which, by reason of their altitude, are covered with snow during the winter months, and at such times are not habitable. In the case of Morrow vs. Clough, decided in 1885, it was held by Commissioner Sparks that such lands were not subject to entry under the agricultural laws, although the decision was reversed by Secretary Lamar. In the Wagner case, the Sacramento Land Office and the Commissioner rejected Wagner's final proofs on the grounds stated in Commissioner Sparks' decision in the Morrow-Clough case, but Secretary Noble has reversed the decisions and has ordered that a final receipt be issued to the claimant. This virtually decides that agricultural claimants have a right to pre-empt such lands.

MINERAL OIL FOR WOOL.—It is claimed by many that aside from any difference in the cost, mineral oils have certain decided advantages over animal and vegetable oils, as lubricants for wool. The principal objection is that they are lacking in "body;" yet the fact is very generally conceded that the finest cylinder and valve oil, the finest machinery, even for hot neck and crank pin oils and for the sides of ferry slips, is now made from the product of oil wells. For wools the superiority of such oils consists largely in its superior penetrative quality and the extraordinary facility with which it is saponified, and the further fact that it holds its saponification for years quite unimpaired.

DIVIDENDS.—For the ten months ended October 31, 1889, the mining companies of the United States whose shares are listed upon the stock exchanges of the country paid a total of $9,119,868 in dividends. The largest amount, $2,000,000, was paid by the Granite Mountain mine of Montana. Next was the Calumet and Hecla of Michigan, with $1,000,000, and next in order were the Con. California and Virginia of Nevada with $756,000, Ontario of Utah with $750,000, Tamarack of Michigan with $640,000, Boston and Montana of Montana with $400,000, the others paying out all the way from $1000 to $375,000.

THE Nevada *Journal* says that since the abandonment of the 1200 level of the Bodie mines, nothing of interest has transpired and the outlook for that district was never so gloomy as at present. Unless an ore development is speedily made it is probable that all the mines there except the Standard Con. will suspend operations.

REMARKABLE STEEL PROJECTILES.—At the Paris Exposition the firm of Holtzer show a shell which pierced a steel plate ten inches thick and landed entire without a flaw 800 yards, or nearly half a mile, distant from the target. Only the point of the shell was slightly distorted.

CREMATION is coming more and more into vogue in Germany in spite of the expense and certain legal difficulties which render its performance in some parts almost an impossibility. In Gotha, no fewer than one hundred bodies have been cremated during the present year.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

BINGHAM.—*Ledger*, Nov. 23: The Bingham is a newly developed claim in Pioneer district, lately purchased by Mr. Bingham, who is from the mining fields of Arizona. The prospects of the property are highly spoken of by all who have seen it. There is a large quantity of ore on the dump ready for crushing. It is high-grade rock, estimated to go all the way from $50 to $100 per ton. A mill on the roller principle is being put up. Three heavy wheels revolving in a pan furnish the crushing power. It is calculated to crush from 30 to 40 tons per day. The mill will be operated by steam-power, the boiler and other machinery being already on the ground. The mill is also intended for custom work, thereby supplying a long-felt want in this promising district. A report was current in Volcano this week that ore had been taken out that would go $500 per ton.

CLEANUP.—The last cleanup at the Wildman realized $8000 in free gold. The sulphurets will yield from $1000 to $2000 more. Reckoning the mill to crush two tons per day to each stamp, this would give an average yield of about $8 per ton, a very satisfactory output. There is a large ledge—over 20 feet wide it is said—of the same grade of rock; so that there is good reason to place the Wildman among the solid mines of the county.

Calaveras.

HALLOCK MINE.—Angels *Record*, Nov. 19: Week before last we noticed the Claude mine, the property of Mr. Otto Dolling, which is developing superior values every day, and latterly we have seen some quartz from the same lode and from the claim immediately adjoining it. The samples came from the location of Mr. R. F. L. Hallock, which is the north extension of the Claude mine. We were told, and had good reason to believe from the character of the quartz, that it prospected well. There was a great resemblance between the quartz of the two places, which indicated that a development of Mr. Hallock's property would result in a valuable and permanent mine.

RICH.—We learn from good authority that Mr. Harvy Wood and sons of Robinson Ferry have struck it wonderfully rich in their mine on the river. As much as $50,000 is reported to have been taken out last week. We understand that the lead is four feet wide and the chute thus far 40 feet wide.

Fresno.

COAL.—*Expositor*, Nov. 20: The general agent for the San Joaquin Valley Coal Mining Co., E. Kauntze, informs us that they have just completed four miles of track, connecting the switch at Coalinga on the Goshen branch of the S. P. R. R. Co. with the coal bunkers at the mouth of the tunnels of the Fresno county coal mines. Increase in business and a steadily growing demand has made this important and expensive addition to their mine an absolute necessity. The company run their own locomotive on the branch line, and can at the shortest notice place the loaded cars in position for the regular trains to pull out.

Inyo.

DARWIN.—Inyo *Independent*, Nov. 24: There is very little doing in the Darwin mining district. In the Lucky Jim mine Mr. J. A, McKenzie has a few men at work; in the Defiance there are a few more employed; and this is about all that is doing. Mr. J. C. Eddy is not doing anything in mines at present. Over at Riley, Mr. C. Anthony has got out a good-sized pile of ore for a run at the Riley mill. Late reports from Panamint are to the effect that very little is doing there. At Cerro Gordo, Mr. Farrington is getting tunnels and shafts repaired, and till this work is finished very little else will be attempted.

TAILINGS THAT PAY.—*Index*, Nov. 20: James Rose is working over tailings at Fish Spring that have already been worked three times over blankets and once through a concentrator. He informs us that the result of his last month's run was 10 ounces of gold worth $18 per ounce, and a large quantity of sulphurets estimated at $50 per ton.

Napa.

TEMPORARY SUSPENSION OF WORK.—*Calistogian*, Nov. 24: The Palisade Reduction Works were shut down Saturday night last, and several employes in both mill and mine were informed that their services would not be required in less than a month. Some of them have since left and will not return. Business was suspended, one of the proprietors says, to make needed repairs of machinery, etc. The reduction works had been running regularly for many months, this being the first important suspension of work since their completion. The mine is in good condition, and shows a very large quantity of good ore. The amount that has thus far been mined and milled is exceedingly small in comparison with that "in sight." In fact all, or nearly all, the ore thus far put through the reduction works has come from stopes of the first level.

Nevada.

EMPIRE.—*Telegraph*, Nov. 20: Supt. Geo. Starr of the Empire mine informs us that there is every reason to believe that the Empire has a long and prosperous career before it. The Empire has always been a mine full of surprises and gold. Just when you would think the mine was about worked out, she would soon turn up richer than ever. The ledge opened up in the crosscut of the 1800 level is excellent in its appearance and is the main ledge. The 1900 level will soon be opened up and that alone will give quartz enough for a two-years' run night and day. As soon as the 1900 level is completed, Mr. Starr intends to sink for the 2000 level.

WASHED OUT.—*Transcript*, Nov. 23: The Providence Mining Co. sustained serious damage Friday by the rapid rising of Deer Creek. The rain came down in torrents toward noon, and in half an hour before one o'clock the stream rose a foot. It wore against the waste dump of the Mountaineer mine, sweeping the rock and debris down, and by filling up the old channel diverted the stream into a new one at the south side of the flat. The shifting of the waters undermined the trestle which supports the 20-inch pipe that conveys water from the Snow Mountain ditch to the mine, where it is used for hoisting, pumping and milling. The trestle and pipe for a stretch of 60 feet were washed away and two Chinese cabins on the flat also floated off. This accident will probably occasion a suspension of all operations at the mine for a fortnight or more. The destruction of property and suspension of mining will entail a loss of not less than $5000 or $6000.

THE HARMONY MINE.—*Transcript*, Nov. 24: The local company engaged in developing the Harmony drift claim a short distance from town in a northerly direction are making the best of progress. The contractors have completed sinking the shaft to a depth of 340 feet. A meeting was to be held Saturday evening to award a contract for running a drift due north from the bottom of the shaft a distance of 500 feet, and it is believed this drift will tap the center of the channel. Some gravel, apparently on the rim of the bedrock, was encountered in the shaft above the 200-foot point.

THE FRENCH CORRAL ELEVATOR.—The elevator process of gravel mining is proving a great success at French Corral. The water and debris are raised perpendicularly a distance of 40 feet and run off into settling reservoirs from which the water flows to the river in a comparatively clear state. It took some experimenting to get the elevator to do just what was required of it, but all the obstacles have by patience and science been overcome.

IDAHO MINE.—Grass Valley *Union*, Nov. 19: Some 50 or 60 of the Idaho miners are temporarily laid off, owing to the large amount of quartz that is broken in the mine waiting to be milled. The ledge is large, and the machine drills take down the quartz faster than it can be milled. When the additional five stamps that are being put in the mill are ready to drop, more quartz can be disposed of. The improvements at the mill are going ahead and will be completed at an early day. The excavations for the floor, on which to place the new concentrators, have been completed, and some of the machines set. In all, there will be 16 concentrators placed, ten of which will be the Frue and six Triumph machines. The new improvements will make a valuable addition to the milling machinery of the mine.

Placer.

PICK AND SHOVEL.—*Herald*, Nov. 27: C. F. Reed is opening the Drummond mine. The rock is reported to be very rich. The Oro mine above Michigan Bluff is paying about the same. The present rain will probably start the mill at the Zantgraft mine. This mine, which is situated near the Alabaster Cave in El Dorado county, is one of the best paying quartz mines in the State. The rock has paid steadily and will for years. The pay chute is over 1600 feet in length, the longest in the State. Rock is now being taken from the 350-foot level. The ledge at this depth is three feet in thickness. McCaw & Curtis are fast getting the better of the mud and water in the old shaft in the Bellevue mine at Ophir. The hoisting works at the Eclipse are not quite finished. A contract for sinking the east shaft to a greater depth has been let. F. Aldrich is opening the Black Jack, near the St Patrick. The water has temporarily stopped work at the Moore mine. The owners will put in a whim to raise the water from the shaft. The R. E. Lee mine continues to prospect well. The Baker Divide Co. is still running prospects and drifts above the tunnel.

San Diego.

THE STONEWALL.—San Diego *Sun*, Nov. 21: An expert mining engineer from the northern part of the coast was recently in San Diego, and in speaking of the mines of this county said significantly that he expected to be handling the Stonewall mine in about four months. The matter was brought to Gov. Waterman's attention. "I don't know your man by the description," the Governor replied, "but I might if I were to see him. I have heard that some Englishmen were negotiating for my mine, but can't say what progress has been made. I have bonded the Stonewall mine to ex-Mayor E. F. Spence of Los Angeles for six months, and the time expires on Feb. 11th. The bond is for $2,125,000, and it includes my 21,000-acre ranch, with the mine and mills, the sawmill and from 500 to 1000 head of cattle. Besides, three other ledges have been discovered on the ranch, two of them being very rich, and I may want to develop them. Our new stamp-mill will be in operation by Jan. 1st, I expect, when we shall begin sinking. Although we have not sunk any for six months, there is enough ore on the dump to run the mills a year or two. The new mill will have 20 stamps and the old one has ten. I shall run them both. The ore never showed up so well as it does now. It is worth a trip up there just to see the timbers used for the gallows-frame in the hoisting works. They were all cut from my land. They run 80 feet in length and from 18 to 20 inches in width. The two big engines are now being placed there, the boiler is in and the smoke-stack up. The hoisting capacity is one ton. Each hoisting rope or belt weighs 7500 pounds, and one cage rises as the other descends. The iron cars are loaded with ore, run into the cages and brought up to the platform. Beneath the cage a square and deep iron tank holding from 100 to 300 gallons will be fastened for helping along the two or three steam pumps in getting the water out. This tank has a self-acting valve which opens to let the receptacle fill, and also to permit the water to escape. I am sending two tanks out to see how they will work. The batteries are in place in the mill, which is wholly of corrugated iron, and now nearly done. I am employing now about 200 men, I should judge, which means that from 500 to 600 people are getting their support from the mine."

OWENS.—Julian *Sentinel*, Nov. 24: The Owens mine is now down to a depth of 350 feet and crosscutting to the ledge was commenced yesterday. The shaft is now 50 feet below the old works and it is the first new ground that has been opened up in depth for many years, and good results are confidently looked for by all who are familiar with the early history of the mine.

NEW LEDGES.—Three new ledges, two of which are very rich, have been discovered on Gov. Waterman's ranch near the famous Stonewall mine. The Governor is surely in luck and he is not the man to let those ledges lay there, but he will develop them.

GOLD KING.—Eb Feeler was in from the Gold King this week and reports everything tip-top at the mine.

Shasta.

OLD DIGGINGS DISTRICT.—Redding *Free Press*, Nov. 23; Fourteen months ago Mr. R. G. Hart bought an interest in the Texas and Georgia mine from Mr. Fleming and began the systematic development of the same. Tunnel No. 3 was commenced and is now nearly 500 feet long, having a pay chute 125 feet long and ledge 10 feet wide. Tunnel No. 2 is 320 feet long and has a pay chute of 185 feet. This is a separate pay chute from the one mentioned in tunnel No. 3, which is being pushed forward to connect with pay chute in tunnel No. 2. From tunnel two there is a shaft of 50 feet, from the bottom of which there is a drift 50 feet long where there is a vein of good rock 14 feet wide, part of which is high-grade ore, glistening with free gold. Tunnel No. 1 is 265 feet long and has a 3-foot vein of milling rock. All these tunnels are connected by shafts and upraises, the last upraise being finished on Wednesday, and the mine is in most excellent shape for extracting ore economically and supply a plant of three times the present capacity. This is the deepest mine in the Old Diggings, being 530 feet perpendicular from the apex of the mountain, and the encouraging feature is that the vein is improving in quality as greater depth is attained. Mr. Hart does not propose to stop here, but push ahead tunnel No. 4, which is already 80 feet long, and thereby insure another 100 feet of backing. Yet some people say Shasta county mines don't go down! Mr. Sharp has secured a contract for running a tunnel on the Mammoth mine. Three months ago Mr. Satterlee started the Central mill, crushing ore from the Mammoth dump, and is still running it successfully.

LOWER SPRINGS.—Cor. Redding *Free Press*, Nov. 23; The time is past when late discoveries are looked upon altogether with distrust, and the day is rapidly approaching when the reputation of Shasta as a mining county will entitle all discoveries to a modicum of attention from mining men. Last March there was discovered in Gamblers' gulch, a half mile this side of Shasta, by Messrs. Penrose and Gruber, what seems to be a rich ore vein. Those parties, at least, are jubilant, and shake their heads in a knowing way, showing their confidence in what after hard labor they have discovered. A tunnel 100 feet into the hill has tapped a seven-foot ledge at least 50 feet underneath the earth's surface. The ore extracted is undoubtedly rich in free gold and sulphurets, and has been proclaimed good ore by Mr. W. P. Miller, one of the owners of the Gem, who is perhaps as good a judge of ore as any gentleman interested in Shasta county mines. Of course this mine has not as yet been developed, because the discoverers are poor men, but I am satisfied that under the inspiration of capital this new discovery will develop equally as good as the Gem or Hartman mines.

Sierra.

THE SUN FLOWER.—Nevada *Transcript*, Nov. 21: The mill building at the Sun Flower mine near Pike City is completed and now the machinery is being connected with the power and adjusted. Crushing will begin next week.

Siskiyou.

QUARTZ.—Yreka *Journal*, Nov. 25: The Warren quartz-mill on Yreka Flats, close to town, has been started up again, being run by a portable engine secured from the Prather ranch. Ore from Witherill's mine is now being crushed, and quartz from the lately discovered ledges on Portuguese gulch will also be hauled to this mill soon. The new quartz-mill of the Huntington roller patent, for Boyle & Co.'s Humbug Creek ledge, arrived from below last week, and John Burgess has been busy hauling the different sections from the Yreka R. R. depot to the mine. Besides the mill the company has also several thousand feet of iron pipe for conducting water to mine and batteries. The Shroeder & Werner mine at head of Deadwood creek is being worked more energetically at present by reason of having a better supply of water for the batteries, thus allowing the steam-mill to be kept running day and night. The recent rain-storms have caused all the miners in the dry gulches and hydraulic diggings to get ready for active work, as a very little more rain and snow will give a good supply of water to commence operations. The creek bed and drift miners have a good supply already, and so have the quartz miners, especially those running steam-mills, as they only need a good supply for the batteries. The miners of Hawkinsville, a couple of miles north of Yreka, are hopeful of gaining a good supply of free water, as the mountain-tops along the Humbug range west of Yreka contain snow already, with prospects of more as the winter advances. The miners of this camp have not been able to do much of anything for three years past, owing to the Big Ditch furnishing no water, and the seasons too dry to afford free water.

Trinity.

NEW RIVER.—*Journal*, Nov. 23: G. W. B. Yocum, of New River, gives us the following items: The tunnel being run in on the Uncle Sam cut a fine ledge last week, the quality of which has caused some excitement in camp. Fullmore and Faveren are getting out good ore from the Tough Nut; they have the mine leased. The prospects of the Ridgeway are very favorable. The mill began running last Monday on ore from the mine. The mill is well situated, perfectly appointed and one of the best in Northern California. The Mountain Boomer mill is running steadily on leased rock. The owners of the Sherwood mine are taking out good ore; they have plenty of ore on the dump, but scarcity of water to run their arastra has prevented them from crushing it. This week's rain will probably give them all the water they want.

Tuolumne.

JAMESTOWN.—Tuolumne *Independent*, Nov. 23: The Dutch mine, formerly owned by Messrs. Preston & Hill, and which has lately been purchased by the Fitzgerald Bros. and Lucas, has been leased to Chas. Lane, of Angels Camp. Under the present lessee the mine has started up in full blast, with Mr. Brigham as superintendent, and Mr. Wm. Garrod, of Angels, as foreman. In connection with the mine, the proprietors have purchased an engine, and everything connected with the mine is in first-class condition; even the miners are No. 1, and they are pushing the work forward with great zeal. At present they are drifting, but will soon be engaged in sinking a shaft. The ore is transferred from the mine to the Heslep mill, and rumor has it that the present owners are highly delighted at the flattering prospect. Although this mine has been idle for years and years, still the indications are favorable for large returns of bullion.

ALAMEDA MINE. — *Union Democrat*, Nov. 23: The development work now being done on this mine, situated on the mother lode to the north of Jamestown, speaks well for success in the early future. The shaft going down from the tunnel driven by former owners is in high-grade ore. At the Patterson mill one sample ton was worked last week and gave the large yield of $140, and it is reported on good authority that ore still better has been found at the bottom of the shaft. An upraise from the tunnel has been made and the hoisting works will be placed on the surface at the mouth of the shaft.

RAWHIDE. — Arrangements are being made to work this mine, also situated on the mother lode and near the Alameda, on a large scale at an early day. Mr. Neville, the late purchaser, is expected to arrive in Sonora in a few days to start the work. The mine has a first-class 20-stamp steam mill on it in perfect order. Those who know the mine best speak strongly of its merits and sure success with proper management.

PAGE.—It is reported that the purchase of this mine, situated in this county and near the south fork of the Stanislaus river, is now being entertained by San Francisco parties. The mine has a five-stamp water-mill on it. The mine has yielded largely in the past and has great merit in the opinion of competent mining men. It has a fine water-power, the pay chute is unusually long, and the vein strong and well defined. The grade of the ore is above the average of California paying mines, varying from $15 to $18 per ton in free gold. The mine should be in strong hands and vigorously worked. It is opened by tunnels and no pumps or hoisting works are required.

HYDE.—The superintendent of this mine, Mr. Maxwell of S. F., staid several days at the mine last week and expresses himself satisfied with the good prospect it shows. Work will be energetically pushed on the mine by the owners, who lately purchased it and who are men of large means.

NEVADA.

Washoe District.

SIERRA NEVADA.—Virginia *Chronicle*, Nov. 23: On the 520 level from the main east drift, 1185 feet from the shaft station, a south drift is advanced 552 feet. At a point in the south drift from the east drift, 275 feet from the main east drift, a drift is advanced 52 feet, the face in porphyry and clay.

UNION CON.—On the 1465 level in the north lateral drift 50 feet south of the north line of the mine, west crosscut No. 3 is advanced 53 feet, continuing in porphyry.

MEXICAN.—On the 1465 level from the north drift from west crosscut No. 1, 50 feet in from the lateral drift face, a west crosscut is advanced 134 feet, continuing in porphyry, clay and quartz.

OPHIR.—On the 1300 level from the end of the east crosscut from the shaft station a south drift is advanced 28 feet. Formation vein porphyry.

CON. CALIFORNIA AND VIRGINIA.—From the stopes on the 1300, 1435, 1500, 1600 and 1650 levels continue to extract ore sufficient to supply the Morgan and Eureka mills. During the week 1100 tons and 1820 pounds of ore were shipped to the Morgan mill, 1207 tons and 1140 pounds to the Eureka mill. The average assay value of all the ore worked at these mills during the week, according to battery samples, was $26.05. Bullion valued at $15,500 is now on hand. Shipped $65,379.24 to the Carson mint.

UTAH.—On the 600 level the southeast drift is advanced 324 feet from the shaft station. Formation porphyry.

OCCIDENTAL CON.—During the week extracted and milled 330 tons of ore showing an average assay value of $18.20 per ton. Shipped to San Francisco bullion valued at $6137.50 and have on hand concentrates valued at $12,000.

NORTH OCCIDENTAL.—Extracting ore from the 300 and 400 levels. On the 300 level a south drift is advanced 11 feet from west crosscut No. 2 and is in quartz showing value.

GOULD AND CURRY.—On the 200 level, the southwest drift is extended 138 feet, soft porphyry continuing.

BEST AND BELCHER.—On the 625 level, in the north drift, 70 feet north of the south line, an upraise is carried up 30 feet, the top in quartz and porphyry.

HALE AND NORCROSS.—Shipped to the Nevada mill during the week 1005 tons of ore, showing an average value of $30.07 per ton by pulp assays. Bullion valued at $46,577 on hand and shipped to San Francisco.

CHOLLAR.—Crushed 450 tons of ore at the Nevada mill during the week. The 500 level northwest drift continues in low-grade quartz.

POTOSI.—There is an improvement in the quality of quartz being stripped on the 850 level.

BELCHER.—Nos. 2 and 3 east crosscuts on the 1200 level are in low-grade quartz. From the 1000 level east crosscut, No. 1, a south drift is showing quartz assaying from $5 to $12 per ton. The 850 level south drift is in porphyry.

SEG. BELCHER.—The 1200 west crosscut 20 feet north of the line is in 60 feet, showing porphyry and clay.

SILVER HILL.—No change in formation in 160 and 260 level explorations.

BALTIMORE.—Usual progress is made in advancing 338 and 225 level explorations.

JUSTICE.—Crushed 225 tons of ore showing an assay value of about $30 per ton from pulp samples.

NORTH GOULD AND CURRY AND EAST BEST AND BELCHER.—The west drift from the northwest drift continues in vein matter carrying streaks of quartz.

IMPERIAL.—The joint Confidence-Challenge 500 level east crosscut from the north drift is in clay. The joint west crosscut continues in quartz and porphyry. The joint 800 level north drift is in clay.

YELLOW JACKET.—Daily ore shipments have been increased to 70 tons, battery samples showing an average assay value of $22 per ton.

ALPHA.—The station on the 600 level of the shaft is completed. The 500 level west crosscut continues in quartz and porphyry.

EXCHEQUER.—The 382 level east crosscut is in porphyry and clay and the 500 level north line west crosscut continues in quartz.

WARD COMBINATION SHAFT.—The 1800 level west drift is advanced 48 feet.

OVERMAN.—Shipped 317 tons of ore to the Vivian mill during the week.

NEW YORK CON.—The raise above the 800 level west crosscut continues in fair quality ore.

EAST SIERRA NEVADA.—The 520 level south drift is out 478 feet.

SAVAGE.—Shipped 471 tons of ore, battery sample assays showing an average value of $26.50 per

ton. Daily shipments have been increased to the full crushing capacity of the mill. Bullion on hand valued at $20,948.

CALEDONIA.—The southwest drift is advanced 34 feet, porphyry and clay still showing in the face.

CROWN POINT.—Shipped to the Mexican mill 566 tons of ore, showing a value of $16.85 per ton by pulp assays.

Goiconda District.

CONSIDERABLE ACTIVITY.—*Silver State*, Nov. 20: The probability that silver will advance in price, and that the Demonetization Act of 1873 will be repealed this winter, is having a noticeable effect on the mining industry. At Goiconda, mining men from different parts of the country are looking at old claims, buying some of them and making new locations. The Great Republic has been sold to an English company, and a force of men has been set at work on the Cumberland. A Mr. Choate, an experienced miner, has secured several claims in the district and intends to commence developing them shortly. Should silver go above a dollar an ounce, it will give an impetus to mining in this section that will restore life to depopulated mining camps.

Morey District.

SHIPPING.—Belmont *Courier*, Nov. 23: Rich ore is being shipped to Salt Lake City from Morey, Nye county. The mines in that district continue to look uptop.

Osceola District.

THE PLACERS.—Virginia *Enterprise*, Nov. 22: The Osceola placer mines lie about 30 miles due east of Robinson district, on the western slope of Jeff Davis peak, the highest peak in Nevada. At that place Godby & Hampton have 180 men digging the large canal to bring water from the mountains to the gold placer diggings. The canal will be 18 miles in length, 6 feet wide at the top, 2 feet deep at the lower side, and 4 feet wide at the bottom. Miners are given $2 a day and board.

Pioche District.

RAYMOND BLACK LEDGE WINZE.—*Record*, Nov. 16: But comparatively slight progress was made this week in draining the Black Ledge winze at the Raymond mine. By tanking and pumping, the water was steadily gained upon, and three days ago a depth of about 120 feet was attained, passing the 13th station and emptying the drifts there, when early Thursday morning the new steel cable used in operating the tank parted, and the tank was lost down the winze. During Thursday and part of Friday the small pump alone was relied upon, but though worked to its fullest capacity it failed to hold the water down, and forced a retreat of about 15 feet. The water coming in is thought to be largely seepage from the ledge. It is believed that the small pump now in use will prove capable of handling the water when once the winze and ledge are drained. A new tank was hastily built, and yesterday tanking was resumed. The upraise from the 12th level on the Black Ledge has progressed 110 feet, the character of the ore having steadily changed. From a black base ore it has turned to a yellow or brown free ore, containing no sulphur or zinc, and but little lead. The ore averages 100 ounces in silver per ton. The winze at this point is four feet wide, and the walls of the ledge are not found on either side.

YUBA.—At the Yuba about 12 tons of ore and 38 tons of waste are hoisted daily. This work will be kept up until the station at the 350-foot level is finished, when the capacity for hoisting ore will be about trebled. The hoisting engine at the station is now being placed.

Robinson District.

WHITE PINE'S GOLD CAMP.—Reese River *Reveille*, Nov. 20: J. C. Irvine arrived here from Kingston on Saturday's stage, having returned to Kingston from his White Pine trip last Thursday. Learning that he had spent two days examining the Robinson district over which there has been a big gold excitement, we obtained the following facts from him, as he obtained them from a close personal inspection. He said: "A. R. Watson, the discoverer and owner of the Johanna gold mine, has sunk an incline in the bed of the canyon, on the south side, to the depth of 60 feet, and has stripped 150 feet on each side of said incline on the course of the vein. The ledge averages 5 feet in width, and in 24 hours 20 tons are taken from the mine and hauled to a 10-stamp mill run by water-power. In a run of eight days, the mill shipped gold bullion valued from $2500 to $2800, the gold worth at the mint $17.50 to the ounce. Sol Hilp showed me a gold nugget taken from three pans, washed out of the rich streak, that went $36, that is averaging $12 to the pan. The gold belt is about two miles in length and a half-mile in width, and in it there are many prospects which show gold. I understand that Watson was offered $50,000 for the Johanna mine in cash, and $50,000 more as it was taken out of the mine, which he refused. The mine, as far as prospected, shows the ledge to be uniform and well defined. Watson is working about 15 men, and it is by his endurance, perseverance and energy that he has got it rich to-day. This district is about two miles from Ely, the county seat of White Pine county, the vein running east and west in Robinson canyon. All the outside claims have been located, and as far as I can judge from the present development, it is one of the best prospects for gold in White Pine county or Eastern Nevada. Of course, everybody feels good over the gold strike, and if it turns out to be permanent, White Pine county will be given another start, and prospecting will again be pursued energetically."

Tuscarora District.

NORTH BELLE ISLE.—*Times-Review*, Nov. 23: The station at the 600-foot level has been cut out, and sinking the shaft for a sump has been resumed.

NAVAJO.—The stopes continue to yield the usual amount of ore; those above the 150 foot level show some improvement.

BELLE ISLE.—West crosscut, 250-foot level, extended four feet, and a drift started south at a point where rich ore was found.

NEVADA QUEEN.—South intermediate drift from 150-foot level of Commonwealth has been run 17 feet, in vein formation, assaying $27 per ton and is looking favorable.

NORTH COMMONWEALTH.—Joint crosscut, 225-foot level, extended 18 feet; the face continues to look favorable.

GRAND PRIZE.—A crosscut has been started north from the west drift, 500-foot level, to intersect the winze put down from the 400-foot level in the west vein. The stoping of concentrating ore has been discontinued.

DEL MONTE.—Joint crosscut, 225-foot level, extended 18 feet. North drift, 100-foot level, extended four feet, showing some high-grade ore.

COMMONWEALTH.—100-foot level: North drift from No. 1 east crosscut, advanced 24 feet; total, 112 feet. Average assay from the face, $314 per ton. This drift is 60 feet east of the upraise from No. 1 north drift, where very high-grade ore has been developed. No. 2 east crosscut extended 22 feet; total, 49 feet. Will have to be driven about 12 feet further to reach the ore, as it has turned to the east in the north drift. The Grand Prize concentrating plant will start on Commonwealth ore Monday.

Tybo District.

GOOD ORE.—Belmont *Courier*, Nov. 23: The Gilmore Bros. are encountering good ore in their mine at Tybo.

DIMICK.—Work in the Dimick, at Tybo, is progressing finely, and the mine is yielding large quantities of good silver ore.

ARIZONA.

MOHAVE NOTES.—*Miner*, Nov. 23: There are five ore assorters at the C. O. D. employed on company ore. Geo. M. Bowers has a force employed on his Golden Stairs gold mine, Layne springs. The Nighthawk mine, Layne springs, has been closed down after one of its most successful runs since it was opened. Theodore Myers, lessee at the C. O. D., is taking out very high-grade ore, and will soon have a shipment that will net him some money. N. C. Amer has the ordinary force at work on the Silver King, C. O. D. basin, and is taking out a good grade of ore and making the usual shipments. McDuffee & Heimrod continue to find ore in their Rustler mine, Blowpipe Flat, Chloride. Although the quantities they get are not large, the grade is exceedingly high. There has been a fine body of ore struck in the gold mine above the C. O. D., owned by John Sandoval, but of the value and extent we are at present unable to learn. John Barry is running his gold mill at Cerbat on ore produced from the extension of the Flores. Everything is progressing satisfactorily, and a good run is anticipated. John Marshall continues taking out considerable quantities of good ore from the Jamison gold mine, Layne springs, a carload of which was worked at the sampler last week and gave satisfactory results. Brown, Rule & Co. are taking out some good ore from the Rural mine, Mineral Park. It would not be the least surprising, and in fact indications seem to point in that direction, that another rich and large body of ore will be encountered. Sample & Jamison are highly pleased with their Rip Van Winkle mine, Layne springs. As the tunnel advances, the ore body becomes wider and of better grade, they now having 12 to 14 inches of good ore, the first class of which will sample 600 ounces. Joe Boland and Joe Prisk have a contract to sink the shaft of the Esmeralda gold mine, Cerbat, 50 feet. This will make the total depth of the shaft about 165 feet. They have encountered two feet of $60 ore which is very flattering. This mine is owned by O. F. Kuencer and Chas. Gross. Barney McCall and Dan McKinnon are prospecting north from the north shaft on the Sunset mine, Chloride. They have out a small quantity of very high-grade ore which will soon be shipped.

YAVAPAI. — Cor. Prescott *Courier*, Nov. 19: Mines in this county are keeping up their ancient reputation for richness. From John Curtin, who came in yesterday from Slate creek, Hassayampa district, we learn that the Mark Twain, Blue Dick and Dosoris mines are yielding a great deal of very rich ore. Mr. Curtin and his partner took $1000 worth of rich ore from the Mark Twain in a very short time. The Blue Dick is also producing fine ore. The Dosoris is looking well, so well, indeed, that the working force was recently increased. Mr. Flint tells the same story about ledges near the head of Hassayampa creek. The Ryland, the Crowned King, Harlan's, the Mocking Bird, the Etta, Dixie and Joe Chambers mills are running. So is the Congress, and only the want of water keeps the Oro Bella mill idle. Chloriders of Tip Top district are shipping more ore than ever before. United Verde mines, carrying gold, silver and copper, are all the time producing bullion. Miners of small means are taking ore from many mines and shipping it to smelters in Colorado, so that everything in the mining line is encouraging. One hundred dollars a week is what Fred Satters has been making in a quartz mine near Prescott.

COLORADO.

THE MOLLIE GIBSON.—Asher *Times*, Nov. 20: The Mollie Gibson proper is one of the very old locations of the district. Very little development had been done on the property until Gillespie & Shear started it up. They ran into large bodies of low-grade lead ore and determined to put up a concentrating mill to treat it. This mill was finished early last spring and work on the mine was then resumed. In a short time after work was started up the wonderfully rich ore that has made the mine famous was discovered. The ore was the richest that had ever been mined in the camp, and it appeared in such quantities that the community went wild over it. The new arrangement is nothing less than an immense consolidation which takes in over 2500 ft of the contact and covers an area of 53 acres. The consolidation has been made between the Mollie Gibson M. & M. Co. and the Aspen Contact M. Co., under the name of the Mollie Gibson Con. M. & M. Co. The territory acquired covers the lode southward from the Mollie Gibson about 1000 feet and takes in a large part of the flat along the river.

FUTURE PLANS.—In speaking of the company's plans for the future, Manager Bulkley stated that the general idea was to gain depth, and in pursuing this plan the energies of the company would, for the present, be devoted to sinking the incline from the bottom of the main shaft. The rich ore chute was found on the first level less than 300 feet north of the shaft. Its trend to the southwest is so sharp that Mr. Buckley believes it will be intercepted by the incline before a very great depth is attained, and it is not impossible that it may again be a bonanza at that point. Crosscuts will be run every 100 feet to prospect the lode to the hanging-wall.

MILL.—The new company also owns the concentrating mill which is located on the Roaring Fork near the mouth of Maroon creek. Since the new company took hold of it the mill has been considerably improved. A new 35-horse power boiler has been added to the plant, two new concentrating tables have been put in, the dryer has been enlarged and some additions have been made to the building. By these improvements the capacity of the mill has been increased, being now about 40 tons per day.

DAKOTA.

HAVE RESUMED WORK.—Deadwood *Pioneer*, Nov. 15: Carpenters at reduction works and syndicate smeltery resumed work again yesterday morning, making excellent headway during the day. It won't be long before at both places buildings will begin to loom up.

SOME GOOD ORE.—John McVeal and associates have completed assessment work on the Sunnyside, Black Moon and Cygnet locations, Terry's Peak. In doing the work required by law, ore of much better quality than the mines were before known to contain was discovered. The average is good enough to stand shipment, while a six-inch vein running through the main ore body returns assays of from $300 to $500 per ton. Present owners were original locators of the properties; have stuck to them for ten years, and deserve the good luck now before them.

MILLER SMELTERY.—Deadwood *Pioneer*, Nov. 26: All machinery and material for the plant is now at the site, the last having been received yesterday. Engineer Shaw has commenced setting up the engine and boiler, having a force of six men employed yesterday afternoon. The building is nearly completed, tinners beginning to-day to put on the corrugated iron roofing. Contract was yesterday let for 100 tons of pyrites to be delivered at the plant. Two galena mines will furnish them reduction works. Col. Carpenter's works are beginning to loom up. It is now believed the plant will be completed in time to begin treatment of ore by the 1st or 10th of January.

IDAHO.

CENTERVILLE.—Cor. Idaho *World*, Nov. 23: A telegraphic dispatch was received here several days ago from the East directing acting Superintendent Cunningham to ship immediately necessary winter supplies for 15 men to the Elkhorn mine. The mine is showing up well. In the upper tunnel they have a fine four-foot ledge, supposed to be a continuation of the ledge Mr. Turner worked last winter, as it is the same character of quartz and prospects fully as well. In the crosscut run 300 feet from the entrance of the lower tunnel a very rich eight-inch seam has opened up and quartz is being run into the mill at a rapid rate. The mill will start up in a week or 10 days and probably run all winter. All outside work is done. Mr. Jordan of Boston, owner of the Gladstone, Oro Fino and Revenue, while here last month, was very favorably impressed with the general outlook of his mines, and will have a force of men at work early in the spring. Bono & Co., owners of the Western Wonder mine, located on Elk creek opposite Ross Fork, and about one mile below the Elkhorn, have, owing to exorbitant rates of exchange between here and the East, suspended operations for the present on this very promising prospect. Oakes & Poncio have made extensive preparations for winter work on their Pioneer mine. Capt. Bruce and Fred Hammersly will run a tunnel on the Sunbeam. This property was discovered the past summer. A number of crosscuts have been run on top for a distance of 800 feet, and in every cut the same rock was found, and it is rated at $30 per ton. Steve Dempsey has his placer claims ready for the spring run. Smith and Williams have finished work on their placer claim near the Golden Star mine.

DEVELOPMENTS.—Silver City *Avalanche*, Nov. 20: Much more development work has been done on the quartz mines in this county this year than for several years previous. Many more prospects have developed into fine properties.

TO COMMENCE OPERATIONS.—*Avalanche*, Nov. 20: Mr. Dan Feour, an old-time miner of considerable experience, has been selected as foreman of the Black Jack and Empire State mines recently purchased by the Pittsburg Co. Mr. Feour informs us that he will commence active operations at once. The force employed now is about 15 men, and more will be added as the work progresses.

MONTANA.

ELKHORN TUNNEL.—Ketchum *Keystone*, Nov. 20: It is reported that the tunnel that Messrs. Gregory & Thomas have been driving for so long a time to tap the old Elkhorn mine at a greater depth, has encountered some ore, and that the face of the tunnel is looking very favorable and encouraging. There is no doubt that ore bodies will be developed in the Elkhorn mine at a greater depth, which will surpass any that has heretofore been found in the upper workings of the mine. We trust that all the sanguine expectations concerning the undoubted wealth of this mine may be fully realized, and that those who have had such unbounded faith in its future may ere long be amply rewarded for their toil and untiring perseverance.

THE OLD LEXINGTON MILL.—Butte *Miner*, Nov. 20: R. B. Wallace has taken a lease and bond on some property in Park canyon, and will in a few days commence hauling ore from it to the old Lexington mill, situated on East Broadway, for the purpose of reducing it. Mr. Wallace has leased the mill, and will not only work the ore from Park canyon, but will do custom work as well.

THE GAGNON.—This is a close-mouthed company, and consequently but little information can be gleaned as to what is going on below the surface. The shaft on the Gagnon is down 800 feet, and a level nearly 1250 feet in length has been run west of the shaft. It is from this level that ore is now being taken, some of which is a high-grade galena. The mine and works above are lighted by electricity, a small dynamo owned by the company generating the current. A small engine has been placed in the works for the purpose of operating the dynamo and the new rotary blower for the forges in the blacksmith shop.

THE GOLDSMITH.—The Goldsmith, the property of George Tong, is only beginning to be developed. The shaft is down 400 feet, and levels have been run only east of the shaft. The ore now being taken from the mine is stoped from the east 220-foot level. From the bottom of the shaft a level is being run and is now in about 115 feet. The ore of the Goldsmith averages all the way through 60 ounces silver per ton. The property is a good one, and thousands of tons of ore will yet be taken from it.

BARKER DISTRICT.—Cor. Great Falls *Tribune*, Nov. 20: The situation has been greatly altered for most of the people in the camp. Before the railroad started, if a miner wanted a grub-stake, he had to go to Great Falls and sell a prospect (if he could) to get it; the purchaser had to come out and look the ground over, see how badly the miner is in need, and give him a layout accordingly. Now we have our own merchants, and mining property is on the rise, with plenty of eager buyers, and a miner can at once look a capitalist in the face as though he were an acquaintance or some one as good.

NEW MEXICO.

COSTLY EXPERIMENTS. — *Southwest Sentinel*, Nov. 23: The Aztec and Pacific concentrating mills just above town are idle and likely to remain so. The Aztec Co. has mortgaged all its property to raise money to build some other form of mill, and it is said the Pacific is raising money for the same purpose. Each of these companies could have determined what kind of mill it needed by shipping large quantities of ore to good mills. The cost of such experimenting would have been trifling compared with the sum which has been spent in determining the fact that the concentrator is not the mill they want.

RUBY SILVER.—Silver City *Enterprise*, Nov. 23: Development work on the Ruby Silver will be pushed with renewed vigor. Machinery necessary for sinking the deep shaft is en route to the mine. Mike McDonald, who is leasing on the Red Cloud at Bullard's peak, was in this week, and bought 200 ore sacks. He has plenty of good ore in the mine. The Aztec will soon resume work under the management of Frank Bell. Jo Sheridan was up this week from his Cow Springs mines. He will push development as rapidly as possible, and before spring will have a Huntington mill in operation on his property. From Henry Brixner, just in from the Mogolions, the *Enterprise* learns that the Silver Creek mines are doing excellently. Frank Vingo, who has leased 500 feet of his mine to Peebles Bros., for one year, is paying them $1000 a ton for selected ore from their ground.

THE BAILEY-EPLEY STRIKE.—John M. Wright visited Carlisle last week, and purchased an interest in the new strike. He is very favorably impressed with the strike, but has had too much experience in mining to be anything but conservative. To an *Enterprise* man he remarked: "There are two leading claims, the Imperial and the Jim Crow. They join each other and together form a 3000-foot section of a great quartz lode that can be traced for six miles by the croppings. There are five openings along an extent of 2000 feet, each showing mineral of high grade. Several parties have sampled the shaft of the Imperial, getting an average result of from $275 to $325 per ton."

OREGON.

CLOSED.—*Bedrock Democrat*, Nov. 20: The Bonanza mill has again closed down on account of the scarcity of water, and the crushing of ore from the Worley mine will be delayed until spring. We were shown yesterday by Mr. Francis Clarno a gold brick valued at $60—the proceeds of free gold from four tons of ore from the Worley.

A NEW FIND.—Francis Clarno of Portland returned a few days since from the Greenhorn district and brought with him a quantity of samples of ore from a new find on Clear creek, a few miles from the Golden Monarch mine. The ores are from a group of mines, viz.: The Straussburg, carrying sulphurets; Little Chief and Big Chief, carrying free gold; and the Big Bluff, Silver King and Kingston, whose ores are wonderfully rich in silver deposits. Mr. Clarno has just closed the purchase of these properties in the interest of the Portland Mining Co., of which he is one of the principal stockholders, and that company will undoubtedly begin extensive development work on these mines in the spring. The properties are as yet but little developed, but the work thus far shows a wonderful deposit, and it is certain that depth will only enhance their value.

UTAH.

CREOLE.—*Park Record*, Nov. 23: On Wednesday a strike was made in the Creole No. 2 mine which it is hoped and believed will develop into a producing mine. This property is situated on Treasure Hill, on the west side of the town. Some time ago Charles and Frank Cole, two Cottonwood miners, obtained a lease on the property and ever since then have been working it.

The property is opened up by an incline tunnel which is in about 250 feet. Recently a west drift from near the face of the tunnel was run and on Wednesday a ledge averaging four feet in width and carrying a six-inch pay streak was encountered. The drift was started in a quartzite formation, and the perpendicular distance from the surface is about 200 feet. The ore is a carbonate, a picked sample of which assayed 53 ounces silver and 56 per cent lead to the ton.

PROGRESS OF THE TUNNELS.—The Ontario three-mile drain tunnel is in a distance of over 2700 feet and the work, under the direction of the veteran tunnel-driver, Mr. John Keetley, is progressing satisfactorily. The Alliance's 4800-foot drain tunnel driven by Contractor Judge has reached a distance of about 1800 feet and the work will be finished by next June. The McCune tunnel on the "east end" is being driven by a double shift of workmen and is in nearly 1600 feet. They are in a quartzite formation, having passed the lime about 25 feet back.

THE RICH WASATCH.—Some ore recently found in the Wasatch assayed from 90 to 884 ounces silver and 10 to 45 per cent lead to the ton, and indeed some of the richest ore ever taken out of the mines here is not much if any ahead of what the Wasatch, the coming bonanza of Blue Ledge district, contains.

ORE AND BULLION SHIPMENTS.—During the week the Mackintosh sampler received and forwarded 20,190 pounds of Woodside ore; 73,360 of Ontario; 156,000 of Daly; 166,290 of Woodside concentrates from the Union concentrator, and 205,930 pounds of Mayflower No. 7 leasers' ore; total, 621,770 pounds. The Ontario bullion shipment for the week was 38 bars, containing 18,953.16 fine ounces of silver,

MECHANICAL PROGRESS.

The Paris Iron Exhibit from an English Standpoint.

A very interesting and suggestive report was taken to England by the party of Black Country workmen who visited the Paris Exhibition. This report deals with the character of various iron and steel goods of British and foreign manufacture. Naturally the operatives must be supposed to speak with some prejudice in favor of the products which they themselves have some hand in producing; but they drew attention to the *defects* of English exhibits as well as to their excellencies, and they admit that in some respects the English have a great deal to learn from their foreign competitors. The English correspondent of the *American Manufacturer* summarizes as follows:

Nuts and Bolts.

These workingmen comment critically upon the appearance of the machine-made nuts and bolts used in Continental machines. Even in some very special exhibits, where the rest of the work was good, the fraise was left in the nut, disfiguring the whole machine. They were also badly fitted, as much as the thickness of the thirty-second part of an inch being apparent in the screwing up; even the best bright-polished nuts would, if turned out of Darlaston or Smethwick in such a fashion, be considered very unsatisfactory. The English nut and bolt maker, it is concluded, has nothing to fear from foreign competition, unless it be with regard to price.

Spades, Shovels and Edge Tools.

The deputation reports that there was a good show of spades and shovels of foreign manufacture of various shapes. These proved the need there is for English manufacturers to keep abreast with the times, so as to adapt their shapes to the various uses for which they are intended. In the edge tool exhibits the delegates think that Sheffield showed itself to be still in the van. In tubes and fittings the English exhibits were disappointing both in quantity and quality.

French Workmanship.

In castings the French are said to be marvelously clever, and some of the fine work scarcely needed dressing. The opinion of the deputation with regard to locks was that to compete successfully, English makers must pay more attention to outside show and finish. English work is more substantial in many respects, but it is not so "eyeable." The same judgment is given in the case of chains, nails, and other iron and steel manufactures. The foreign files and rasps were most beautifully finished, and in this department Englishmen must look to their laurels.

England's Deficiencies.

The general conclusion to which these operative observers have come upon the vexed question of English general industrial efficiency is on the whole favorable to British pretensions. As a nation, England, they say, has little or nothing to learn from the French or from any other nation, in respect of science or its application to industrial purposes. But in regard to the best and most useful adaptations of high art for every-day uses, it has to be confessed that England is still behindhand when placed in comparison with the French. The delegates are nevertheless of opinion that in their own particular trades English workmen can meet the French on their own ground with equal excellence all round.

MORE EXPERIMENTS WITH POWDERED COAL.—Erastus Wiman and others are experimenting with a new process of heating iron with powdered coal instead of natural gas. The experiments are being conducted at the Vesuvius Iron Works, Pittsburg, and are said to be satisfactory. Speaking of the test, Mr. Wiman said: "It is as yet rather limited in its scope, but eminently satisfactory in its results. One heat consumed 684 pounds of pulverized coal. The quantity of iron heated by that quantity of fuel was 4600 pounds. We are confident, from the present results, that we can heat iron at 50 cents per ton, including the cost of pulverized coal, while the existing rates for natural gas at the different mills make the cost of heating iron upward of $1 per ton. While a contrast test was not attempted, the lack of facilities necessary for the perfect operation of the new experiment rendered the test successful in only a limited degree, but sufficient to prove that we can produce the same quantity of iron with the pulverized-coal process in an hour as the natural gas facilities at present afforded can produce in two hours. Of course, while the tests thus far have proven satisfactory, unforeseen difficulties may arise in the future, although we feel confident of ultimate success in a very short time." The tests will be continued in order to remove all doubts as to the success or failure of the plan.

A FAITHFUL MECHANIC.—Jay Harper, a blacksmith of North Harpersfield, has stood by the same old forge in the same old shop almost every week day for 38 years. The old shop and tools show marks of service. The floor where Mr. Harper stands by the forge has worn through twice, the bellows handle that was made when he commenced business is still used, but it has worn off until it is sharpened to a point by the constant wear of his hand upon it. A hickory hammer handle shows the impression of his thumb and fingers from long and continuous use. The brick of the forge chimney have been worn away more than an inch by wagon-tires being turned against it while heating on the forge. The cinders that fall from the hot iron when pounded have been allowed to accumulate around the anvil-block all this time, to the amount of 10 or 12 bushels. The large pine tree that now overshadows his shop was but a sapling when he commenced business. —*Courier.*

UNCONSIDERED STATEMENTS.—Statements in regard to mechanical or engineering matters which are either unconsidered, or which emanate from those who are densely ignorant of the subjects upon which they presume to write, are constantly met with in commercial journals or such papers as are not specially devoted to technical matters. Sometimes the poor proof-reader is made to bear the sins of the writer. As a case in point, we would refer to a communication of a writer who evidently accompanied the late American workmen's delegation to the Paris Exposition, who wrote something in regard to the size of the ports on English engines. Now it is evident that when the intelligent proof-reader came to this passage, he knew at once that posts were what was meant instead of ports, and he changed it accordingly. Of course he knew that no vessels ever sailed into a locomotive, and how could it possibly have any such thing as a port about it? Then the New York *Times*, whose articles relating to the new navy have upon the whole been very creditable, recently informed us that the trial of the "Yorktown was made on 8152 pounds pressure," and that there were "2385 square feet of heating surface horse-power." The Baltimore, we are gravely informed, made "one horse-power for each 1857 square feet of heating surface."

INCREASING THE DENSITY OF STEEL.—In working steel by hammering, or drawing it down by the process of rolling, it is a well-known fact that the steel forming the corners becomes more dense by the operation, or has the appearance of being refined, for where drills for cutting stone are used they are found to work much better by having the bit or cutting edge come in line with these compressed edges. In rolling eight-square steel, the line of dense metal comes in the form of a Maltese cross, and as the bit of a rock drill, where power-drilling is made use of, is something of the same form, care is taken to have them coincide. The etching process must show this action of steel to perfection, if a section could be worked off true and even and polished. After hardening, the etching fluid will take hold of the softer metal with greater freedom, and bring out all the features that can be contributed to the action of the hammering or the refining from the rolling operation.

THE COMPOUND LOCOMOTIVE for the Baltimore & Ohio R. R., recently turned out by the Baldwin Locomotive Works of Philadelphia, Pa., has four cylinders, a high and a low pressure on each side; the former is placed above the latter, and both piston rods are connected to the same crosshead. The cylinders are 12 and 20 inches diameter, 24 inches stroke; driving-wheels, 66 inches diameter. The boiler is 60 inches diameter, with a firebox nine feet long for burning soft coal. The engine is designed for fast passenger service. The plan of construction has been patented by the Baldwin Works.

CHINESE ARSENALS.—The Chinese have established arsenals for the manufacture of cannon; but, according to a report recently made by the Chief Justice of the Province of Canton to the Emperor, not one of the arsenals has yet manufactured a single gun where the metal for the same has been either forged or rolled in China. He concludes his report by urging upon the Government the necessity of purchasing improved machinery from abroad for various industrial purposes now worked by hand, and especially for forging and rolling iron and weaving of cotton.

POWDERED COAL.—The experiments in the economy of burning powdered coal side by side with natural gas, recently made at the works of Moorhead Bros. & Co. at Pittsburg, were limited in extent, but successful as far as they went. The amount of coal consumed in the first test was 684 pounds, and amount of iron heated was 4600 pounds. The charge for natural gas is at the rate of $1 per ton of iron, while the cost under the new process it is claimed would not exceed, including pulverization, 50 cents per ton of iron.

THE EIFFEL TOWER AN AMERICAN IDEA.—M. Eiffel, the designer of the famous French tower, acknowledges that he obtained the idea of building it from the fact that a tower 1000 feet high was proposed for the Philadelphia exhibition of 1876, but the project was abandoned for some unknown reason, probably on account of the cost, which was estimated at $1,000,000.

TEMPERED COPPER.—Copper, tempered by the process lately discovered, is found to possess most remarkable strength and wearing qualities. It will be especially valuable for use in the bearings and commutators of dynamo machines, and also for the journals of locomotives and cars. An establishment in Pennsylvania is now placing the metal upon the market.

SCIENTIFIC PROGRESS.

Coloring Matter of Rocks.

The principal coloring matter in such of our rocks as are used for structural purposes, says Geo. P. Merrill in *Stone*, is iron in some of its compounds, or carbonaceous matter. To the iron oxides are due the buff, yellow, brown or red colors; to the carbonaceous matter the blue-gray or even black colors so common in limestones and marbles. Upon the condition of the iron is dependent the degree and intensity of colors as displayed in both fragmental and crystalline rocks. The buff, red and brown stones contain it in a more or less hydrated sesquioxide state; the gray, on the other hand, often contain it as a protoxide, carbonate, or the form of a sulphide. Now, any of these latter forms are liable to undergo a change on exposure to heat or to ordinary atmospheric conditions. It is to this fact that is due the yellowing or mellowing of such sandstones as those of Berea, Ohio. The stone when quarried from below the water level is uniformly gray. On exposure it becomes yellowish, owing to the absorption by the iron of oxygen from the air, whereby it is converted into the sesquioxide state, which is of a reddish-brown color. If the change is uniform throughout the stone, the transformation is rather pleasing than otherwise, imparting a warmth or mellowness that is in no way detrimental. In sandstone, too, such a change may result in the even dissemination of the ferruginous oxide in such a way as to serve as a cement to the individual grains, thus increasing the tenacity and durability of the stone. In only too many instances, however, this iron oxide becomes disseminated along lines of bedding or in streaks and blotches, which injure the appearance, and do not materially, if at all, increase or better its weathering qualities. It is this fact that renders unsafe the quarrying of light-colored sand or limestones from below the water level, and placing them immediately in the walls of a building.

Iron in these same forms is also present in the limestones and dolomites, but is perhaps more abundant as a carbonate or a sulphide than in the fragmental rocks. If existing as a sesquioxide, it makes its presence known by the hue it imparts to the stone. If occurring as protoxide, carbonate or sulphide, its presence may not at first be suspected, but under favorable circumstances it is very certain to change to the condition of sesquioxide, the stone thereby changing from a gray or yellowish hue to red. This change may be witnessed daily in the process of brick-making, where blue-gray clay, containing iron carbonates or protoxide, is changed, by heating, to hard brick and of a red color. It is apparently this susceptibility to change, manifested by the iron compounds, that has given rise to statements to the effect that the color of a marble may often be intensified by heating. This is undoubtedly true, but it is safe to say that in proportion as the color is intensified, so is the quality of the stone deteriorated. The amount of heat necessary to convert within reasonable time the lower into the higher oxides, and thereby produce higher colors, would, in calcareous rocks, beyond doubt, injure the stone seriously, causing it to become weaker, more porous, and hence more susceptible to atmospheric agencies, even did it not convert a portion of the carbonate into the condition of quicklime.

That the blue-gray and black colors of limestones and marbles are due to carbonaceous matter is shown by their burning white when highly heated, as in the process of making quicklime. It is interesting to note, in this connection, that the almost chemically pure white crystalline limestones do not make the best quicklime. Quarriers long ago discovered this fact, and seek the softer blue-gray and dark-colored varieties. Very dark limestones carrying abundant carbonaceous matter sometimes bleach out on prolonged exposure. The green colors prevalent in certain of the Vermont marbles are due in large part to the presence of a green micaceous or talcose mineral.

LIGHTNING STRIKES THE EIFFEL TOWER.—The Eiffel tower was recently struck by lightning, and the scientific observers who were stationed for various purposes in the tower had, says a cotemporary, an excellent opportunity for studying that sort of phenomenon on the spot. The summit of the tower is protected by a lightning-rod, with a heavy point of bronze, tipped with platinum, and eight other points project obliquely from the level of the third platform. The upper point had shown signs of a dangerous vibration in high winds, and had been removed, leaving the end of the rod, with only the screw-threads cut on it, projecting above the top of the tower. About ten o'clock one evening, while the managers of the electric lighting were busy about the enormous groups of arc lights placed in the top of the tower, a terrific clap of thunder was heard, and the lightning was seen from the outside to strike the summit, while at the same instant, as well as repeatedly afterward, crackling sounds, accompanied with streams of light, were perceived around the undisturbed points at the gallery level. The people in the tower experienced no shock or inconvenience of any sort, but those standing outside on the galleries thought it prudent to get inside without delay. Immediately after the lightning a cloud descended around the upper portion of the tower, and, being strongly illuminated by the huge arc lamps, gave persons in the neighborhood the idea that the top of the structure was encompassed with electric flames, which, as was reported, "surpassed in brilliancy the lamps themselves." At the instant of the flash red sparks were seen to fly from the tip of the upper conductor, and, on examination, it was found that the screw-threads were in places partly obliterated, apparently by melting, and it was necessary to restore them with a file before the point could be screwed on again.

Refrigeration by Electricity.

It is well known, says the *Electrical World*, that the passage of a current across the junction of two dissimilar metals produces heating or cooling, according to the nature of these metals and the direction in which the current flows. This phenomenon, known as the Peltier effect, has been an interesting scientific fact for many years. While the heating of dissimilar junctions by the passage of the current has, it is true, been applied in one or two ways, the cooling effect seems to have attracted little or no attention from a practical standpoint. Our readers will, therefore, be interested in a patent which has just been issued to Mark W. Dewey of Syracuse, N. Y., in which the cooling effect produced by the electric current in the manner above stated is employed for freezing and refrigerating purposes.

Mr. Dewey, in his patent, describes a number of different methods of applying the principle, and shows a general method in which the cooling junctions are placed within a box and connected with a source of current. The heated junctions outside of the box are provided with large radiating plates which dissipate the heat generated there. Another application is also shown in which the heated parts are located in a pipe connected with a ventilator, by which the heat is carried off.

In addition to making use of the Peltier effect, Mr. Dewey shows a form of apparatus, in which the Thomson effect is made use of, in which differences of temperature in different parts of the same conductor are maintained by the passage of the current when the conductor is unequally heated. A continuous wire of iron or alloy is run alternately without and within the receptacle to be cooled. The exterior of warm coils is heated at the commencement of the operation by some external source, such as a gas-jet or an electrical heating device. Once the difference of temperature is established, it is maintained by the action of the apparatus on account of the different rates of cooling between the wire within and without the box, and this difference may also be maintained by making the external wire finer than that within the box, so that its temperature *is* always higher. Mr. Dewey also suggests that this class of apparatus may be used alternately as a refrigerator or heater by simply reversing the current.

A NEW OCEAN CURRENT has recently been discovered by Drs. Kukenthal and Walker in the Arctic region, in the vicinity of Spitzbergen. It is considered a very important discovery, and will be fully reported upon at an early day to the Bremen Geographical Society, at whose expense the exploring party under the direction of the above-named gentlemen, was sent out. In their brief communication announcing the discovery, they say: "One important result of our voyage seems to be our discovery of a strong ocean current which streams through the whole Olga strait from north to south, turning southeastward of King Charles land. It was very strong from the middle of July to the middle of August. On the surface it had a temperature of 1½° Celsius about the end of June, and 2·6·10° from July to the middle of August. But the temperature sank very rapidly in proportion to the depth. We observed this stream everywhere and at all times, from Northeast land to the Ryk Yse and King Charles. It was disturbed only near the flat coasts by the tidal currents." A second note is contained in a letter dated Tromso, Sept. 6, 1889, and runs thus: "This (the presence of driftwood on the shores) is in entire keeping with the existence of a strong ocean current coming from the north about the nature of which we shall fully report later."

EFFECT OF A LIGHTNING PHOTOGRAPH.—Miss Lilian Paul, whose face was said to have been photographed upon a brass plaque by a flash of lightning as she stood by an open window in Plainfield, New Jersey, two years ago, has recently become seriously ill. Her pulse at times is as high as 150 beats per minute. The physicians attribute her condition to the shock she then received.

THE PHONOGRAPH is made to record the inaudible sounds of vital movements in magnified lines on its tablets, by passing the sound waves through a sort of ear trumpet, so that the machine repeats them audibly; and thus movements that the physician never could detect before now report themselves and indicate conditions of the living organism hitherto inscrutable.

STAR CLUSTERS.—When Lord Rosse's powerful telescope was constructed, the far-distant objects, thought to be in formless nebulæ, or masses of gas, were said to be in reality clusters of stars. Norman Lockyer now holds that they are like comets, neither clusters of stars nor masses of gas, but that they consist of meteorites.

GOOD HEALTH.

Health of the State.

The October circular of the State Board of Health states that reports received from 101 localities, with an estimated population of 846,300, give the number of deaths as 1007, which is a percentage of 1.2 per 1000 in the month, or an annual mortality of 14.4, which is a slight increase over the preceding two months, but sufficiently low to indicate a very favorable condition of the public health.

The principal causes of death and the mortality ascribed to each were as follows: Alcoholism, 9; heart diseases, 70; erysipelas, 6; cancer, 48; cerebro-spinal fever, 7; remittent and intermittent fevers, 7; typhoid fever, 48; typho-malarial fevers, 4; whooping-cough, 4; scarlet fever, 4; croup, 10; diphtheria, 25; cholera infantum, 33; diarrhea and dysentery, 20; other diseases of stomach and bowels, 69; congestion of lungs, 9; acute bronchitis, 19; acute pneumonia, 54; consumption, 147; other causes, 414.

Contagiousness of Consumption.

Referring to the last-mentioned disease, the circular says: Our remark in the monthly circular of last month regarding the contagiousness of this disease and the undesirability of inviting its victims to this coast, seems to have given great umbrage to our southern neighbors, who seem to look upon the solicitude of the State Board of Health for the sanitary welfare of the State as a direct blow at their prosperity, and an endeavor to prevent the immigration of diseased persons into their midst. The State Board has no such desire or power; it can only advise the public of the danger incurred from the promiscuous mingling of consumptives with healthy people, which is its duty.

M. Delargy, in a paper contributed to the *Journal Hygiene*, points out that certain mountain regions in Europe, formerly exempt from phthisis, have now become infected since intercourse with cities and phthisical localities has been furnished, and considers the crowding together of a large number of phthisical cases, in the most healthy localities, will soon have an unfavorable effect upon the purity of the atmosphere. Indeed, it may be said that consumption is never contracted except by contact, by association, or by living in close proximity. The length of time consumed by phthisis before proving fatal, enables it to infect all susceptible persons coming in contact with it, hence its great danger when not isolated.

Cadeac and Malet, by experiment, proved that tubercular matter, dried and pulverized, was capable of transmitting the disease 100 days after such preparation, and Pietro asserts that tubercular matter will retain its virulence ten months after drying. Desiccation or drying of the sputa seems to be the most effective way of disseminating the disease. Cornet found that of 311 animals inoculated with the dust scraped from the rooms occupied by phthisical patients, 167 died soon after; of these, one-fifth were found to be tuberculous. He says further that a phthisical patient to be innocuous must never under any circumstances expectorate upon the floor or into a handkerchief, but always into a spittoon cup containing water, which must be disinfected and frequently changed. The danger of contagion from consumption is not exaggerated; preventive measures are as applicable to the South as they are to any other part of California, and the State Board of Health would be derelict in its duty if it did not point out this fact and call public attention to the necessity of caution in dealing with it.

A FORM OF ELECTRICAL SUNSTROKE.—In a recent number of the *Revue d'Hygiene*, M. Maklokoff of Moscow relates his experience of an "electric sunstroke" received at the Bernardos Electric Welding Works at Kolomno, near Moscow, where it seems there is great difficulty in getting the workmen to work more than two hours a day, on account of the injurious effect of the arc, although they are paid very highly. The current at the Kolomno works is obtained from 500 Plante accumulators, and an arc five centimeters long is produced. In order to obtain personal experience of the effects of an "electric sunstroke," and to be in better position to suggest a remedy, M. Maklokoff exposed himself for about ten minutes to the light of the naked arc at close quarters. The outcome of this *experimentum in corpore vili* was, as will be seen, somewhat unpleasant. Two hours later a tingling sensation, combined with burning of the eyes and skin, was experienced. This was followed by a cold in the head and watering of the eyes, tumefaction, discoloration of the skin, of the face, neck and hands, chemosis of the eyelids and photophobia. A feverish night followed, and next day there was an increasing œdema. On the third day there was a deepening in the brick-dust color of the skin, which commenced to crack and peel. This trouble and pains in the eyes disappeared, when a secretion in the conjunctiva began to show itself. Subsequently there was peeling off of the skin, as in erysipelas. M. Maklokoff attributes all these effects to the chemical action of the rays, and suggests that a glazed taffety veil, placed on a wicker headpiece, and provided with gray glass eyelet holes, should be worn by those employed in the Bernardos process and analogous operation.

ICED FISH DANGEROUS.—According to Mr. J. Lawrence-Hamilton, in the *Lancet*, ice spoils the freshness, firmness and flavor of fish by rendering it, prior to putrefaction, insipid, soft and flabby. Experience seems to show that the gravest cases of fish poisoning arise more commonly from eating fish which has been kept on ice than from eating fish kept naturally cool. Where fish is preserved on ice it appears that the ice only favors putrefaction by furnishing a constant supply of moisture, carrying with it the putrefactive bacteria derived from its foul and filthy surroundings, so that this iced fish remains covered with fresh solutions of filth pregnant with putrefactive bacteria. Thus large quantities of those subtile, complex bodies, the animal alkaloids, are probably elaborated, and give rise to those marked symptoms of poisoning which sometimes occur from eating fish preserved on ice. On the other hand, keeping fresh fish dry and cool can in no way favor putrefaction. And although here cases of poisoning may happen, yet the symptoms are much less marked, and pass off sooner, the toxic effects being usually confined to a passing attack of vomiting and diarrhea, while in the case of fish preserved on ice the vomiting and diarrhea may be less marked, though the other symptoms may be much more profound and lasting, and even sometimes fatal. There are various poisons derivable from putrid fish, the detailed consideration of which requires much further elaboration, work, experiment and research. Indeed, as upward of seventy different kinds of food fishes, within a few hours of their death, on being eaten, give rise to poisonous symptoms, the Russian Government, in 1894, will award a prize of $2500 for the best essay upon the nature and cure of fish poisoning.

A GOOD REMEDY SLANDERED.—"A hot lemonade taken at bedtime" is an excellent remedy for a cold, if it *be* taken at bedtime in the early stages of the disorder. This taking should be succeeded by a night's rest in a good warm bed; and a light, quick sponge-bath followed by brisk rubbing with a coarse towel as soon as you get out of that bed next morning. The latter treatment prevents the system from being left in such condition that another and much more severe cold is almost certain to be contracted, and is much more likely to result in restoration to a strong, healthy condition than dosing with any nostrum ever advertised.

SALUTARY INFLUENCE OF FLOWERS.—It is now established that flowers and the perfumes distilled from them have a salutary influence, and constitute a therapeutic agency of high value, and that residence in a perfumed atmosphere forms a protection from pulmonary affections and arrests phthisis. In the town of La Grasse, France, where the making of perfumes is largely carried on, phthisis is unknown.

USEFUL INFORMATION.

COLOR PRINTING ON METAL.—An ingenious and highly effective system of printing direct in colors on metal has been invented and developed into practical use by M. Cesar F. Joez, C. E., of Brussels. In this process, plates of zinc or other metal are specially prepared, and are nickeled or coppered, or both, as may be required. The nickel gives a silver and the copper a gold tint to the plate, to which is also imparted either a dull or a bright appearance, or both, as may be desired. The subject is printed in special enamel colors, which set at once, and embossing is effected by a special contrivance which forms a part of the process, and does not necessitate an engraved steel plate. The printing is performed from stones in the same way that lithographic printing is carried out. The results were shown at a demonstration which took place October 21st at 52 Queen Victoria street, London, when a number of specimens were exhibited. They all showed great delicacy of finish and brilliancy of effect. They comprised show tablets of various sizes and kinds, some being only in plain words, while others were embellished with architectural designs and landscape views. In all cases the subjects were well brought out, and where embossing was employed, the effect was greatly hightened. The further point is that the cost of production is said to be very moderate, so that this, combined with the effective appearance of the plates, will doubtless render the process in all respects a success. A factory has been started in Brussels, and is already turning out work on this system, and the plates exhibited were said to be not simply got up for the occasion, but samples of orders executed.

SILVERING MIRRORS.—A French manufacturer, M. Bory, has recently taken out a patent for silvering mirrors by a very simple and efficient process. The plate of glass, thoroughly cleaned, is laid on a table kept at a temperature of 25° to 30° C. To silver a plate one meter square, two liquids are prepared—the first, consisting of 10 grammes of double tartrate of soda and potash, dissolved in one liter of distilled water, and the other of five grammes of nitrate of silver dissolved in three grammes of pure ammonia, diluted with one liter of water. The two liquids are then intimately mixed, and a small portion of the mixture is spread evenly over the glass, when the remainder is poured on. In the course of 30 or 40 minutes the silver is precipitated in its metallic form, and adheres closely to the glass, which needs then only to be freed, by tilting from the superfluous liquid and slightly rinsed with water and placed upright to dry. A coating of varnish will then protect the mirror from the action of the air.

THE SEWING MACHINE.—In the series of reports on manufactures in Europe made by the men who accompanied the Workingmen's League to the old countries, there appeared an extended description of the sewing machine, in which the interesting fact is noted that the invention never became of practical value until the device of a continuous feed in combination with a horizontal table was added. This was the idea of John Bachelder, now residing at Napa, in this State, who patented his invention and sold it to a sewing-machine monopoly, which controlled it until the expiration of the patent in 1877. As soon as Mr. Bachelder's patent had run out there was an immediate and heavy reduction in the price of sewing machines, a direct testimony to the value of the invention. This explanation is due to Mr. Bachelder, who, like many inventors, got more glory than profit out of his idea, and because it is part of the history of a great invention.—*Ex.*

PHEASANTS FOR FOOD.—It is a curious fact that pheasants, which are now killed in Scotland by thousands, were first introduced into that country only about 90 years ago. The then Duke of Athole attempted to acclimatize them in his extensive woods around Dunkfield, but the Duke of Buccleuch was more successful in the border counties as he introduced them (after a successful trial in Dalkeith Park) at Bowhill, in Selkirkshire, and in Dumfrieshire, both at Langholm and Drumlanrig. The Fifeshire pheasants are now regarded as being the finest, just as Caithness yields the best grouse and East Lothian the best partridges. George IV sent pheasants out of fashion for a long time by repeatedly announcing that he did not care for them, but infinitely preferred a good fowl.

A NEW CEMENT, for securing iron into stone, is described in some of the foreign papers. The cement is made by melting resin and stirring in brick-dust, which must be finely ground and sifted, until a sort of putty is formed, which, however, runs easily while hot. In using, the iron is set into the hole in the stone prepared to receive it, and the melted putty poured in until the space is filled; then, if desired, bits of brick, previously warmed, may be pushed into the mass, and a little of the cement thereby saved. As soon as the whole is cool, the iron will be firmly held to the stone, and the cement is quite durable and uninjured by the weather, while, unlike lead and sulphur, it has no injurious effect on the iron.

INDIAN CURIOSITY.—The story is told how a party of Indians, fresh from the wilds, greeted their first view of a locomotive. They made no comment, and didn't even get up off the ground to examine it. But when a lineman walked up a telegraph pole like a woodpecker up a maple, they fell into paroxysms of enthusiasm. Simply, one thing was within the range of their astonishment, and the other wasn't. The writer was going up the Sacramento river, in 1851, in a stern-wheel steamer. On passing an Indian ranchero, not one of a large party of Indian women and children, who were sitting upon the sand near the edge of the stream, turned a head to look at the steamer.

DO FISH SUFFER PAIN?—There is a widespread notion that fish suffer very little pain in comparison with the higher vertebrates. But it is probable that fish suffer pain to a much greater degree than it suits the angler to believe. "A fly fisherman of 35 years' experience" says the sentiency in a fish depends very much on where he is hooked. If the hook is struck into a horny part, no pain seems to be felt; if it is fixed in the part of the mouth corresponding in man to that between the outer gum and the cheek, he is quite sure that the fish feels very acute pain, for, unless killed first, it quivers horribly when the hook is removed. —*The Naturalist.*

LIME WATER FOR REMOVING KEROSENE.—In cleaning lamps from which it is desired to remove all traces of petroleum, the lamp should be washed with lime water, made by dissolving slacked lime in water. The milky solution forms a sort of soapy emulsion with the petroleum, rendering its removal a simple matter. In order to remove the last odor of petroleum, a second rinsing in lime water to which has been added a little chloride of lime will prove absolutely certain in its effect.

STRENGTH OF THE PULLMAN CARS.—The great strength of some of the modern private, parlor and sleeping-cars was demonstrated in the recent accident on the New York Central, near Palatine Bridge. Here two private cars at the rear of the standing train received the full force of the shock from a train moving about 30 miles per hour, and instead of yielding and crushing, transmitted the shock to the next car, telescoping it for two-thirds of its length.

STEVENS' STATUE.—The pedestal upon which is to be placed the statue of E. J. Stevens, late master mechanic of the Sacramento railroad shops, is now being erected upon the plaza in that city. The statue itself is nearly completed —the finishing touches are being placed upon the work.

ELECTRICITY.

ELECTRICITY IN INDIA.—According to *Indian Engineering*, railway travel in India must be about the safest thing in the world, as the following official figures will show: "The mean mileage open, train mileage run, and number of passengers in millions was 14,379, 50,109,119, and 103,166 respectively during 1888, against 13,578, 15,779,096, and 95 75 respectively during 1887. The number of train accidents per 1000 train miles was 0.06. There were two passengers killed from causes beyond their own control; being an average of one per 51 58 millions of passengers traveling; 26 passengers were injured, or an average of one per four millions. From the total number killed and injured, viz., 28, it would appear that an average of 155.3 millions of miles was traveled for each casualty."

A NOVEL ELECTRIC ROAD.—A novel electric railroad is now in operation in England, which is very different from any road now running in this country. About a foot and a half from the car on the side of the track a flat rail runs, this rail being raised on posts of a foot in hight, the current traveling on this rail, ceasing abrupt on one side of the road and the car propelled by its momentum plying across the road where the rod catches on to the rail once more. The ends of the raised rails are connected by a wire passing under the road. The cars often travel at the rate of 20 miles per hour. The generator is operated by water-power.

NEW APPLIANCES FOR ELECTRICITY.—One Chicago gentleman is a persistent inventor of automatic coin-controlled devices, which include a slotted weighing machine, a testing machine, an opera-glass holder, etc., and is now bringing out a lung-tester; also a combined coin-controlled machine, operated by an electric current, that will permit of six operations on the payment of a nickel, or of any one on the payment of a penny. A new open circuit battery, a gas governor, and a track switch for electric railways, operated from a moving car, are also among his new devices.

ELECTRIC TRANSMISSION has been used in Germany for some years under restricted conditions. It has some advantages, as the conductor is less clumsy than shafting, steam-pipe, or rope, its position can easily be changed, and the motor is compact and less of a nuisance than a small steam engine. Loss of power there certainly is, but not much in the actual transmission between points far apart, if wire of reasonable diameter is used, and the less the power being taken off, the less is the percentage of loss in the transmitter, the opposite rule holding good with shafting.

PHONOGRAPHIC ANTICIPATIONS.—We have already given two or three instances wherein writers of a century or more ago seemed to have premonitions that something was to come in the near future in the character of the phonograph. Count Von Moltke was recently asked to talk into one of Edison's phonographs. The venerable soldier immediately applied his lips to the instrument and quoted from Goethe's "Faust" a sentence beginning with the following appropriate and remarkable words: "Ye instrument, mock me with wheel and combs, with cylinder and handle."

THE NEW LINES OF ELECTRIC RAILWAYS that are being projected in Boston at present are rapidly nearing completion. The digging of holes and laying of steel poles and new roadbeds is keeping a large number of men actively engaged. About 1000 poles have been set in South Boston. Gangs of men are at work on Warren avenue, and other gangs are at work on Shawmut avenue, along Tremont row, Hanover and Portland streets. The company expect to have about 100 more cars fitted up and running before snow falls.

THE WORK OF ELECTRICITY.—Prof. Elisha Gray remarks that electrical science has made a greater advance in the last twenty years than in all the 6000 historic years preceding. More is discovered in one day now than in a thousand years of the Middle Ages. We find all sorts of work for electricity to do. We make it carry our messages, drive our engine, ring our door-bell, and scare the burglar; we take it as a medicine, light our gas with it, see by it, hear from it, talk with it, and now we are beginning to teach it to write.

A NEW ELECTRICAL DEVICE has just been put on two of the electric cars of the Cambridge, Mass., line for experiment. It is called an electric-light coupler and is intended for use when a second car is attached to the power car. By snapping the coupler together at the ends of the connecting cars, electric light is provided for the rear car, thus doing away with the use of oil. This coupler practically solves the problem which the West End railway has been working over in the endeavor to provide some means for lighting attached cars with ease and safety.

ELECTRIC LIGHTING IN LONDON.—Upward of $15,000,000 are, it is said, already invested in electric-lighting companies in London.

BASE-BALLS.—One American manufacturer of base-balls employs 500 hands and keeps 40,000 dozen balls in stock.

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W. B. EWER.....SENIOR EDITOR

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[NEW THIS ISSUE.]
Assessment Notice—Booth Gold Mining Co.
☞ *See Advertising Columns.*

Passing Events.

The Silver Convention at St. Louis has commenced its labors, but doubtless a great deal of speech-making will be done before the members get down to real work. Whether the convention really represents the silver-mining interests it is hard to say; but the delegation from California has no mining men at all.

Thanksgiving Day occurring on Thursday of this week gives us all a holiday. The year past in California has been a prosperous one in all those branches in which the producing classes are employed, and the prospects are that the coming year will be even more fruitful of material advancement.

From what is said in other columns, it will be seen that the proposed changes in the mining laws will be injurious to the drift-mining interests of this State unless Senator Stewart, who has the bill in charge, will alter the provisions affecting that class of mines.

A SYNDICATE has been formed to build smelting and reduction works at Los Angeles. The first plant will cost $100,000. At present there are but two smelters in Southern California, one at National City and the other at Colton, but they are not of large capacity.

THE owners of the Good Hope mine, Hawthorne district, Nev., have shipped nine tons of $200 ore to the mill. One ton of sorted ore is valued at $600.

Our Lava-Capped Divides.

There are certain volcanic-capped "divides," or ranges, in this State under which are "dead" channels of ancient rivers filled with auriferous gravel, in some places being mined. The questions as to the mineral or agricultural character of such lands are bound to breed trouble and litigation before long. A short time since one of the drift-mining companies of this State was refused patent to a lava-capped divide because it had been listed to the railroad company as agricultural land; yet mining was being carried on under this ground.

The odd sections listed to the railroad company contain much of such land, and it is difficult for the miners to get good title. It is not that the railroad company charge extravagantly for the land, but that title under such circumstances is not very satisfactory. Some one may jump the land and say the railroad company had no right to it because it was mineral. At the same time, the purchaser has got to do annual work on it required by the mining laws and spend money on it as mining ground, while it was listed and transferred as agricultural.

These discrepancies will surely bring legal complications. If the ground is worked systematically, the miner ought to spend $5000 or $6000 in one place, instead of digging a lot of little holes on small tracts. But no one wants to do this on ground that may belong to the railroad and may belong to the Government. The title would be too indefinite. There is no mineral on the surface, but down under the lava there is auriferous gravel which yields largely when worked in a systematic manner. The Government officials should at once take cognizance of these facts.

Saving Gold.

One of the problems of the future in all gold-mining regions is not only how to discover gold in paying amounts, but also, when found, how most effectively to save it. Much has been done toward the perfecting of gold-saving appliances, yet very much remains to be done before it can be said that this branch of the science of mining has been placed in a satisfactory condition. To do this will give an almost unlimited scope for scientific and practical investigation and experiment. This would involve a large outlay of time and money; but such outlay will prove a remunerative investment.

The mining community is dependent upon itself for any improvement in the processes of extraction. The result of work at the different mills and reduction works is all we have to go upon. What improvements are made, gradually, but slowly, find their way into practice. There is no standard work on processes of gold extraction which embraces all the experience of gold miners, though there is great need of one. Much can be done by our State Mining Bureau in bringing available data together, in which a beginning was made last year; and it is to be hoped that this season much more information on the same subject will be gathered.

Mineral Lands and Railroads.

The Mineral Land Convention has been summoned to reconvene at Helena, Montana, on Nov. 29th, as prompt work is necessary to frustrate the attempt of the Northern Pacific R. R. to take up mineral lands. The president of the convention in his call says: "The question of the mineral lands of Montana and the relations of the Northern Pacific Railroad Company thereto, having again been brought prominently to the attention of the people by the action of the railroad company in adversing certain mineral applications for patent, and by rulings of the Land Department, which appear to be adverse to the mineral claimants; together with the near probability of patents being issued to the railroad regardless of the rights of mine-owners, seem to render it necessary that the Mineral Land Convention again be called together for the purpose of devising new ways and means for meeting the serious crisis which now threatens."

This subject is a very important one for Montana, as well as other mining States and Territories. Unless prompt action is taken, vast tracts of mineral land will fall into the hands of the railroad companies.

THE Santa Barbara *Herald* says the gold beach mining at Lompoc is petering out.

A Tuyere Slagging-Valve.

(*Concluded from page 409.*)

istence the tuyere slagging-valve now in use at the Warwick furnace, and found to be valuable. The form was suggested by the chief engineer, who thought that a valve placed in the cap or the bottom of the belly-pipe, connected with the piston of a cylinder of a larger diameter than the valve and operated with a three-way cock placed in a pipe connecting the cylinder with the main blast-pipe, would afford a sure way of flushing through any belly-pipe without stopping the engine at all.

The accompanying drawings explain the construction. Figs. 1, 2, 3 and 4 represent the ordinary three-inch valve. In these figures, *C* is the leg-pipe; *D*, the elbow; *E*, the belly-pipe; *F*, the circular casting, keyed to the elbow by keys *T*. This casting carries the valve-seat, held in position by key *Q*, and is of the same diameter, external and internal, as the elbow *D*. *G* is the swinging-cap of the elbow, held in position by keys *S*. *H* is the valve-cylinder, with *K* opening for connecting-pipe running to the circular blast-pipe and a small opening *L*, at bottom, for the escape to the atmosphere of any air leaking past the piston. *M* is the usual eye-hole, arranged with a stop-cock to permit the easy cleaning of the glass. *N* is the guide for the rack-extension *O* of the piston-rod; *U*, the sector with extended arm, carrying the valve *V*, and fitted to work easily with rack *O*. In practice, it was found that when the valve *V* was thrown open by pressure of air in the belly-pipe (the pressure in valve-cylinder being cut off), owing to its own weight and that of piston and piston-rod, *V* would partially close again, not enough to interfere with the flow of slag through the opening, but just enough for the slag to strike it and in time cut it.

In order to hold the open valve in the position shown in Fig. 4, a ¾-inch pipe-connection, *S*, was made from the top of the circular casting, *F*, to the lower part of the valve-cylinder, *H*. The opening in the cylinder is immediately opposite the piston when the valve is closed. When the valve, *V*, is opened and the piston of the cylinder raises, air passes through the pipe, *J*, to the lower side of the piston and connects to them the valve, *V*, wide-open, and holds it in the position shown. In the pipe, *J*, is placed a stopcock, *R*, to regulate the amount of air to be admitted to the lower side of the piston. A brass plug, *X*, is screwed into the top of the tee to facilitate cleaning the pipe in case it should become filled with plumbago or gas dust.

The tuyere slagging-valve is easily applied to any of the usual forms of belly-pipes. To keep the valve closed, the furnace being in operation, the plug of the 1½-inch three-way cock is so turned that the opening to the atmosphere is closed and the passage from the main blast-pipe to branches and cylinders is opened. The ¾-inch cocks are turned the same way. The pressure of blast in the belly-pipe is the same as in the valve cylinder. The area of the piston being larger than the area of the valve in the belly-pipe, the latter is kept tightly closed, never leaking. If it is desired to open a valve, the plug of a ¾-inch three-way cock is turned, cutting off the supply of air from the blast-pipe and opening its passage to the atmosphere. The pressure of blast in the belly-pipe acting on the valve, forces it open, driving up the piston of the valve-chamber, upon which there is now no pressure. The air filling the cylinders, escapes to the atmosphere through the side opening of the cock.

Slag driven into the belly-pipes can be quickly discharged through one or more of the slagging-valves without loss of time. When the crucible is badly chilled, the iron and cinder notches are closed, and the slag melted by each tuyere is prevented from distributing itself over the area of the crucible and confined to the immediate vicinity of the tuyere melting it, this slag can be discharged through the tuyere slagging-valves with no risk to the men and without stopping the engine for a moment, thus avoiding all loss of time and all the dangers attending the further cooling off of crucible and blast. The management of a furnace is thus, to some extent, simplified, and one of the most serious annoyances attending the operation of an anthracite furnace is removed, viz.: the difficulty of keeping the tuyeres open. We shall, in the next number of the PRESS, describe the operation of larger valves of the same type.

The Drift-Mining Interests.

The fact that mining auriferous gravel by the hydraulic method has practically ceased in this State, owing to legal complications, has evidently created an impression that gravel mining generally has stopped. This is by no means the case, for the ancient river channels of California have scarcely been touched, and drift mining is a growing and successful industry. Some of the old hydraulic mines are being worked by "drifting," and more of them will be in course of time.

The Stewart mining bill, which will be considered by Congress shortly, not only ignores the drift-mining industry of California, but does it a positive injury by certain of its provisions. In another column is given a statement signed by prominent men interested in this branch of mining, in which the dangers that threaten drift mining are pointed out. Their views are indorsed by others who have seen the letter referred to after it was put in type.

The Forest Hill Divide, to which these gentlemen directly refer, has yielded something more than $20,000,000 in gold, and this from the more accessible points only; the greater part is still undeveloped.

There are a great number of similar volcanic-capped ridges, marking the courses of ancient gold-bearing channels in Placer, Nevada, Sierra, Plumas, Butte and other counties in this State. A few of these only have been developed, and it is apparent that the drift-mining industry is not only an important one at present, but is destined to become still more so as new regions are opened by capital.

If the Stewart bill, as it now reads, should become a law, prospecting for new drift mines would virtually cease, and most of those now unpatented would have to be abandoned.

To avoid misunderstanding, we think the bill should define the maximum limit in the number of acres, or the number of 20-acre locations which may be included in a single "claim." As the bill now reads, many miners will be at a loss to know whether a "claim" under the proposed law will be limited to 20 acres, 80 acres or 160 acres.

There is also an apparent oversight in the bill which permits the assessment work for five adjoining claims to be done at one point and then limits a single application for patent to 80 acres.

If it is shown that a drift-mining property on one of these volcanic-capped channels must contain 500 to 1000 acres in order to justify development—and experience shows this—it is plain that provision should be made for the working of that number of acres as one property; *i. e.*, for doing the assessment work at one point (and the amount should not be unreasonable), and for obtaining patent under one application.

If the 80-acre limitation makes it necessary to do $500 worth of labor on each 80-acre tract before applying for a patent, the drift miner will either have to go ahead without a patent or waste thousands of dollars in useless work.

These facts should be carefully considered by the Committee on Mines of the U. S. Senate, to prevent confusion in the future and to afford relief for the drift miners. As at present drawn, the bill relates mainly to quartz mines, the drift mines having been apparently overlooked. If the bill passes without being remodeled, it will, without doubt, work dire disaster to the important industry of drift-gravel mining in this and adjoining States.

Mr. Hammond's Views.

EDITORS PRESS:—Respecting the communication sent to you from Forest Hill regarding the Stewart bill in its relation to drift mining, I most strongly indorse the views therein expressed. Yours truly,

JOHN HAYS HAMMOND.

NEWTON LLOYD, a prominent mining man, heavily interested in mines in Mexico, and well known throughout the Pacific Coast, died at Coneto, in the State of Durango, last week.

ISHPEMING, Michigan, boasts of a gold mine with quartz worth $50,000 a ton. If they find a couple of tons of this kind of rock they will be in luck.

A RICH gold strike has been made in Montgomery county, North Carolina.

The Stewart Bill and Drift Mines.

California Mining Interests Threatened.

EDITORS PRESS:—We, the undersigned, being interested in the development of drift gravel mining properties, desire to call attention, through your columns, to the injurious character of certain clauses in the Stewart mining bill now pending before Congress.

These clauses concern the required annual expenditure on placer claims, and the number of acres which may be included in a single application for patent.

The bill calls for the annual expenditure of $25 "for each 20 acres of placer claims."

We assume that a "placer claim" may still contain as much as 160 acres, as formerly.

The annual assessment work upon one placer claim of 160 acres would then amount to $200, or double the amount now required.

A further provision permits the owner of several adjoining claims, not exceeding five, to hold the same by expending $5000 in labor upon one of the claims.

The owner of five adjoining claims, say of 800 acres, might then hold his property—either by expending $200 in labor upon each of the five claims, amounting to twice the present requirement, or by expending $5000 upon one of the claims, amounting to ten times the present requirement.

No distinction is made between shallow superficially exposed placer deposits and the covered deposits of the ancient channel systems.

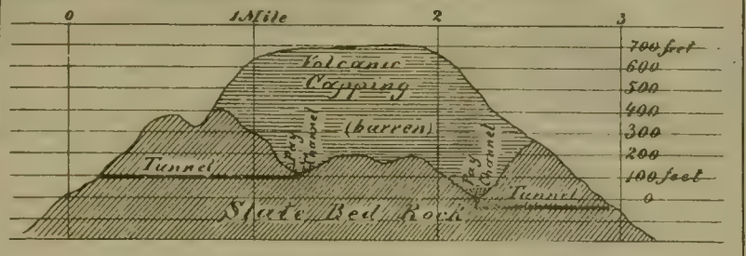
It is possible for the prospector to make a location upon the exposed deposit with a certain degree of intelligence, even if confined to a small claim. He may test the quality of the gravel by means of shallow pits or open cuts.

But the location of the covered deposit is a very different matter. As a rule, the latter contains only a narrow winding course of pay gravel, which may be worked only by underground drifting, and cannot be exposed for prospecting without the outlay of a large amount of capital. The position and course of the pay channel is a matter of vague conjecture within limits too broad to be covered with certainty by a 160-acre claim.

As an example of the drift-mining gravel deposits, we herewith furnish a cross-section characteristic of the Forest Hill divide.

The narrow channels are filled with pay gravel to the depth of a few feet only, and are, as a rule, covered by a large deposit of barren volcanic material from one to three miles in width, and from 500 to 1000 feet in depth.

The surface of this extensive volcanic capping



CROSS-SECTION OF FOREST HILL DIVIDE.

offers no definite clue for the location of the hidden channel. The locator may satisfy himself that a pay channel exists somewhere under the volcanic capping, but he cannot determine the position within one-fourth of a mile or frequently within one-half of a mile or more.

Even if the precise location were known, the channel could not be worked profitably through shafts sunk from the surface, owing to the large flow of water in the channel course and to the comparatively small pay of the gravel per ton.

These channels can only be worked profitably through long bedrock tunnels placed low enough to drain the ground.

Such tunnels have to be driven through hard rock, seldom less than 2000 feet, and often as much as 5000 feet, before tapping the pay channel, and involve an expense of from $25,000 to $100,000.

To justify such an expense, it is necessary that the individual or company running such tunnel should own at least one or two miles length of pay tunnel. Owing to the uncertainty of the position or course of the channel, this usually involves the holding of from 500 to 1000 acres of ground, or more.

Assessment work done upon the surface of such properties is, as a rule, absolutely valueless. The above cross-section shows how fruitless would be the sinking of a shallow pit upon each 160 acre lot of the barren volcanic capping.

The provisions of the Stewart bill would cause the useless waste of a large amount of labor on the Forest Hill Divide and numerous similar divides in this State.

If the annual work is to be made a matter of valuable development, the provisions of the bill leave no choice to the owner of one of these properties—his assessment work will amount to ten times that at present required.

It is not our purpose to object to the rate of $25 for each 20 acres—*i. e.*, the doubling of the present rate—but we consider such increase sufficient, and think that provision should be made for doing all of the work at such rate at any point within the boundaries of the property.

A further provision of the bill limits the extent of ground which may be included in a single application for patent to 80 acres. We do not understand the purpose of this limitation, especially in its application to drift-mining properties, such as above described.

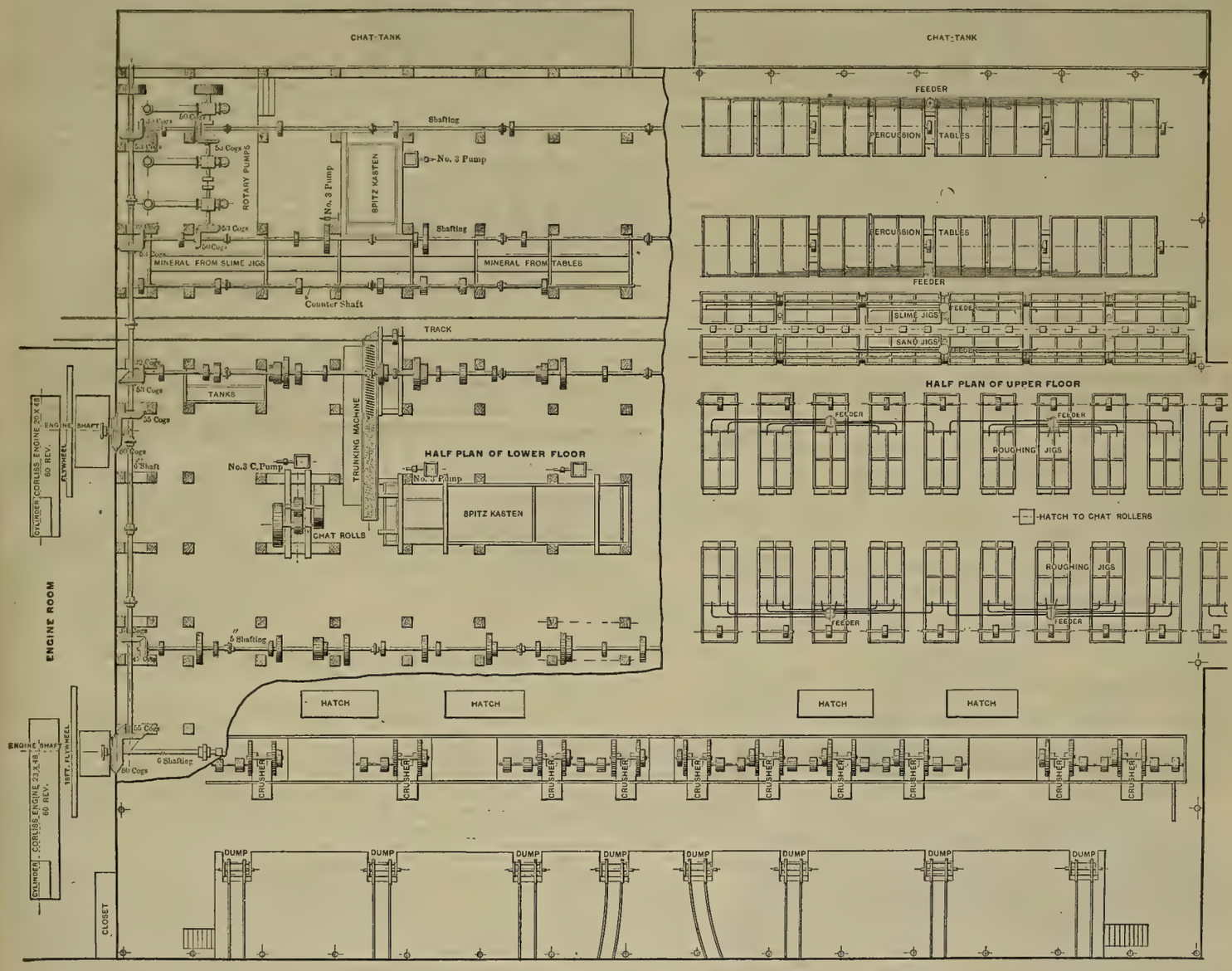
As already stated, the character and position of the gravel deposit to be worked by drifting, makes it necessary to include 500 or 1000 acres in one property. We do not see why the owner should be subjected to the useless expense of making a separate application for each 80 acres. Such a requirement would entail subdivisional surveys and a large amount of purposeless clerical work, and would greatly encumber the records.

CHAS. F. HOFFMANN,
Sup't of the Golden River mine.
ROSS E. BROWNE,
Mining Engineer.
J. B. HOBSON,
Owner of drift mines on Iowa Hill and Forest Hill divides.
ANTHONY CLARK,
Owner Big Channel claim.
F. CHAPPELLET,
Sup't Mayflower G. M. Co.

Forest Hill, Placer Co., Nov. 23, 1889.

The St. Joseph Ore-Dressing Works.

In the PRESS of last week was given a sectional view of the new ore-dressing works of the St. Joseph Lead Co., and herewith is presented a general plan of the mill, showing the arrangement. The construction of the building was described last week. The method of treatment may be outlined as follows: The ore is crushed by jaw-crushers and rolls, and screened dry through a 6 mm. screen. The sands passing through the screen are thoroughly mixed with water and elevated by centrifugal pumps to distributors and divided among the Parsons jigs, without any previous sizing or classification. The tails ("chats") after passing over the two sieves of these jigs receive no further treat-



GENERAL PLAN OF THE MILL OF THE ST. JOSEPH ORE-DRESSING WORKS.

ment, and are conveyed by launders to the "chat-tanks." Coarse galena and raggings are skimmed by hand from the jigs at intervals, leaving always a sufficient bed to insure good hutchwork. The hutchwork which comes through the sieves of the Parsons jigs pass through a series of spitzkasten. The heavy galena, mixed with some sand and slime, settles in the first box of the series from which it is fed to a trunking-machine. The pure galena from this machine falls into railroad cars and goes to the smelting-works. The tails from the trunking-machine, together with the sands settling in the second box of the spitzkasten, are elevated by centrifugal pumps and divided between the Hartz three-sieved jig. The tails of the Hartz jigs receive no further treatment, going directly to the chat-tanks. Galena and

pyrites are skimmed from the sieves of these jigs. A bed of galena is, however, maintained on all three sieves so as to insure a rich hutch-work. The hutchwork of these finishing-jigs is nearly pure galena, and goes to galena-boxes on the lower floor, which are emptied from time to time, and the galena loaded on cars to go to the smelting-works.

The fine slimes settling in the third and fourth boxes of the spitzkasten are united and raised by centrifugal pumps to the distributors feeding the first row of Parsons Rittinger tables. The middlings from these tables are treated on the second row of tables. The tails from all the tables flow into the chat-tanks, and the heads run into galena-boxes on the lower floor from which they are loaded into cars.

The raggings, containing from 12 to 20 per cent of lead, which are skimmed from the Parsons jigs, are recrushed by fine rolls and elevated without screening to a line of Hartz three-sieved jigs. These raggings contain considerable pyrites.

The main disadvantage attending the arrangement of the mill in two floors, as described, is the necessity for elevating the material to be treated several times. This is accomplished at Bonne Terre by the use of centrifugal pumps by which the sands are elevated *with the feed-water* required for the proper working of the various jigs and tables. It should not be overlooked, however, that the bulk of the material is elevated but once. After passing over the roughing-jigs, 600 tons of waste sand go at once to the chat-tanks. Of the remaining 200 tons, 74 tons are mineral and raggings, and 20 tons escape with the overflow of the spitzkasten, leaving only 106 tons to be elevated again. The average lift of the 800 tons raised by the centrifugal pumps, including that which has to be elevated a second time, is less than thirty feet. If a mill of several stories like an anthracite breaker, or one arranged in steps or terraces like the Lake Superior mills, had been built at Bonne Terre, it would have been necessary to deliver the ore at a level at least forty feet higher than at present, involving a much more expensive building, and increased cost of hoisting, forty feet instead of thirty, for the whole 800 tons, merely to save the elevating of 100 tons a second time.

Again, if the mill had been built in several stories, both the wash-water and feed-water for the different machines would have to be raised about 20 feet higher than at present, and as 29 tons of water are required to treat one ton of ore, this additional lift would be a serious matter.

In round numbers the saving by the present arrangement amounts to about 520,000 foot-pounds per day, or over 20-horse power.

Rocky Mountain Ore-Producers.

The Rocky Mountain Ore-Producers met at Salt Lake City last week. Utah, Nevada, Idaho, Wyoming, Montana and Western Colorado were represented. Strong resolutions were adopted in opposition to Secretary Windom's ruling on Mexican ores, based on a long report reciting the action of the Treasury Department, in inviting a hearing on the question, the long delay in making the ruling and the final holding against home ore-producers in opposition to the law and contrary to the traditions of the department.

The convention finished its labors by the adoption of an address demanding the free coinage of silver, the repeal of the Bland law, and the issue of silver certificates on deposits of silver bullion. A resolution was also adopted calling for the union of the mining States and Territories in a protective union for mutual benefit.

The following delegates were chosen to attend the St. Louis convention: R. C. Chamber, N. Treweek, J. J. Daly, R. Mackintosh, A. G. Morrell, L. E. Holden, R. C. Goodwin, A. Hanauer, D. C. McLaughlin, W. S. McCormick, T. R. Jones, O. J. Salisbury, J. R. Walker, C. W. Bennett, R. McBride, W. S. Smith, W. F. James, O. K. Hollister, H. W. Lawrence and F. W. Billings.

THE ELECTRIC MOTOR.—The Virginia *Chronicle* says: The surface electric-motor plant at the Nevada mill was inspected yesterday by Messrs. W. S. Hobart and Alvinza Hayward. The motors have been in constant operation for about three weeks, and if run continually for 30 days the contract with the Brush Co. will be fulfilled, and the plant accepted by the Chollar Co., if it is in first-class order at the expiration of the 30 days. Mr. Conner, the electrician in charge, is confident that he can run the mill for months without stopping for repairs to the electric plant. Messrs. Hayward and Hobart are reported to be satisfied with its work.

THE GOLD HILL MINES.—It has been decided to drain the Gold Hill mines down to the 2700-foot level, at which depth high-grade ore is alleged to have been developed at the time of the abandonment of the workings of Comstock lode below the Sutro tunnel level. There are also said to be extensive low-grade ore reserves on the 1700-foot level of the Crown Point and Belcher now flooded. The drainage is to be accomplished by donkey pumps in the Belcher and Crown Point, and by a powerful Cornish pump at the Alta shaft.

IT is hoped to complete the Owens River canal in Inyo county within the next 90 days. The entire length is over 38 miles, and it will reclaim 30,000 acres.

Inyo Marble.

It has been truthfully said, "There is only one California." There is no other part of the known world that has within her own borders such endless variety and boundless resources in soil, mine and climate in mountain and valley. Within her limits are all that the highest civilization demands or humanity craves. Within herself are all the elements of Empire, dependent on no other land for anything needed for luxury or comfort. Variety of climate to suit the most exacting within one day's ride. Wines and fruit that would almost put to blush the ancient land "of milk and honey."

Among the sources of her boundless wealth is last, though not least, her inexhaustible marble deposits. Italy has for over 2000 years been the studio of the world in fine arts. Hundreds of her people have become rich, and her name has become a household word the world over through her immense marble deposits. With all her world-wide reputation, she is now called to meet a competitor worthy of her steel.

California comes forward and claims her long and worthily worn laurels, by presenting a marble that will stand the most severe tests and compare with any marble known, for equality of texture, strength, crystallization, hardness and durability. The most noted is the Inyo marble in the Inyo range of mountains. It is a mountain of marble, with no soil to protect it from storm or sunshine of winter and summer for the centuries past, but there is not the least sign of decay. It contains white, black, blue, blue and white, mottled blue, striped white and purple, veined purple and yellow, yellow, moss agate, etc. The large mass is white; the other forms in different strata.

The top strata, or as it is termed by the quarryman, the slide, is considerably broken, probably caused by being undermined by the lake or river, which has undoubtedly some time in the past ages washed the base of the mountain. In proof of this, in sinking near the present foot of the mountain for water, six feet from the surface and for 25 feet down, volcanic ash or pumicestone was found, in which were imbedded mussels or fresh-water clams of the size now found in our markets. After penetrating this slide, a bed of marble is uncovered that appears never to have been moved from its original bed or formation.

This marble is a dolomite or magnesian limestone, composed of carbonate of lime and carbonate of magnesia in nearly equal parts. It has a clean, clear crystallization which is not excelled, if equaled, by any marble known on the market.

On this coast, where everything is hurry, hurry, and where the amount of labor required to put the material in shape for use is more of a consideration than durability, where the largest display for the least money governs in the selection of material to be used, the Inyo marble is met by the objection: "It is too hard." In our older cities, as New York, Boston, Philadelphia, where they are building not for the present but the future, its hardness is its great recommendation. One thing, however, is that it can be wrought and finished finer for less money than granite.

It is susceptible of highest polish and is capable of the finest carving. There is no kind of ornamentation for cemetery or building that cannot be executed in this marble; nor is there, it is claimed, any stone that will retain its polish longer than this, not even excepting Scotch granite.

With these points of superiority, it does not require a very far-seeing eye to see in it the large field for the use of capital and the accumulation of wealth.

The company have recently purchased a water power near Verdi, on the Truckee river, put in a dam and have now running through their raceway a body of water four feet deep and ten feet wide, with a fall of 25 feet at the location for the mill. This power they propose to utilize by erecting a mill for sawing, turning, polishing and finishing marble for all purposes for which marble is used, such as monumental and cemetery work, building, hearths, tile, steps, slabs, etc. With this power they will be able to furnish marble as cheaply as it is now possible to do in Italy, and will thus save to ourselves the thousands now sent out annually to other lands for this material.

MINERAL LAND CONVENTION.—Lee Mantle, president of the Mineral Land Convention, and all concerned will meet at Helena on the 29th inst. The call reads: "The question of the mineral lands of Montana and the relations of the Northern Pacific Railroad Company thereto having again been brought prominently to the attention of the people by the action of the railroad company in advertising certain mineral applications for patent, and by certain rulings of the Land Department which appear to be adverse to the mineral claimants, together with the improbability of patents being issued to the railroad regardless of the rights of mine-owners, seem to render it necessary that the Mineral Land Convention again be called together for the purpose of devising new ways and means for meeting the serious crisis which now threatens over two million acres of the richest mineral land, including the famous Oro Fino district in Montana, involved in the contemplated steal of the railroad company."

WOOL MANUFACTURES.

Comparison Between American and English Woolen Goods.

The preference of the American public for fine woolen fabrics of foreign manufacture, according to good authority, is not altogether based upon fancy or some whimsical notion; but it has a substantial basis in the actual superiority of the goods, not, perhaps, in their durability, but rather in their greater excellence of fabrication, especially in that portion of their manufacture pertaining to their finishing.

Mr. A. B. Capron, good authority upon this subject, says: It is a common, almost a standard, boast with us that we are not excelled in our woolen goods. This is a mistake unworthy the intelligence of our manufacturers. We do many things well, and even in a superior manner, but to take our stand upon a mere boast is not to our credit. The English manufacturer excels us greatly in the process of finishing, as is shown in the appearance of his finished goods. However humiliating to our pride, this fact must be conceded, and better candidly than to affect an assertive boastfulness.

We are in a position to remedy the defect. Aside from the general appearance of the face of English woolen goods, the "feel" and "handle" of their fabrics in this staple is far superior to those of our home manufacture. There is less of "sponginess" where a soft "feel" is required, and less of "harshness," or the "wiry feel" in goods, the requisites of which are firmness in heavy weight.

We in the United States have English designers and managers, some of them well and even thoroughly educated, graduates of their home textile schools; and it is to be presumed they are granted every facility—have their own way in every manipulation of the fiber from the bottom to the top of the mill, even to the selection of the wool, and yet they fail to produce the finished effects noticeable in their home goods and which strongly mark the difference between the fabrics of the two countries.

As colors enter largely into the face appearance of fabrics and have much to do with the general finished effect, the American is not so far behind. There are those who believe that the equal of English colors cannot be found in America. This is a mistake of the Englishman which may be offset against the American boast of equality in finishing. As applied to woolens, American colors are not excelled.

That which most detracts from American coloring in textiles is the use or blending of them. If a primary is not followed or contrasted with a legitimate secondary, the one will deaden the effect of the other. So of the tertiaries and their subordinate divisions on blends. It is a well-known fact among the craft that inharmonious blendings will neutralize the most brilliant colors, which inexpert critics charge to the cant phrase, "You can't equal the English colors." These are only a few of the elements which enter into the appearance of the finished fabric, but they are of supreme importance.

While in the one factor we may safely lay claim to equality, in the other we must acknowledge our deficiency and make our best efforts to discover a remedy.

Why and How Wool Varies.

It is frequently remarked, says an exchange, that all kinds and characteristics of wool can be grown in this country; that the fleeces of Australia, Buenos Ayres, Cape Colony and elsewhere can be produced here with all the peculiarities that distinguish them equally as well as in the countries of their origin. The disposition is to give no credit to the climate and vegetation of those countries that is not equally applicable to this. True, there are sections in the United States where fineness of fiber can be grown, but it has not yet been demonstrated that it can be done and still possess the suppleness and softness that characterize the fine wools of Australia. There may be exceptional instances where this has been done, but nothing has seemed to favor it on a large scale. The fine-fleeced sheep is not hardy enough to stand the winters of our northern Territories, and the soil and vegetation of the more southern sections, west of the Mississippi, are wholly unfavorable, while east of the Mississippi land is too valuable for sheep ranges.

Prof. W. H. Brewer, in writing on this subject, says: There is a great deal of difference in the climate for producing wool, whatever is said to the contrary. This is demonstrated beyond the shadow of a doubt. Some of the New England mills pay a slightly higher price for wools that come from the region that embraces Southern Ohio, Western Pennsylvania and a portion of Western Virginia, than any part of the United States. There is a texture to it, a slightly different feel which manufacturers understand. There is a change in the wool if sheep are transported from those regions to other portions of the United States which are a little drier, whether it be directly due to the influence of the climate or indirectly due to the breed. One of the manufacturers of New England said he had been in the habit of buying wool of a certain farmer in Southern Ohio. As the farmer's family grew up and swarmed, one of the sons went into Kansas and carried with him a portion of the flock of the old farm. The manufacturer bought wool of both father and son, and gave me a sample not merely from the same flock, but from the same individual sheep, taken two or three years apart, one when the sheep was an inhabitant of Ohio and one when it was an inhabitant of a pretty dry portion of Kansas. They were colored in the same dye, the same mordant was used, the same vat, and yet there was a big difference in the wools.

A gentleman of large experience in Virginia told me precisely the same kind of history. He himself had attempted the growing of sheep with the purpose of getting wool just as good in one region as in another and failed. There is a considerable difference in the quality of wool as produced in different climates that is due to the climate itself, directly or indirectly, and the food that is produced in that climate. It may be brasher, there may be a certain harshness about it, and it may not manufacture quite so well. Now, while sheep are long continued to be bred in the poorer of these climates, they deteriorate, unless the blood is kept good by an infusion from the better regions. And that is what will give some regions perpetually an advantage in certain kinds of stock-growing over others; it will always be to their profit to produce animals to go somewhere else, just exactly the same as farmers living in one region may grow grain to be used in another.

First Sheep in the United States.

Draper's *Record* gives the following interesting facts in regard to the first introduction of sheep into the United States, and the establishment of the first woolen-mill: The first sheep introduced into the United States were taken to Jamestown, Virginia, in 1609. Great efforts were made to encourage the woolen industry, and some years later a law was passed which compelled every family to spin three pounds of wool, cotton or flax per week during 30 weeks of the year. About the same time the first weaver settled in the country and received a grant of 30 acres of valuable land. In 1662 Virginia prohibited the exportation of wool and offered five pounds of tobacco as a premium for every yard of woolen tissue produced in the colony. The breed of the sheep at the time in America was, however, inferior, and it was not until the commencement of the present century that the Spanish Government consented to sell a flock of fine merino sheep at an exorbitant price for exportation to America. It is stated that even in 1810 there were only about 5000 sheep of good breed in the country, but from them sprang the large flocks which are now found in the United States.

The first cloth-mill worthy of the name was erected in 1788 by several of the inhabitants of Hartford, Conn., and its annual production amounted to 5000 yards. It is stated that the proprietors of this establishment presented Washington with a suit made of their cloth in 1791. Other works soon arose, and in 1810 there were five mills producing fine woolen tissues, and 19 which manufactured coarser descriptions, their aggregate production being 200,000 yards, and a considerable quantity was also produced on hand looms.

The war in 1812 gave a great impulse to the American woolen trade, but when peace was concluded British tissues were imported in enormous quantities and completely crushed the industries of the States. Congress then found it necessary to protect the American manufacturers, and imposed in 1816 an import duty of 25 per cent ad valorem on woolen tissues, and in 1824 it applied a duty of 15 per cent on raw wool costing less than 10 cents per pound, and of 20 per cent on wool costing more than 30 cents per pound.

WHAT CAN BE DONE WITH A POUND OF WOOL OR COTTON.—*Harper's Bazar* says: It has been fairly tested that a pound of wool can furnish in fine yarn 84,000 yards, lacking but 80 yards to complete forty-eight miles. This, at the time—more than 100 years ago—was regarded as a triumph of skill, and it was said by a score of mistresses in the art of spinning that the worthy dame of East Dercham, in Norfolk, could not be beat. This was considered so great a curiosity that the Royal Society of England did not hesitate to make honorable record of it. Since then, however, another lady "has spun a pound of combed wool into a thread of 168,000 yards; and more than this was her success in producing a thread 203,000 yards long from the same weight of cotton. Her ball unrolled would measure 115 miles. If this ball of cotton thread had been woven it would have made 20 yards of muslin one yard in width."

SHEEP HUSBANDRY IN IRELAND is growing in popular estimation, if the increase in the number of sheep for 1889 over that for 1888 of nearly 4½ per cent is any criterion. The number of sheep in Ireland is now estimated at 3,789,629, of which 40 per cent are under one year old. The relative standing of the provinces, according to the number of sheep, is as follows: Leinster, Connaught, Munster and Ulster. The county having the largest number of sheep is Galway, next to which stands the county of Cork.

NEVADA WOOL.—The *Nevada State Journal* is authority for the statement that manufacturers using Nevada wools complain of the tar which they find on the ends of the staple. It gives them a great deal of trouble, and is more difficult to handle than burrs. Unless the

practice of tarring fleece is discontinued, Nevada will lose its high reputation among manufacturers. If the wools of Nevada once get the reputation of being troublesome on account of tar on the ends of the staple, it will take a long time to overcome it, and manufacturers will pass the wool by.

WOOL-MANUFACTURING FAILURES.—The record stands 16 failures of woolen-manufacturing concerns in 1889 prior to Aug. 29th, as compared with 35 in a like portion of 1888. But comparison of aggregate liabilities shows an increase of far more than 32 per cent, the proportion of increase in number. The liabilities of failing woolen-manufacturing institutions this year amount to $6,920,000, as compared with $2,180,000 last year, and the total assets to $5,173,000, against $1,355,000 in eight months of 1888.

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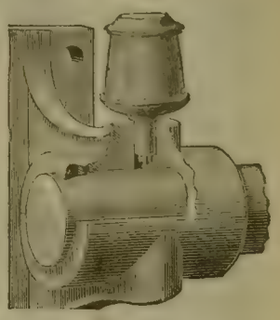


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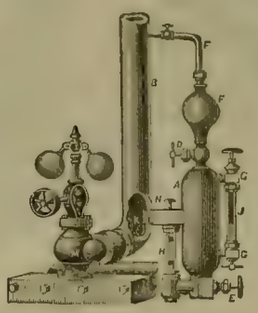
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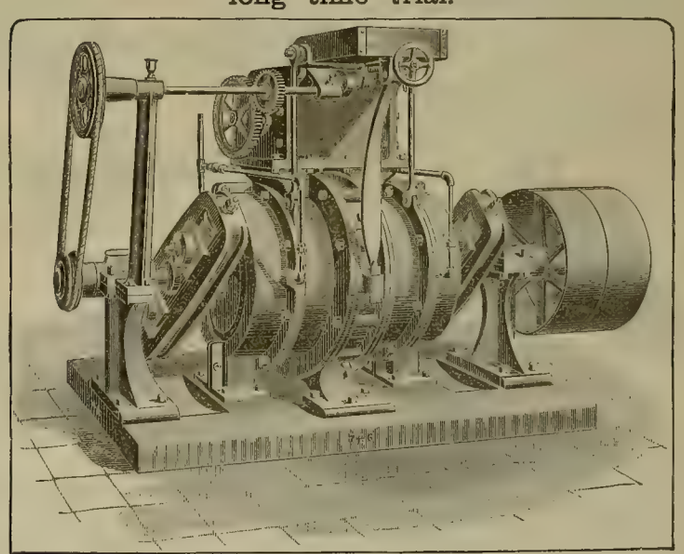
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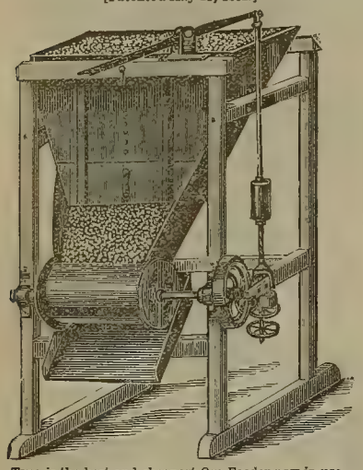


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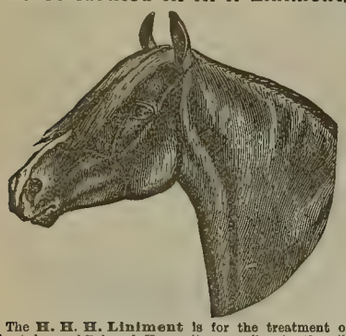
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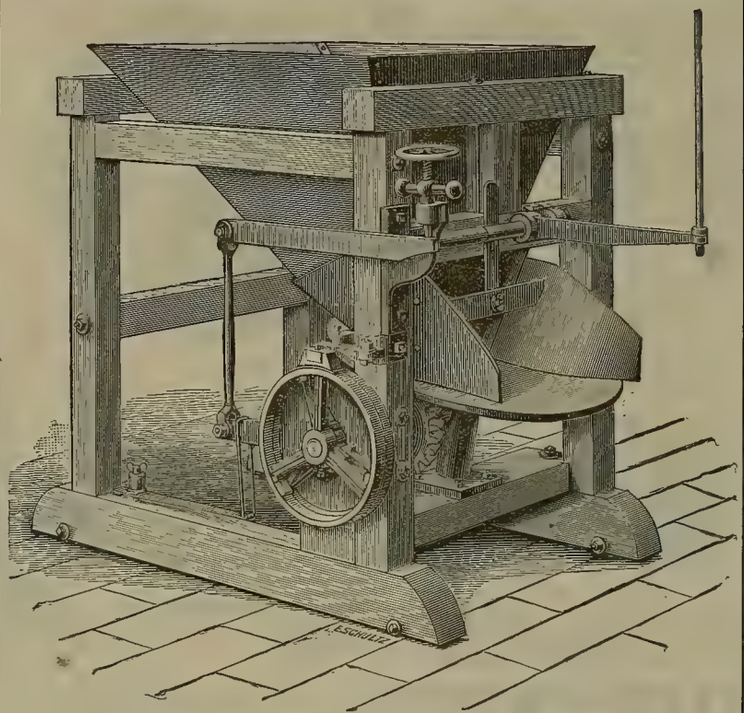


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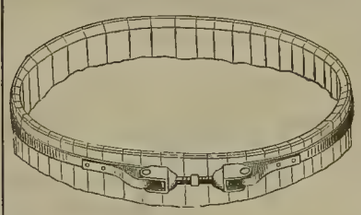
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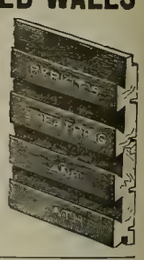
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Congress.

The Fifty-first Congress assembles next Monday under very favorable circumstances. The country is prosperous, the people content, and there is apparently no important question that is likely to divide the members on party lines. It is pleasing to note that all over the country there seems to be a decay of the violence of party strife, that strict party ties are growing weaker, and that the recent State elections have not, in the main, been characterized by those gusts of ugly temper and bickering that has so often turned conventions into bear gardens, and halls of legislation into an arena of political gladiators. The two great political parties are so nearly balanced in power, especially in the House, that no one can afford to put on arrogant airs. In view of this political situation we may reasonably expect that this Congress will be marked as particularly a business Congress.

The first business on the docket after the organization of the House will be the contested election cases, and as there are 18 of these cases, covering about 20,000 pages of printed testimony, all of which must be read, studied and debated, there is certainly no prospect of any important legislation till after the holiday season. With but one exception, all these cases come from the South, and the most interesting one is that of John A. Buchanan, elected from the Ninth Virginia district, who is charged with having secured his election by promising to protect the moonshine whisky people of the mountains in their illicit business.

The steamship subsidy question promises to claim immediate attention. The Pan-American Congress now in session, and the unusual number of memorials coming up from the various Boards of Trade throughout the country, invests this question with a gravity and importance that demands some kind of legislative deliverance. If we can trust the hints and prophecies that come from Washington and other political centers, the dominant party will offer in the House, on the subject of tariff and taxation, the Senate bill rejected by the last Congress, which makes some important reductions in the internal revenue taxes. It is believed that the duty will be taken from sugar, tobacco and alcohol, so far as used in the arts, mechanics and for medicinal purposes, while the imports on woolen goods, finer cottons and hardware, will be increased. The members from the tobacco-growing States are all in favor of removing the tax from that product, and believe that it will be done. Any tariff that passes the House will undoubtedly become a law, as the majority of the Senate are tariff men. Still, tariff legislation is not likely to create any sharply defined party issues, as high tariff and low tariff men are now found on both sides of the House.

The supporters of the bill for the free coinage of silver are preparing to fight hard for it, and are very sanguine of success. The National Silver Convention now in session in the city of St. Louis, composed of delegates largely from the silver-producing States and Territories, have already foreshadowed their action in passing a caucus resolution demanding that Congress pass an Act fixing a day, not later than Jan. 1, 1891, when the Mints of the United States shall be thrown open to free coinage of silver dollars, possessing the present standard of weight and fineness, and pending that time the Secretary of the Treasury be instructed to purchase and coin $4,000.000 per month under existing laws. The National Grange, recently in session at Sacramento, passed a resolution in favor of free coinage of silver, declaring that the depreciation in the market value of that metal had caused a corresponding decline in the leading farm products. Such influential indorsement is certain to cause Congress to give the matter serious consideration.

Another measure in which the great West is specially interested is the irrigation of arid lands. It is known that several bills have been formulated and will be introduced providing for the building of reservoirs and canals with Government money, or to grant tracts for irrigation to private parties on certain conditions. There is no use, however, in disguising the fact that there is a very formidable number of the present Congress who are known to be opposed to the use of Government money for any such purpose until Major Powell and the Geological Survey have finished the examination and mapping of the dry belts of the country. They say it is hardly possible to decide what to do and estimate the cost until the survey is completed.

The necessity of a new bankrupt law will be pressed upon the attention of Congress by a committee appointed for this special purpose by the National Convention that recently assembled at Minneapolis, Minn. While there is a very strong sentiment in favor of this sort of legislation, it would be hazardous to venture a prediction. It is believed that the international copyright bill will be passed, though there is a strong opposition to it. The bill proposing to put the control of Congressional elections into the hands of the Federal Government will meet with stubborn opposition, and its fate is by no means sure. As to pensions, the policy seems to be more liberal than ever before. Pensions for disabled soldiers has ever been one of the humane benefactions of the Government, but in its effusive charity it is now proposed to pension every one who has seen service in the army, whether well or disabled, rich or poor.

The recent investigation of the secrets of the Endowment House at Salt Lake City will no doubt call renewed attention to the treasonable attitude of polygamous Mormonism. It is in evidence that treason has been deliberately preached, and the National flag dragged in the dirt. This malignant cancer still festers and spreads openly and unblushingly in Idaho, Montana, Wyoming, Arizona and New Mexico, in spite of courts and prior legislation, and the moral consciousness of the nation demands a stern repression of the evil.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific States.

FOR WEEK ENDING NOV. 19, 1889.

415,497.—PUMP—F. Cavallero, San Jose, Cal.

415,411.—CONCRETE-MIXING WAGON — Geo. F. Gray, S. F.

415,454.—CONCENTRATOR—James Gray, Camptonville, Cal.

415,551.—CABLE CURVE—S. D. Northcutt, Los Angeles, Cal.

415,301.—WASHING-MACHINE—D. H. Sherwood, Salem, Ogn.

415,302.—STEAM BOILER — John P. Simmons, Los Angeles, Cal.

415,303.—STEAM BOILER — John P. Simmons, Los Angeles, Cal.

415,353.—DIVIDED CAR AXLE—O. Vanorman, Los Angeles, Cal.

415,486. — ANIMAL TRAP — J. F. Warnick, Eugene, Ogn.

415,479 —COLORED FIRE — J. G. Stuttz, San Diego, Cal.

17,198.—TRADE MARK—Creasinger & Co., Los Angeles, Cal.

17,201.—TRADE MARK—J. P. M. Perham, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CONCRETE MIXING AND DELIVERING WAGON. Geo. F. Gray, S. F. No. 415,411. Dated Nov. 19, 1889. This invention consists in a novel wagon, the object of which is to enable the concrete to be mixed at the place where the laying of it is proceeding, and immediately delivered and spread upon said work.

PUMP.—Francesco Cavallaro, San Jose, assignor of one-half to Frank Stock and A. S. Mackenzie of same place. No. 415,497. Dated Nov. 19, 1889. This invention relates to an improved construction for a force-pump for spraying trees, but which may be used equally well in any place where a force-pump may be needed. It consists in the novel construction of the pump cylinder and plunger.

ORE CONCENTRATOR.—James Gray, Camptonville, Yuba Co. No. 415,454. Dated Nov. 19, 1889. This is one of that class of concentrators in which an endless belt is extended over drums at different levels, so as to travel slowly on an inclined plane and receive the material which is to be concentrated and separated. By the peculiar construction the upper end of the table will have the most vibration, the vibration decreasing until at a point about a pivot there is comparatively little or no motion. Then from that point to the lower end of the belt the motion again increases, and in an opposite direction from the motion of the upper part of the belt. The opposite movements of the belt surface will break up the bars or deposits which have a tendency to form if a single side motion is given to the concentrator, these bars forming in a peculiar way across the surface of the traveling belt and interfering with the proper separation of the sulphurets or heavier valuable material from the sand.

The National Silver Convention.

The National Silver Convention convened in St. Louis on last Tuesday. The following States and Territories sent delegates: Arkansas, Arizona, Alabama, Colorado, California, Florida, Idaho, Indiana, Illinois, Kansas, Kentucky, Montana, Missouri, Nevada, North Carolina, Nebraska, New Mexico, New York, Ohio, Oregon, Pennsylvania, Tennessee, Texas, Utah, Virginia and Wyoming.

The Committee on Permanent Organization reported the following permanent officers: Chairman, A. J. Warner of Ohio; vice-chairman, J. M. McMichael, Colorado; secretary, Albert Singer, Missouri; assistant secretaries, F. L. Dana, Colorado; T. J. Palmer, Kansas; J. A. Greer, Pennsylvania.

Chairman Warner, upon being introduced to the convention by Senator Stewart, said that no subject interested the world more than the silver question. Since Germany, in 1872, followed by other European powers and partly by the United States, by demonetization limited silver as money, the question had been a vital issue, and in discussion the bimetallists had won the victory. The attempt to change the money standard from gold and silver to gold alone was worse than a mistake. It was almost a crime. The demonetization of silver had made the gold standard different than before that Act. The demonetization of silver was, in fact, a great crime, and its revocation was now the important question of the world. People had suffered more from bad monetary legislation than from any other cause. The first duty was the stability of finances. What was asked was the restoration of the money standard which existed for ages, and that silver be placed on equality with gold at the ratio which has existed. It was the duty of the country to restore what should never have been disturbed, and this convention had assembled here to decide upon the best methods to be pursued in reaching the desired end.

The Committee on Resolutions is considered a very strong one and is as follows: Arkansas, B. D. Williams; Arizona, John C. Loss; Alabama, A. Irwin; Colorado, T. B. Buchanan; California, Hon. F. M. Pixley; Idaho, William Hindman; Indiana, Peter P. Kennedy; Illinois, Hon. G. E. Waite; Kansas, A. H. McLennan; Kentucky, Henry Watterson; Montana, W. G. Galligher; Missouri, R. P. Bland; Nebraska, William Wallace; New Mexico, J. A. Manzanaris; New York, Thomas Jordan; Nevada, Francis G. Newlands; Pennsylvania, W. J. Chayney; Texas, Charles Longuemare; Utah, C. C. Goodwin; District of Columbia, I. C. Michaels; Michigan, Hon. Ben Colvin; Wyoming, W. M. Grant; Tennessee, A. J. Keller; Virginia, John W. Porter.

A resolution was passed providing for the appointment of a National Executive Committee, to consist of one member from each State, the committee to visit Washington during the session of Congress.

Press telegrams report that the convention is a great success; even the unit standard people admit this. They express surprise at the representation from other than mineral-producing States, and at the character of the men who have come to participate in the deliberations of the convention.

It is understood that the delegates are divided on the Mexican lead question, but it is thought that a majority will favor the ignoring of that question entirely and confining the convention to the silver question. There are men who are supposed to represent President Harrison, who say that the message to Congress next Monday or Tuesday will recommend the coinage of $4,000,000 per month. The Administration, it is said, will go thus far to keep on the right side of the silver States.

Fire at the Anaconda.

On Saturday last a fire was discovered on the 500-foot level of the St Lawrence mine, one of the principal mines of the Anaconda company, Montana. Fortunately there were few men in the mine or in the Anaconda, which mine adjoins and is connected with the St. Lawrence on every level, the fire having broken out during the interval between the night and day shifts. All of these reached the surface in safety.

The draft created by the fire caused the air to suck down through the St. Lawrence shaft, through the levels to the Anaconda, and carried the smoke up the Anaconda shaft. Thus the workings of the St. Lawrence were cleared of smoke, while all of the connecting levels and shafts were filled and the fire doubtless spread into the Anaconda timbers. A solid column of dense smoke issued from the mouth of the shaft.

It was known that quantities of powder were stored in some of the lower levels, the igniting of which meant certain destruction to the great underground workings. At this juncture four men came forward and volunteered to go down and try and get out the powder, and they were at once lowered into the shaft. These were Henry Page, Jerry Sullivan, Pat Murphy and Tim Keleher, and they are entombed and undoubtedly dead, as a party of six soon followed the four unfortunate men into the depths to rescue them, but were forced to abandon their perilous undertaking and return to the surface. The great mine remains hermetically sealed. There is no doubt that fire is still raging among the timbers below. After all the drifts and levels connecting the Anaconda with the St. Lawrence had been thoroughly bulkheaded, the mouth of the Anaconda shaft was treated likewise.

THE White Pine *News*, although making favorable mention of matters at Robinson District, does not record any such excitement, or cause for one, as has been lately published in other papers further away from the mines.

PHELPS, DODGE & Co. of New York have purchased the Senator gold mine, near Prescott, Arizona. The price is supposed to be about $40,000.

LAST week the ore shipments from the Comstock mines to the mills were 5407 tons, yielding bullion valued at about $119,000.

THE statue to the late A. J. Stevens, master mechanic of the Southern Pacific Co., was unveiled at Sacramento on Thursday.

The Academy of Sciences Building.

What is destined to be one of the grandest and most substantial structures in San Francisco is now in course of construction. We refer to the new building of the California Academy of Sciences on Market street, now being built under the provisions of the Lick bequest. Through the courtesy of Capt. Jas. W. Duncan, superintendent of construction, a representative of the MINING AND SCIENTIFIC PRESS was recently permitted to examine the work so far as it had progressed. Though the frontage of the building is elaborate, massive and beautiful, and will be an ornament to the city's great thoroughfare, the observer can, from a mere outside view, form not the slightest conception of the dimensions, scope, strength and beauty of the entire building as it will be when complete. It is being constructed of solid and massive masonry, and no expense is being spared in putting in the very best materials and employing the best procurable talent in architecture and labor in building. To attempt a description of the building in its present stage would occupy more space than we have at our command in this issue, but suffice it to say that from a general observation of the structure as it stands to-day, the merest novice in architecture will realize that the building when complete will not only be unique, but a grand type of architectural and building skill, and that it must have been master minds and master hands that designed and executed the work.

The architects are Messrs. Percy and Hamilton, two of the most talented and competent men in their profession in this city. A deal of praise is also due to the Board of Directors of the Academy, consisting of Col. C. F. Crocker, president; Mr. S. W. Holladay, vice-president; Hon. Geo. C. Perkins and Messrs. Daniel E. Hayes, John Taylor, Irving M. Scott and E. J. Molera, for the close attention they have paid to details, their care and judgment in letting the various contracts, and their determination to have everything in the shape of material and labor of the very best that could be procured.

One feature of the building with which the writer was forcibly impressed is the floors. These, instead of resting on beams, are constructed of concrete, held in place by twisted iron rods of various sizes, timber being entirely dispensed with. These rods hold the floors by tensile strength, and such is the tensility exerted, that in tests made as the work progresses, the floors have resisted an actual pressure of 500 pounds to the square foot without the slightest sign of straining or giving. The advantages of this method of construction are that, not only are the floors the very acme of strength in building, but the floors and ceilings are unquestionably and positively fire-proof, which is saying a great deal when it is considered that so many so-called fire-proof buildings prove anything but fire-proof when they meet the test of fire.

The cement, which forms the most important ingredient of the concrete, is the celebrated Dyckerhoff Portland cement, the very best article procurable anywhere. It is imported from Amoenburg, Germany, where there are immense works devoted to its manufacture. It is compounded on strictly scientific principles, and is a triumph in chemistry in its line; it is notorious that the chemists of Germany are the greatest and most scientific in the world. Superintendent Duncan, who has had wide experience in the construction of buildings and various other structures in which concrete or cement is used, gives it as his opinion that the Dyckerdoff is, on account of its complete uniformity and thorough reliability, not only the most desirable, but the cheapest cement that comes to this market. In this view he is indorsed by George Goodman, the well-known contractor and operator in artificial stone and concrete, who laid the foundations of the building in concrete made with this cement, by Messrs. Ransome & Cushing, the contractors for the concrete work, and by Mr. John McCarty, contractor for the brick work. Messrs. Percy & Hamilton concur in this view, and are more than satisfied with the cement as shown in the work, and many of the leading architects of the city unite in pronouncing it a superior article.

In selecting materials for a work of such importance as the Academy building, it is not cheapness that is sought, but superiority, and builders concede that this German cement fills the bill in this regard. This being the case, it is to be hoped that the Dyckerhoff cement will come into general use in this city in all work where cement or concrete is necessary. The time may come when we may make Portland cement in this State, but until it does we must bring it from abroad; and as the money *must* go out of the country, it makes but little difference whether it goes to Germany or to England, except that if Germany produces a superior article, which this is said to be, we want it in preference; and, besides, Germans are among our best and most enterprising citizens and assimilate to our institutions more readily than the people of other nations. Of course there is no sentiment in business, but all things being equal, one would be apt to give the preference to the people most in accord with his country, and especially would this be the case in regard to an acknowledged superior article. To Mr. Chas. Duisenberg, the well-known commission merchant and ex-German Consul in this city, belongs the credit of introducing this valuable building material, and it is gratifying to him and his principals that the merits of the compound have met such excellent recognition in this city.

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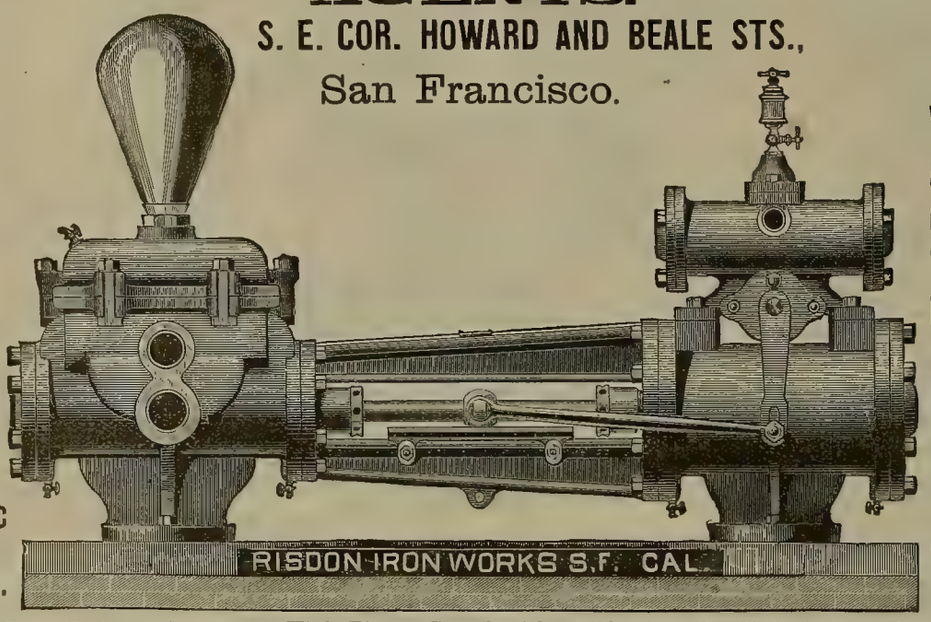
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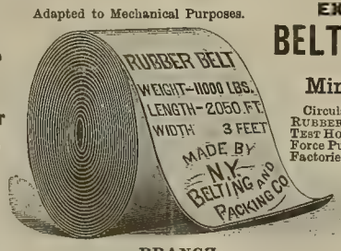
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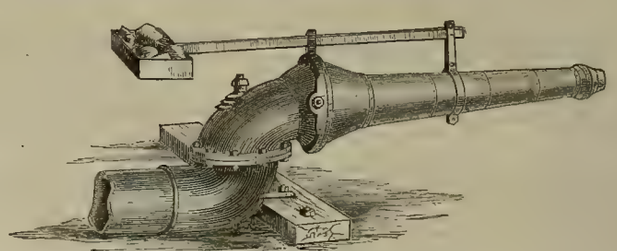
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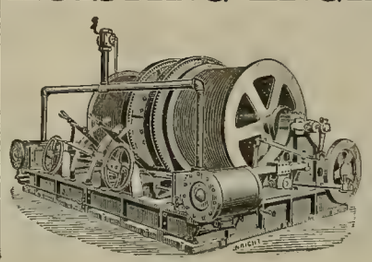
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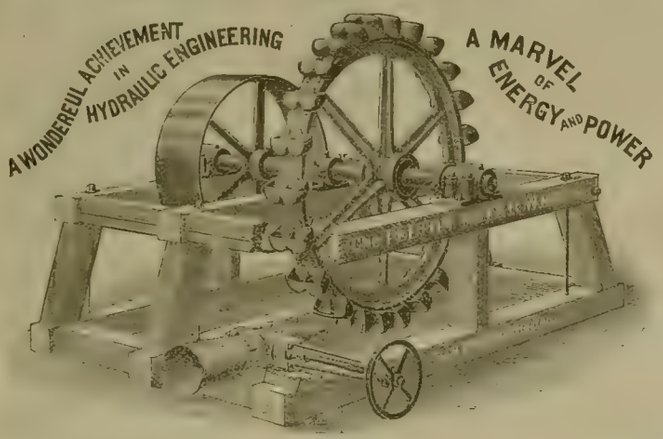
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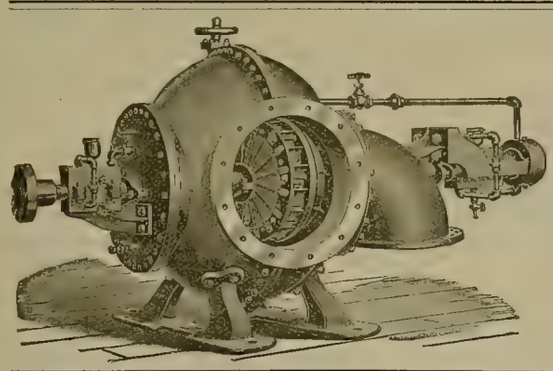
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Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Nov. 27, 1889.

Trade is reported to be fairly active for the season of the year. The generally expressed opinion is that the recent storms have laid the foundation for a very prosperous year. The local money market is reported easy, with all legitimate requirements readily met at bank. The import of over $1,100,000 in sovereigns from Australia for exchange purposes and continued free remittances from the interior, and also neighboring States and Territories, all tend to make an easy-growing money market, and ought, in the natural course of events, to stimulate speculation. The low prices ruling for cereals and hops are a bad feature, but this is largely offset by good prices for other farm products and increasing activity in the mining districts due to a large supply of water. The British steamer Oceanic, hence Nov. 21st, for China, etc., carried the following shipments of treasure :

TO HONGKONG.

Chinese, Mexican dollars	$157,447 00
Chinese gold coin	21,224 00
Chinese gold-dust	40 00
Anglo-Californian Bank, Mexican dollars	160,000 00
Hongkong & Shanghai Bank, Mexican dollars	400,000 00
Total	$738,711 00

TO JAPAN.

Hongkong & Shanghai Bank (bullion)	277,000 00

TO CALCUTTA.

Anglo-Californian Bank (bullion)	117,000 00
Grand total	$1,132,711 00

MEXICAN DOLLARS—The market has ruled strong throughout the week at from 77½ to 77¾ cts., with, toward the close, 77¾ to 78 cts. obtainable. The market is fairly actives.

SILVER—The market made another advance during the past week, reaching in London 44⅜d, the highest figure for three years past. *Money*, a leading speculative-financial paper of London, England, confirms the position of the PRESS by stating that the enlarged demand for silver coin is due to increased prosperity, all labor finding employment at higher wages, and wage-earners preferring silver coin to gold owing to their small expenditures. This desire of the laboring classes has undoubtedly stimulated the bullion purchases of the Exchequer, who also finds in it a basis for the paying out of silver coin in other directions, so as to keep gold locked up as much as possible. He also foresees that England's increased wants for raw material, together with the larger requirements from Brazil and the Argentine Republic, will cause gold to be more largely exported in the near future, and without a substitute, to a reasonable extent, a monetary panic would be invited. Evidently Germany and France also entertain the same views. The agitation of the silver question in this country, and growing feeling in favor of bimetallism, has precipitated the issue and brought it more prominently and favorably to the front in the European countries. In our market at the close it is quotable strong at 97⅛@97¾ cts. per ounce fine.

London'cablesec reived to-day, Wednesday, quote silver at 44 3-16. Our market is quotable at 97⅜ to 97½ cents, with sellers reported asking more.

BORAX—Receipts the present week aggregate 200 ctls., and exports by sea 90 lbs. to Victoria and 19,950 lbs. to New York. The market is reported strong at full quotations and under an active shipping movement.

On yesterday (Tuesday) there was shipped via Victoria 19,651 pounds of borax to Chicago.

QUICKSILVER—Receipts the past week aggregate 139 flasks. There is a continued good home demand at steady prices.

The exports of quicksilver by sea the past week aggregate 453 flasks to Guaymas.

ANTIMONY—The market is reported very strong in sympathy with the East, where the market is reported quite bare.

LIME—Receipts the past week were quite light, aggregating only 2439 bbls. The demand is more of an offish character than noted for some time.

LEAD—The market is reported steady. The Lead Trust at the East is reported to be stronger than ever. It is generally claimed that Congress will take action on the Mexican ore question.

TIN—Exports the past week aggregate 17,400 lbs. tinplate to Guaymas. The market is very dull for spot, while consignments to arrive are provided for. The general feeling is that when the demand sets in, higher prices will rule. Foreign advices report a shade easier feeling.

COPPER—The market shows continued strength. Late foreign advices report the markets very active under large buying—larger than at any time since the collapse of the French Syndicate. As stocks whose prices are based on that of copper are higher, their tending up gives the impression that a concert of action is under way to manipulate for still better prices, provided the output of the mines is not increased so large as to interfere with it.

IRON—Still the markets abroad and at the East are advancing, and this, too, in the face of a large output. English advices report additional orders for iron vessels and heavy orders for all kinds of iron. The impression is that the market is being cornered. The English ironstone furnaces that have been idle for years are to go into blast soon. At the East, supplies are well sold into next year. In our market, values are very strong, with the demand confined as much as possible. It looks as if higher prices will obtain after the turn of the year.

The following are the latest comparative quotations f. o. b. at Glasgow:

F. o. b. Glasgow.	Nov. 20, '89.	Nov. 13, '89.
No. 1 Coltness	77s	77s 6
" Langloan	77s	77s 6
" Summerlee	77s	77s 6
" Gartsherrie	77s 6d	77s 6
At Ardrossa.		
No. 1 Eglinton	65s 6d	65s 6
" Glengarnock	77s	76s
" Dalmellington	68s	66s

COAL—Imports the past week aggregate as follows: From Newcastle, N. S. W., 5028 tons; Nanaimo, 1374; Sydney, 5385; Seattle, 2494; Coos Bay, 750; Departure Bay, 3400; Comox, 4000; total, 22,431 tons. Free imports of coast and continued mild weather cause household coals to be easier, although no reduction in quotations is reported. Owing to the large addition to our population, the consumption shows a decided increase in all kinds of coal, so that importers and agents are not disposed to press sales for fear that the weather may set in colder and under stronger buying stocks be depleted. Australian for shipment, after the turn of the year, is reported very strong, with some naming $8 to $8.25, according to grade.

Eastern Metal Markets.

By Telegraph.

NEW YORK, Nov. 27, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	44	95¾	$13 00	$3 80	$21 35
Friday	44⅛	96	13 00	3 80	21 40
Saturday	44⅛	96¼	13 00	3 80	21 45
Monday	44⅛	96⅜	13 25	3 82½	21 60
Tuesday	44⅜	96⅜	13 25	3 82½	21 35
Wednesday	44⅜	96⅜	13 25	3 82½	21 30

NEW YORK, Nov. 26.—Borax continues to rule firm under a good demand. Quicksilver is steady. Tin shows an easier feeling, yet the undertone appears to be firm. Iron is in continued active demand, with prices well maintained. Copper still meets with a strong consumption and speculative demand.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, November 21, 1889.

ANTIMONY		— @ —
BORAX—Refined, in carload lots	7¼@	7⅝
Powdered " " "	7¾@	
Concentrated " " "	— @	6¾
All grades jobbing at an advance.		
COPPER—		
Bolt	21 @	22
Sheathing	22 @	24
Ingot, jobbing	16 @	18
do, wholesale	14 @	15
Fire Box Sheets	22 @	24
LEAD—Pig	4½@	—
Bar	5 @	—
Sheet	7 @	—
Pipe	6 @	—
Shot, discount 10% on 500 bags Drop, ₰ bag.	1 45 @	—
Buck, ₰ bag	1 65 @	—
Chilled, do	1 85 @	—
STEEL—English, ₰ lb	16 @	20
Canton tool	9 @	9
Black Diamond tool	9 @	9
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4¼@	—
TINPLATE—B. V., steel grade, 14x20, P. S.	5 25 @	—
B. V., steel grade, 14x20, spot	4 90 @	5 10
Charcoal, 14x20	6 75 @	7 00
do roofing, 14x20	5 50 @	—
do, do, 20x28	11 00 @	—
Figtin, spot, ₰ lb	23 @	25
COKE—Eng., ton, spot, in blk & sks, resptvly	16 00 @	18 00
Do, do, to load	13 50 @	14 50
QUICKSILVER—By the flask	48 00 @	48 50
Flasks, new	@	—
Flasks, old	37 @	
CHROME IRON ORE, ₰ ton	10 00@	—
	Spot.	To Load.
IRON—Glengarnock ton	32½@	—
Eglinton, ton	32½@	—
American Soft, No. 1, ton	@35 00	32½@ —
Oregon Pig, ton	@35 00	@ —
Clay Lane White	@28 00	26 @
Shotts, No. 1	35 00 @35 00	32½@ —
Bar Iron (base price) ₰ lb	— @	— @
Langloan	35 00 @	32½@ —
Thorncliffe	35 00 @	32½@ —
Gartsherrie	35 00 @	32½@ —

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$20 00	$17 00
41 to 50 ft	21 00	18 00
51 to 60 ft	23 00	20 00
61 to 70 ft	27 00	21 00
1x3, fencing	22 00	19 00
1x4, "	21 00	18 00
1x3, 1x4 and 1x6, odd lengths	19 00	16 00
Second quality	17 00	15 00
Selected	24 00	22 00
Clear, except for flooring	31 00	28 00
Clear for flooring	2 00	.....
Clear V. G. No. 1 flooring	6 00	.....
Firewood	14 00	10 00
Dressed Pine, flooring, No. 1, 1x6	32 00	29 00
No. 1, 1x4	34 00	30 00
No. 1, 1¼x4, 1¼x6, and odd sizes	37 00	33 00
All sizes, No. 2	27 00	24 00
Stepping, No. 1	44 00	35 00
Stepping, No. 2	34 00	25 00
Ship timber and plank, rough	27 00	18 00
Selected, planed 1 side, ar'ge 40 ft	29 00	24 00
" " 2 " " "	31 00	26 00
" " 3 " " "	33 00	28 00
" " 4 " " "	35 00	30 00
Deck plank, rough, average 35 ft	35 00	32 00
Dressed, average 35 feet	40 00	35 50
Pickets, rough, B. M	20 00	16 00
¼x1½, 4 ft long, ₰ M	6 50	5 00

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	7 75 @ 8 00	Cardiff	9 50@10 00
Liverpool St'm	8 50 @—	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	9 00 @ 9 00	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Seattle	7 00
Scotch Splint	9 00	Coos Bay	6 00
Greta	9 00	Cannel	12 00
Westminster Brymbo	9 00	Egg, hard	18 00
Nanaimo	9 00	Cumberland, in sacks	19 00
Sydney	8 0	do, bulk	18 00
Gilman	7 00		

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Hanauer, Nov. 19, $2300; Occidental Con., 23, $6137; Hale and Norcross, 23, $46,577; Savage, 23, $29,948; Hanauer, 20, $4440; Con. California and Virginia, 23, $65,379; Germania, 23, $5698; Hanauer, 23, $2000.

A DISASTROUS conflagration at Lynn, Mass., on Tuesday, burned 40 of the great shoe factories of that place, and has thrown over 2000 operatives out of work. The total loss is estimated at $10,000,000.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T.	LEVIED.	DELING'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Belcher M Co	Nevada	13	50	Oct 17	Nov 20	Dec 11	John Crockett	327 Pine St
Booth G M Co	California	4	2	Nov 23	Dec 28	Jan 20	Geo R Spinney	310 Pine St
Con Imperial M Co		26	5	Nov 22	Dec 27	Jan 15	C L McCoy	329 Pine St
Calaveras Blue Gravel Co	California	4	3	Nov 15	Dec 23	Jan 14	B Burris	240 Montgomery St
California State Co	California	5	25	Oct 21	Nov 26	Dec 23	J O Hanscom	9 Mission St
Con Pacific M Co	California	11	10	Nov 1	Dec 5	Dec 23	F R Luty	330 Pine St
Chollar M Co	Nevada	28	50	Nov 1	Dec 4	Dec 24	O E Elliott	309 Montgomery St
Del Monte M Co	Nevada	2	20	Oct 28	Dec 3	Dec 26	J W Pew	310 Pine St
Golden Jacket M Co	Nevada	3	10	Oct 14	Nov 21	Dec 20	R G McClellan	331 Montgomery St
Gould & Curry M Co	Nevada	63	30	Oct 15	Nov 18	Dec 11	A Durbrow	399 Montgomery St
Grand Prize M Co	Nevada	23	30	Nov 21	Dec 24	Jan 15	R R Grayson	329 Pine St
Gray Eagle M Co	California	15	6	Oct 16	Nov 18	Dec 10	J M Buffington	303 California St
Locomotive M Co	Arizona	5	5	Oct 19	Nov 25	Dec 17	A H Fish	309 Montgomery St
Lapanita Con M Co	Nevada	2	02	Oct 2	Nov 8	Dec 2	J Stadfeldt	309 Montgomery St
Mexican M Co	Alaska	1	25	Oct 11	Nov 11	Dec 2		
Mono G M Co	California	29	25	Nov 18	Dec 23	Jan 24	B L Burling	309 Montgomery St
Navajo Queen M Co	Nevada	2	10	Oct 23	Nov 26	Dec 11	J F Holling	533 Kearny St
North Gould & Curry M Co	Nevada	11	20	Nov 6	Dec 7	Dec 27	G H Mason	331 Montgomery St
Nevada Queen M Co	Nevada	6	20	Oct 31	Dec 4	Dec 30	H Deas	309 Montgomery St
Phil Sheridan Con M Co	Nevada	4	10	Oct 22	Nov 26	Dec 11	J F Holling	533 Kearny St
Peerless M Co	Arizona	13	10	Oct 11	Nov 19	Dec 10	A Waterman	309 Montgomery St
Palisade M Co	Nevada	2	5	Nov 1	Dec 16	Jan 9	D Buck	309 Montgomery St
Platt & Gilson G M Co	California	4	3 00	Nov 13	Dec 20	Jan 6	C Herrmann	326 Kearny St
Russell Reduction & M Co	California	5	5	Nov 11	Dec 16	Jan 8	J Morizio	338 Montgomery St
Sierra Nevada	Nevada	96	50	Oct 5	Nov 3	Dec 7	E L Parker	309 Montgomery St
Seg Belcher & Midas Co	Nevada	4	25	Oct 7	Nov 4	Dec 8	E A Holmes	309 Montgomery St
Savage M Co	Nevada	74	50	Nov 5	Dec 10	Dec 30	E B Holmes	309 Montgomery St
Summit G M Co	California	11	5	Nov 14	Dec 20	Jan 14	B L Burling	309 Montgomery St
Tuscarora Con M Co	Nevada	2	10	Oct 12	Nov 15	Dec 5	J J Scoville	309 Montgomery St
Trojan M Co	Nevada	18	10	Oct 23	Nov 26	Dec 11	J F Holling	533 Kearny St
Utah Con M Co	Nevada	8	25	Oct 23	Nov 26	Dec 16	A H Fish	309 Montgomery St
Union Con M Co	Nevada	39	25	Oct 8	Nov 9	Dec 13	J M Buffington	303 California St
Vine Spring M Co	California	1	15	Oct 10	Nov 11	Dec 9	F S Snell	218 Sacramento St

MEETINGS TO BE HELD.

NAME OF COMPANY	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Head Center & Tranquility M Co	Ariz.	J W Pew	310 Pine St	Annual	Dec 10
Mexican M Co	Nevada	C E Elliott	309 Montgomery St	Annual	Dec 3

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Champion M Co		T Wetzel	522 Montgomery St	10	Oct 15
Caledonia M Co	Nevada	A S Cheminant	328 Montgomery St	08	Aug 5
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	Sept 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	Aug 25
Idaho M Co	California		Grass Valley	5 00	Nov 7
Mt Diablo M Co	Nevada	R Heath	319 Pine St	30	Oct 23
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Nov 10

Mining Share Market.

The mining share market the past week has again proven the correctness of inside points of lower prices. The points now out are for higher range of values, but whether on a showing of ore in one or more of the Comstock mines, on a short interest or on a bull movement maintained by twenty-dollar pieces, remains to be seen. There is no doubt but the better-informed operators have no confidence in the stability of the market and look for still lower prices in the near future. This opinion, no doubt, is based on well-grounded fears of assessments to be levied by several of the companies and more extensive deadwork. It is claimed that Con Virginia will pay a 50-cent dividend in next month, and with proper management Hale & Norcross might be able to declare a dividend in the near future, but whether the Savage Co. will remains to be seen. The president of the company has been buying property, or at least, so shows the official records of real estate transactions. By the way, the same gentleman informed the writer that he does not know what the milling charges are on the ore milled for the mines, of which he is president; as did A. K. P. Harmon express ignorance of the milling charges on the ore being milled by the Chollar Mining Co., of which company he is president. With such profound ignorance on the part of the presidents, how can stockholders expect to have their rights looked after? The mill and transportation charges on Con Virginia ore are $7 a ton and that on Challenge $5 for milling and $1 for transportation—a reduction on the latter of $1.25 a ton since July 1st of this year. It is claimed that the latter reduction by the Union Mill & Mining Co. is uniform. There is a feeling in certain well-informed quarters that the milling charges should be regulated according to the grade of ore, low-grade ore costing more to crush than does high-grade. Outside stocks, in sympathy with the Comstocks, have been dull and heavy, with a shading in values. It looks as if the manipulators of the Quijotoas, Tuscaroras and Bodies are waiting for a move in the Comstocks so as to advance their stocks. The Tuscarora mines have stopped shipping bullion by telegraph, while the Bodies have none to ship, either by telegraph, mail or express.

The manipulators of the Comstock share markets have succeeded most admirably in keeping reliable news of the work in the mines from the public, so all that can now be had is what they deign to give through official sources, which are like bones with very little meat. The better-informed and most experienced operators look with confidence upon the situation, and expect in the near future confirmed reports of an ore development in some of the more promising mines. As each group of mines has its friends, it is difficult for an outsider to form a correct idea when the ore strike will be made; but experience has taught the writer that it invariably comes in the mine whose stock is the best concentrated. There is no question but work of the most important character is being vigorously pushed in each group of mines. The ore output from the bullion-producing mines is being increased, while other mines will at an early day be added to the list. From the outside mines the news is of interest from the Quijotoas and Tuscaroras, but from the Bodies the old stale official reports of driving ahead come to hand. The controllers of these peculiarly managed mines should change the character of the official reports if they wish the public to pay assessments.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, department 10, San Francisco:

PACIFIC COAST IMPROVEMENT CO., Nov. 25. Object, to manufacture, buy and sell sewer-pipe. Capital stock, $100,000. Directors: I. K. Luttrell, J. J. Loriness, H. Hoyt, E. P. Fish, A. J. Meany, A. A. Hoyt and J. M. Day.

SAN LEANDRO GAS AND ELECTRIC LIGHT CO., Nov. 25. Capital stock, $100,000. Directors: William J. Landers, R. C. Hawes, James A. Goodwin, F. B. Reynolds and S. A. Brooks.

PACIFIC OXYGEN AND SANITARY ASSOCIATION, Nov. 26th. Object, to manufacture chemicals, drugs and apparatus. Capital stock, $10,000. Directors, C. C. Vanderbeck, G. T. Mason, D. B. Green, F. H. Merzback, and Eugene W. Levy.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov. 7.		WEEK ENDING Nov. 14.		WEEK ENDING Nov. 21.		WEEK ENDING Nov. 26.	
Alpha	1.30	1 50	1.35	1.55	1.35	1.40	1 30	1 40
Alta	2.10	2.25	2.15	2.30	2.10	2.15	2.00	2.15
Andes	.60	.70	.65	.75	....	....	....	....
Belcher	2.25	2 70	2.25	2.45	2.30	2.95	2.60	2.95
Best & Belcher	3 25	3.85	3.40	3.75	3.25	3.6	3.10	3.40
Bullion	.60	.70	.60	.70	.60	.65	.55	.65
Bodie Con	.65	.75	.65	.75	.60	.70	.60	....
Benton	3.25	3.25	3.25	....	....	....	4.50	....
Bulwer	.25	.35	.30	.35	.30	....	....	....
Commonwealth	3 00	3.10	3.05	3.20	2.95	3.05	3.00	....
Con. Va. & Cal	6⅝	6⅞	6¾	7	6.50	6⅝	6 00	6.50
Challenge	2.10	2.50	2.05	2.10	2.05	2.20	1.90	2 25
Chollar	1.60	2.00	1.65	1.90	1 65	1.85	1.55	1.75
Confidence	.55	.60	55	57	5.00	....	44	47
Con. Imperial	.25	.30	.35	....	.35	....	.30	.35
Caledonia	.25	....	....	....	....	....	....	....
Crown Point	2.60	3.00	2 65	2.95	2 55	2.75	2.50	2.70
Crocker	.40	.50	.35	.40	....	....	.30	....
Eureka Con	4.10	4.50	4.10	4.40	....	....	4.00	....
Exchequer	.55	.70	.65	.70	.60	....	....	....
Grand Prize	.80	.90	.80	.85	.75	.75	.45	.60
Gould & Curry	1.50	1.85	1.55	1.80	1.55	1.95	1.65	1.85
Hale & Norcross	2.95	3.20	3.00	3.20	3.00	3.15	2.90	3.10
Julia	.30	.45	.40	.60	.40	.45	.35	.40
Justice	1.70	2.00	1.65	1.80	1.60	1.75	1.75	....
Kentuck	1.05	1.20	1.15	....	....	....	....	....
Lady Wash	.40	....	.40	....	.40	.45	.40	....
Mono	.55	.65	.50	.60	....	....	....	....
Mexican	3.65	4.20	3.70	4.10	3 70	4.00	3.10	3.75
Navajo	....	....	.30	.35	....	....	.25	....
North Belle Isle	.90	1.00	1 05	1.55	1.20	1.25	1.15	....
New Queen	.65	.70	.75	1.00	.80	....	.75	....
Occidental	1.15	1.35	1.20	1.30	1.25	1 35	1.15	1.30
Ophir	4.30	4.95	4.60	4.95	4.50	4.80	4.00	4.50
Overman	.90	1 05	.95	1.05	95	1.05	.95	1.00
Potosi	1.07	2.05	1.75	2.00	1.50	2.0	1.70	1.90
Peerless	.25	.30	.20	.35	.30	.35	.30	....
Piper	.15	....	.15	.25	15	....	....	....
Savage	1 45	2.00	1.55	1.75	1.50	1.65	1 40	1.55
S. B. & M	1.15	1.50	1.61	1 70	1.55	1.60	1.30	1 55
Sierra Nevada	1.70	2.20	2.50	2.70	2.55	2.85	2.50	2.75
Silver Hill	.55	.50	.45	.50	.40	.45	.40	.45
Scorpion	....	....	.25	....	.25	....	.25	....
Union Con	2.70	3.15	3.10	3.45	3.20	3.60	2.90	3.45
Utah	.80	.90	.70	.80	.65	.75	.70	.90
Weldon	....	....	....	....	....	....	.15	....
Yellow Jacket	2.75	3.25	3.00	3.20	2.85	3.05	2.75	2.95
	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY, Nov. 27, 9:30 A. M.

20	Challenge	1.90	
250	Chollar	1.65	
650	Commonwealth	3.05	
100	Crown Point	2.50	
200	Dudley	65c	
100	Grand Prize	85c	
200	Gould & Curry	1.75	
100	Hale & Nor	3.00	
100	Justice	1.65	
100	Mexican	3.20	
50	Navajo	30c	
150	Ophir	4.20	
100	Potosi	1.80	
50	Savage	1.50	
100	S. B. & M	1.50	
200	Sierra Nevada	2.65	
100	Utah	90c	
200	Union	3.15	
300	W Comstock	25c	
150	Yellow Jacket	2.80	
200	Y A Sou	65c	

An Arkansas Wagon-Brake.

"E," writing to the Stockton *Independent* from Hot Springs, describes an Arkansas invention that he has noticed, as follows:

It is a new style wagon-brake. It does not require a skilled mechanic to manufacture it and there is no patent applied for. To make one, cut down a sapling five or six inches thick, cut it of the right length for a brake-bar; swing it under the wagon-bed close to the hind wheels, an old rope or strip of rawhide can be used for the purpose; now bore an auger hole in the starboard end of the brake-bar, between the wagon bed and wheel; this hole must slant backward at an angle of 45°; use a small sapling four or five feet long for a handle, whittled to fit the slanting auger hole; then attach a small rusty chain to the center of the hind axle and make the other end fast to the center of the brake-bar. The driver then ties a baling-rope to the upper end of the handle and takes the other end in his hand. When he wants to put on the brake he pulls the rope, and as the upper end of the handle goes forward the brake-bar rolls and shortens the chain attached to the axle; this movement brings the brake-bar in contact with the hind wheels. It works well. The entire cost of this brake, labor included, is 35 cents.

The Democratic party of Arkansas do not claim that the high tariff affects the price of this brake in the least.

Wonderful Tree Growths.

EDITORS PRESS:—Forestry Bulletin, No. 6, sent out by Forester Lyon, is a very valuable and useful document for tree-planters. It shows the relation of the growth of trees to the soil on which they are planted. Hitherto, climate or soil-humidity has been about all that has been considered in tree-planting in California. It will be seen by this bulletin that the constituents of the soil are an exceedingly important factor in tree growth. Some trees do fairly well on any of the soils tried, but others show marked affinities for some soils and do nothing or actually die on others, with the general conditions in both cases similar. The Forestry Experimental Stations under the conduct of so intelligent an observer as Forester Lyon will do more than anything that has ever been done to encourage tree-planting. By the system now commenced at Santa Monica, and soon, let us hope, to be extended to the other stations, a tree-planter can obtain exact information as to the best trees for any climate in the State.

Since Bulletin 6 was issued I have had some measurements of the trees reported on made, and also measurements of one or two others. The measurements of the Forestry Station trees were made on Oct. 14th, or nine months from the planting of the little seedlings.

	Hight, ft.
1 Eucalyptus polyanthema (Var.)	19½
1 " " "	16
2 " " "	16
2 " " "	15
1 " viminalis "	19

These trees are all on the side of a hill in the Santa Monica canyon, and have had no cultivation or care; per contra, there is a living stream ten to twenty feet below them, and a considerable distance to one side, which may have helped them. The record, however, is extraordinary under any circumstances. The tallest tree has grown two and seventeen-hundredths feet per month during the time observed. The E. globulus or blue gum on the same hillside has done nothing to compare to these growths.

We must surmise that there is something especially favorable in the canyon conditions to the growth of the Polyanthema and Viminalis. A number of other varieties in this location have exceeded in growth the blue gum, but not to so phenomenal an extent. Among these is that very attractive eucalyptus of which we are not yet certain of the name. We had it at first as the E. gomphocephala (Tooart gum), then Australian seed from Baron Von Muller sent us as E. Cornuta (Yate) came up looking exactly like the former tree, and lately we have had some seed sent as E. diversicolor (Karri), which appears similar. All of these trees are splendid and useful, so it does not matter much which it turns out to be. The Karri is one of the giants of the world of the forest, and attains a hight of 400 feet. The Yate and Tooart are both large and valuable timber trees. There is this observation to be made, however, in regard to these trees, and that is that should they turn out to be E. gomphocephala, it would not be wise to plant them largely far from the coast until more experiments have been tried. This tree has not been found in Australia anywhere except on the western coast seashore, and may not be suited to inland conditions.

These trees, whatever they are, hold a pleasant green color not common to the Eucalypti, and are umbrageous. It may be interesting and useful to compare the growth of some trees on a high, dry bluff some 200 feet above the sea, also growing without care with those in the canyon.

	Hight.
1 E. Viminalis (mauna gum) planted July 10, 1888	20 ft.
1 E. Viminalis (mauna gum) planted July 10, 1888	19 ft.
1 E. polyanthema (Red box) planted Dec. 15, 1888	12 ft. 10 in.
2 E. polyanthema (Red box) planted Dec. 15, 1888	11 ft, 8 in.

The conditions at Santa Monica are too good to be depended on by the general tree-planter. But it is, on the other hand, probably the finest nursery or propagating station in the world, and it seems no exaggeration to expect that this station is capable of being made the finest and most complete arboretum in the world.

Already it has been found that trees and plants which will not thrive, nor even live in some cases no farther off than Los Angeles, do splendidly here. Prof. C. S. Sargent, the eminent botanist of the East, editor of *Garden and Forest*, and chief of the celebrated Arnold Arboretum, writes me with prophecies of the great results the Santa Monica station should achieve. The tree-planting season is approaching, and the indications are for a larger planting than we have ever had.

ABBOT KINNEY.

Santa Monica, Nov. 16 1889.

THE office of the United States Geological Survey in this city will be abandoned at an early date and its business transferred to Washington. Major Powell, who had charge of the local office, will resume his survey of arid lands.

FRANK PIXLEY has started a new industry at the town named for him in Tulare county. He has imported some diamond-back terrapin from Washington, which he intends to breed in a swamp on his property.

Assessment Notices.

Booth Gold Mining Company. Location of principal place of business, San Francisco, California. Location of Works, Auburn, Placer Co., Cal.

NOTICE is hereby given that, at a meeting of the Board of Directors, held on the 23d day of November, 1889, an Assessment, No. 4, of Two(2) Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin, to the Secretary, at the office of the Company, No. 310 Pine Street, Room No. 28, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of December, 1889, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the 20th day of January, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

GEO. R. SPINNEY, Secretary.

Office, No. 310 Pine Street, Room No. 28, San Francisco, California.

DELINQUENT SALE NOTICE.

Gray Eagle Mining Company, Location and principal place of business, San Francisco, California. Location of Works, Placer Co., Cal.

NOTICE.—There are delinquent upon the following described Stock, on account of Assessment (No. 15), levied on the 16th day of October, 1889, the several amounts set opposite the names of the respective Shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
Brown, G. A.	463	100	$ 6 00
" G. A., Trustee	464	5,000	300 00
" " "	465	2,500	150 00
Bogart, O. H., Trustee	414	500	30 00
" " "	428	100	6 00
" " "	430	100	6 00
" " "	431	100	6 00
" " "	432	100	6 00
" " "	433	100	6 00
" " "	435	50	3 00
" " "	436	100	6 00
" " "	447	5,000	300 00
" " "	470	1,000	60 00
" " "	484	200	12 00
" " "	485	200	12 00
Colton, A. O, Trustee	243	100	6 00
" " "	244	100	6 00
Carnes, W. A.	252	416	24 96
Chase, O. A., Trustee	419	3,814	228 84
Durning, T. G., Trustee	231	440	26 40
Ettlinger, Isaac	137	600	36 00
Field, W. A.	403	100	6 00
Francis, H. L., Trustee	444	1,500	90 00
Gray, H. W., Trustee	446	200	12 00
Horton, Thos. R., Trustee	315	5,000	300 00
Hersey, C. S.	95	200	12 00
Hall, Wm. E.	131	900	54 00
"	154	1,000	60 00
Hall, Wm. E., Trustee	411	200	12 00
" " "	412	200	12 00
Nash, H. W.	269	104	6 24
Rosekrans, H. M.	39	600	36 00
Riordan, Thos. D.	491	12	72
" Thos. D., Trustee	415	500	30 00
" " "	416	500	30 00
" " "	417	500	30 00
" " "	418	500	30 00
" " "	492	500	30 00
Stout, C. S.	486	100	6 00
" " Trustee	422	106	6 36
" " "	476	2,000	120 00
Scarles, W. A., Trustee	129	250	15 00
" " "	322	250	15 00
" " "	429	1,040	62 40
Shankland, Robt.	144	600	36 00
" "	173	400	24 00
Taylor, J. N.	102	1,000	60 00
" "	330	40	2 40
Waller, L. P. F., Trustee	358	100	6 00
" " "	367	3,000	180 00
" " "	458	100	6 00
" " "	459	100	6 00
" " "	460	100	6 00
Winn, A. H., Trustee	466	1,000	60 00
Wetzel, Theo, Trustee	337	40	2 40
" " "	360	1,000	60 00

And in accordance with law, and an order of the Board of Directors, made on the 16th day of October, 1889, so many shares of each parcel of such Stock as may be necessary, will be sold at public Auction, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California, on TUESDAY, THE TENTH (10th) DAY OF DECEMBER, 1889, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

J. M. BUFFINGTON, Secretary.

Office, Room 11, No. 303 California St., San Francisco, California.



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This practical work of 288 pages gives with full illustrations and complete detail how to build or repair all kinds of mill dams. Pains have been taken to thoroughly illustrate dam construction and rudimentary hydraulics. It contains fine cuts of all the well-known dams now in use, with a complete description as to their mode of construction. Mill owners will find this a valuable work of reference. Besides complete directions for building and repairing all kinds of dams, it contains much other valuable information regarding hydraulics, in all its branches. No engineer can afford to be without this handy pocket assistant.

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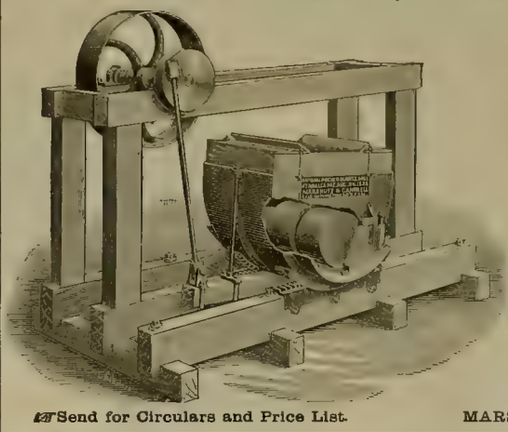
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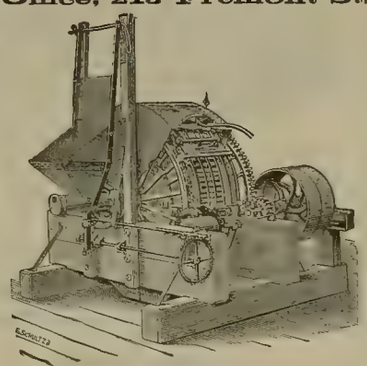
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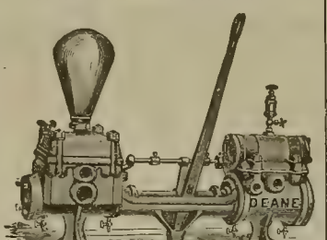
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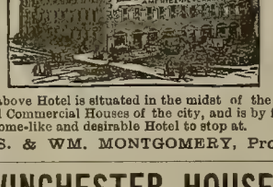
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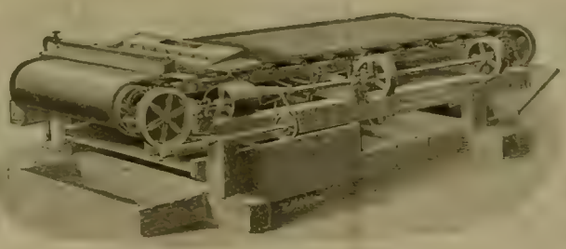
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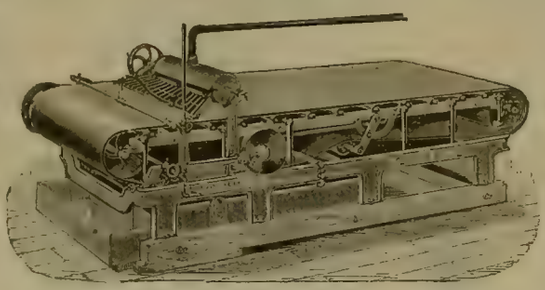
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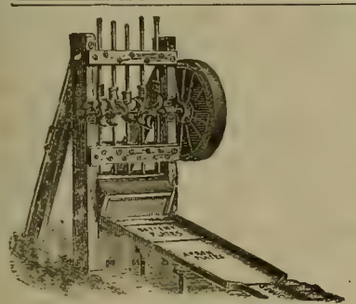
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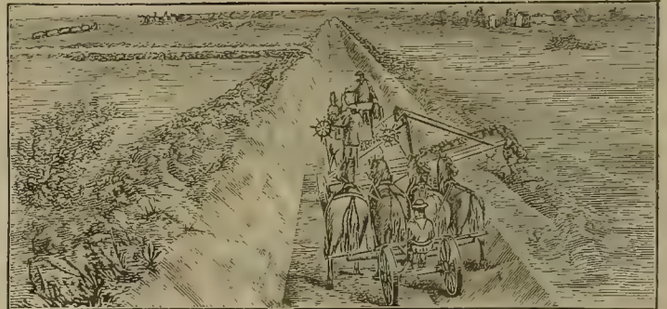
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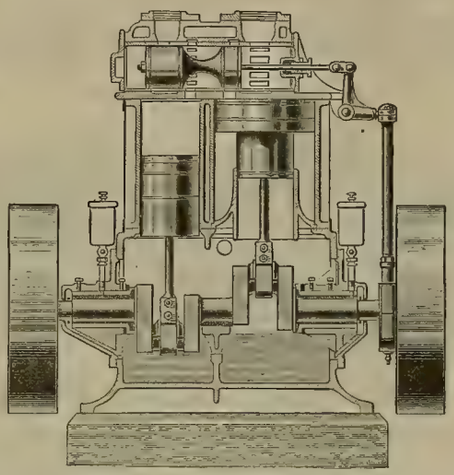
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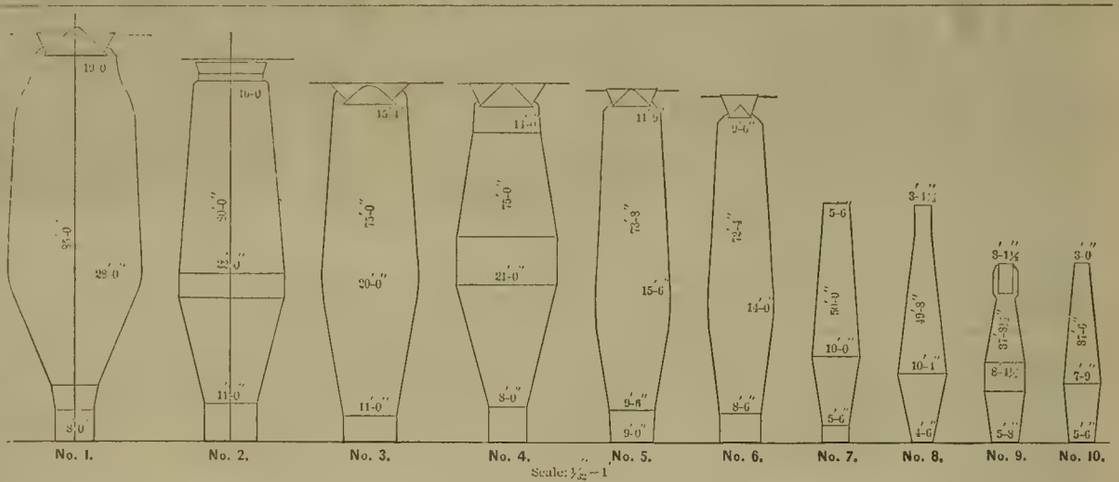
Blast-Furnace Lines.

Last summer we gave in articles in the PRESS the lines of various blast-furnaces, from a paper read before the American Institute of Mining Engineers by Edward Wash Jr. of St. Louis. He considers the main requirements of a blast-furnace to be: First, that it should be a good generator of carbonic oxide gas; secondly, that the gas thus produced should be used as effectively as possible on the materials to be treated. In his former paper he attempted to show that "by placing the bosh or widest diameter of the furnace entirely and safely within the zone of complete fusion," "a constant supply of fuel before the tuyeres would be secured." Under this condition (with the aid of a reliable blowing-engine) the furnace becomes, within the fusion-zone, an excellent gas-producer, thereby, as it would seem, entirely meeting the first requirement.

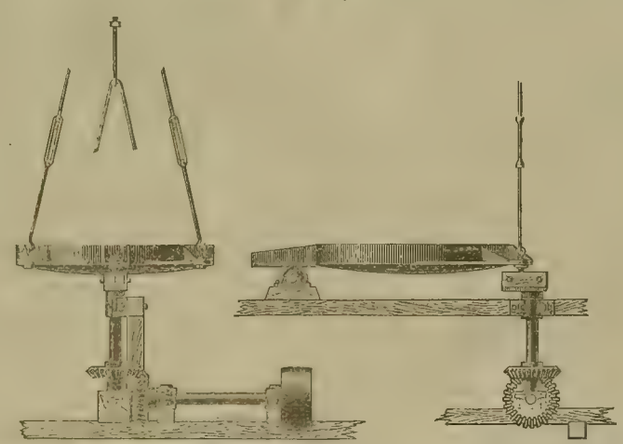
The statement of his original paper, "Hence we may conclude that the more narrow, within practical limits, the furnace shaft is constructed, the more thorough and the more energetic the actions of reduction and carbon impregnation will be," etc., was deliberately made. He has failed to observe anything since to make him alter the practical conclusion there reached.

To show that the views are correct, he now submits outlines of a few furnaces with comparative data of their work. The Union, No. 2 (Fig. 6), and the Triebach, No. 3 (Fig. 8)—which require less coke and charcoal respectively per ton than any furnaces that have come under observation—do not owe their low fuel consumption to large cubical capacity, to the employment of high temperature of blast, or to the great length of time the materials are allowed to remain in the furnaces.

No. 1 of the furnaces shown in the cuts is the Newport of Newport, England. It has a capacity of 30,000 cubic feet, a daily product of 70 tons, and uses 2308 pounds of fuel per ton of metal. No. 2, the Edgar Thompson "F," Pittsburg, has 18,000 feet cubic capacity, a daily product of 270 tons; fuel per ton of metal, 1863 pounds. No. 3 is the North Chicago; cubic capacity, 15,000; daily product, 175 4 tons; fuel per ton of metal, 2116 pounds. No. 4 is the North Lonsdale, Lancashire, England; cubic capacity 14,000 feet; daily product, 107 1 tons; fuel per ton of metal, 2130 pounds. No. 5 is the Union of Chicago; cubic capacity, 8824 feet; daily product, 142 tons; fuel per ton of metal, 1943. No. 6 is the Union No. 2, Chicago; cubic capacity, 6676 feet; daily product, 114.3 tons; fuel per ton of metal, 1697 pounds. All of the above are coke furnaces. Of the charcoal furnaces, No. 7 is the Midland, Crawford Co., Mo.; cubic capacity, 2000 feet; daily product, 48 tons; fuel per ton of metal, 1870 pounds. No. 8 is the Triebach of Triebach, Austria; cubic capacity, 1872 feet; daily product, 24 tons; fuel per ton of metal, 1365 pounds. No. 9 is the Ferdinand furnace of Hieflau, Austria; cubic capacity, 1235 feet; daily product, 24 tons; fuel per ton of metal, 1653 pounds. No. 10 is the Wrbna of Eisenerz, Austria; cubic capacity, 1000 feet; daily product, 20 tons; fuel per ton of metal, 1585 pounds.



LINES OF TEN BLAST FURNACES IN THIS COUNTRY AND ABROAD.

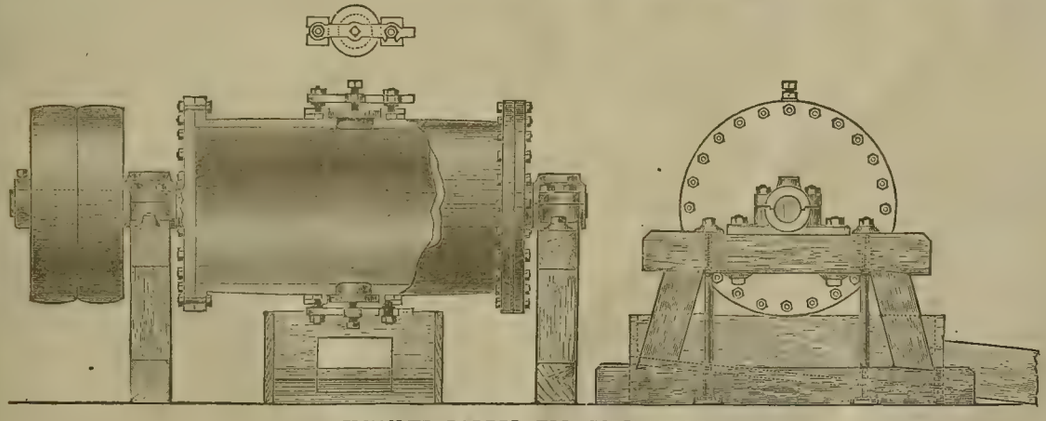


BATEA FOR CLEANING UP.

Clean-Up Barrel and Batea.

Illustrations on this page show the clean-up barrel and batea used in gold-mills. In cleaning up the mortars and boxes at the ends of sluices after a run, much valuable amalgam is found mixed with quartz, iron and other foreign matter. These cleanings, upon being placed in the clean-up barrel with additional quicksilver and cast-iron balls, are thoroughly ground and worked, the amalgam being taken up by the quicksilver and separated from the waste matter. The clean-up barrel, as illustrated, is of cast iron, having two openings, giving access to the inside. The journals are cast on the heads, one being extended so as to carry fast and loose pulleys for driving.

The batea is a cast-iron pan, supported at one end on a roller and suspended by rods at the other. An oscillating motion is imparted by means of crank on vertical shaft. In fact, it is a miner's pan on a large scale, and with it the waste matter can be quickly separated from large samples of ore. In mills it is used for saving amalgam often found mixed with quartz, etc., in cleaning up. In this respect it resembles the clean-up barrel, but is capable of closer work. Machines of the types illustrated are made in this city by the Fulton Iron Works.



CLEAN-UP BARREL FOR GOLD MILLS.

INCREASED FACILITIES.—The Judson Iron Works, on the bay shore, which employ 100 men, have decided to greatly enlarge their plant and increase their facilities for manufacturing their products. The works are already very extensive, covering several acres, and the importance to Oakland of the enterprise is considerable. A large addition of men will be made to the working force.

ON the 22d inst. there will be a total eclipse of the sun at 11:13 o'clock in the forenoon. It will not be visible in this country but will be in Mexico, the Caribbean Sea and the west coast of Africa, where vessels have been sent by several governments to take observations.

SOME miners working the Pot Hole claim, 12 miles from Yuma, have succeeded in pumping out the water and getting to bedrock. The gravel now yields from $2 to $5 to the pan.

The Silver Convention.

The Resolutions Adopted at St. Louis.

A great number of resolutions were introduced at the Silver Convention in St. Louis, all of which were reported to the proper committee. Among them the following, offered by Jacks of California, was received with cheers, and was referred under the rule:

WHEREAS, Wall street and Eastern bondholders are now actually at work striving to elect a Speaker for the approaching Congress whose record is entirely opposed to silver interests, whereas the representatives in Congress should be the servants of the people.

Whereas, This great convention shows a public opinion in the Western and Southern States and Territories in favor of more coinage of silver; therefore,

Resolved, That the Western and Southern Representatives in Congress be requested to support some friend of silver for the Speakership of the present House of Representatives, and that their failure to do so will be a betrayal of the people, warranting their political death.

Congressman R. P. Bland of Missouri addressed the convention. In the course of his speech he said: "The free coinage of silver will settle the silver question and greatly relieve the poor. The only question with metallists in our country is whether we should at once repeal our demonetization laws or wait for the convenience of the other powers, including Great Britain. It is a significant fact that you will scarcely find a man in public life to-day who will assume the responsibility of contending for a single gold standard. I am in favor of paddling our own canoe in this as well as all other subjects. If we have enacted bad laws, let us repeal them. Especially should we repeal a law that has been so universally condemned as the demonetization Act of 1873. No matter whether the interested few who engineered this legislation meant well or not, it was practically a fraud upon Congress and the American people."

Senator Stewart's Remarks.

Thomas Jordan of the N. Y. *Mining Record* read a paper on "The Silver Question," and papers were also read by Judge Morris of Richmond and Congressman Symes of Colorado. The latter was followed by Senator Stewart of Nevada. The Senator's address was an off-hand talk and seemed to suit the delegates better than the printed papers to which they had previously listened.

In the course of his remarks, Senator Stewart said: "Many nations have tried lead, iron and copper, but finally all civilized and semi-civilized nations have decided on silver. The use of silver is prehistoric. First we heard of the use of silver as money, while gold was first used as an ornament, and later as money. For 3000 years or more there have been metals out of which money could be manufactured. Now, I say, as long as a dollar can be manufactured out of a given quantity of silver or gold, it makes no difference to the owner what bullion he has. With either he can get a dollar, and with that dollar buy the same amount of labor or property. There is nothing like a scarcity of money. Poverty, inability to pay debts, inability to support a family, will make men cowards. The creation of the great middle classes of England was brought about by the discovery of gold in Mexico and South America. The fall in silver in Europe was the cause of the people having some money and becoming independent. The farmers of our country to-day, in consequence of the machinations of the money kings and gold mono-metallists, are losing the independence of character for which they have been noted. Their mortgages are making them cowards.'

"I will not stop to explain how this silver demonetization fraud was committed. There was no discussion in the Senate—not a word, not a suggestion in the Senate that the dollar was to be omitted. There is nothing in the record of the Senate to show how that dollar got out. The report of the Conference Committee doesn't show it, but we find the fact to be that silver was omitted, and I call upon the people to explain how it occurred.

"There are twenty-five thousand millions of the national debt we know of, and it is estimated that there is at least three times as much other debt, county, municipal, corporation, etc., making a hundred thousand millions in all. Two hundred millions of gold and silver was being manufactured a month. The people had a right to rely on that. Now this scheme has cut off one-half of that supply, and the debtor is bound by that contract."

Senator Stewart closed by urging that there be a plain demand upon Congress to remonetize silver. No dallying, no compromise, but a straight demand. "Meet the creditor," he said, "face to face, for if you must yield him your property, you might as well do it now as in the future."

Senator Jones.

A letter was read from Senator Jones of Nevada, in which he said: "I look upon the movement for the remonetization of silver as one of the most beneficent that can engage the attention of men. In the spirit of hope and aspiration which its success presages, I see a great force for the better and broader growth of our republic upon a basis of prosperity and intelligence at once natural and progressive. With a sufficient volume of money to meet the demands of its increasing population, our country will place itself in the vanguard of the nations for all time to come. No close observer of public sentiment in the United States can for a moment entertain a doubt that the great majority of the people are in favor of the full remonetization of silver. All that it is necessary for them to do in order to give effect to their desire is to make their voices heard by their Representatives in Congress."

The Resolution.

The following resolution, introduced by Mr. Newlands of Nevada, was referred to the Executive Committee, with full power, by a unanimous vote, and will form the basis for Congressional action before the Fifty-first Congress:

WHEREAS, It has been frequently stated, and the statement is apparently authentic, that the Act of Congress of 1873, entitled "An Act revising and amending the laws relative to the mints, assay offices and coinage of the United States," from which the silver dollar as one of the acknowledged coins of the Republic, existing in all previous laws, and for which free and unlimited coinage was provided in such laws, was eliminated and stricken out, and was considered by both houses of Congress without the real purpose of the bill being disclosed or discussed; and that, on the contrary, the debates of Congress show that the bill was discussed and considered upon the assumption that the Act contained and included the silver dollar as one of the existing coins of the United States, as evidenced by the debates of Congress, and by the subsequent declarations of distinguished men who participated in said act of legislation; whereas, it further appears that the said Act was signed by President Grant without the knowledge upon his part that the silver dollar had been stricken out as one of the coins entitled to coinage, which fact is evidenced by a letter written by him eight months after the signing of said bill to his friend Mr. Cowdrey, in which he said: "The panic has brought greenbacks about to a par with silver. I wonder that silver is not already coming into the market to supply the deficiency in the circulating medium. When it does come, and I predict that it will soon, we will have made a rapid stride toward specie payments. I confess to a desire to see a limited hoarding of the money. It insures a firm foundation in time of need, but I want to see the hoarding of something that has a standard value the world over. Silver has this. Our mines are now producing almost unlimited amounts of silver, and it is becoming a question, What shall we do with it? I suggest to put it in circulation now, keep it there until it is fixed, and then we will find other markets;" and, whereas, the effect of such legislation was, without calling the attention of Congress or the people thereto, to prevent the free coinage of silver and thereby to demonetize it as a legal tender for debts, thereby increasing the purchasing-power of gold, increasing the obligation of all debtors, and diminishing the value of all products and property other than money; and, whereas, such legislation, if the facts are correctly stated, constitutes the first instance in the history of legislation in this country in which the real purpose of the Act, fraught with so much injury to the best interests of the people, was withheld from deliberation and discussion; and the first instance which indirect and clandestine legislation affecting the great and important interests have been brought to the attention of the American people; now, therefore,

Resolved, That the Executive Committee be requested to inquire into the facts connected with the adoption and the signing of the said Act, and to make the same known to the people of the United States in such a manner as may be deemed advisable.

Mr. Newlands' Statement.

A motion was made by Francis G. Newlands in connection with this extraordinary statement and important proposition. Mr. Newlands said:

"It is not generally known that no special Act demonetizing silver or preventing its coinage was ever passed. From the early days of the Republic the silver dollar has been one of the standard coins mentioned in all the coinage Acts with other coins as entitled to free coinage and as a legal tender for debts. The Act of 1873 was entitled 'An Act to revise the mint laws and the laws relating to coinage.' The bill was discussed, it appears, in both the House and the Senate, without any reference whatever being made to the fact which was discovered after the Act was passed that the silver dollar was omitted as one of the coins of the country. On the contrary, the assumption throughout the debate was that the silver dollar was in the bill, and the Senate went so far as to pass an amendment providing for the inscription upon the silver dollar, which, when the Act was passed, proved to have no existence.

"The President signed the bill without knowing that the silver dollar was omitted. Eight months afterward he addressed a letter to a friend in which he speaks of silver as an acknowledged coin of the country, and refers to the great service that it would perform owing to the increased profits of the Comstock mines in the resumption of specie payments.

"All the men who participated in the consideration of the Act of 1873, with the one exception, when they have spoken at all on the subject, have publicly repudiated any knowledge that in it silver was demonetized or its coinage stopped. It is for the purpose of gathering all the information on this subject contained in the debates of Congress, the communication of President Grant and the subsequent declaration of prominent members of both houses that this committee was called upon to act, for if the people are convinced that the demonetization of silver was accomplished without debate and without the attention of Congress or the country being called to the fact, or was accomplished by stealth and clandestine legislation, the agitation in favor of restoring the silver dollar to its old place as money will be strengthened. After that is done, and not till then, should the monometallists present their arguments and let the matter go before the people for their verdict."

Mr. Newlands further intimated that the convention was a great success and its action would have an undoubted effect upon the farmers and industrial organizations and producing classes generally of the Mississippi and Ohio valleys, as well as the planters of the South. The great contraction of the currency caused, first, by the retirement of the greenbacks, and then by the demonetization of silver, had been felt through the country, save in some favored locality, in the fall of values; for it is axiomatic that if the volume of money is diminished in a country the values of all other property, and of labor, must also diminish; that the effect of the contraction of the currency is to increase the value of money and of all evidences of debt in the hands of the creditor class; to increase the obligations of the debtor class and to diminish the value of their products and their labor, with which they expect to pay their debts.

A General Committee.

Mr. Fitch amended his resolution so that instead of the convention selecting one delegate from each State and Territory and ten members at large, a general committee of one delegate from each State and Territory should be selected, and this general committee to select a committee of nine whose duty it shall be to call the next silver convention and generally keep alive the interest in the free-coinage movement.

This was agreed to and a Commissioner was named under it with James McCudden of California, W. J. Cheyner of Arizona, Charles F. Muesingbrod of Montana, Thomas Fitch of Nevada, Baldwin of New Mexico, W. F. James of Utah, and M. A. Grant of Wyoming among the Commissioners. Subsequently General M. Warner of Ohio was chosen Chairman.

Mr. Fitch's Speech.

A call was made for a speech by Mr. Fitch of Nevada, and he delivered the most notable one of the session.

"For 20 years we have had abundant prosperity, but at the end of it we find wealth centered in few hands. What has the laborer to show for 20 years of toil? He can boast that the aggregate wealth of the nation is largely increased, of factories established, cities erected, rivers bridged, transcontinental highways reaching from ocean to ocean. He can call the roll of millionaires and thousands will respond, where before the war there were less than 500. He can wipe sweat from his weary face and reflect that among the 8000 millionaires may be enumerated the names of 20 American citizens who have gathered $1,500,000,000 from the toil and tears of 60,000,000 people. He can walk weary and shelterless in the shadow of the palace he has built, but may not enter.

"I seek not to assail the rights of capitalists or arouse against them the prejudices of poverty or unthrift, but for 20 years capital has tampered with the people's money and gathered to itself illicit gains by increasing the burden of industry. The fight for the restoration of silver is a fight of the debtors against the creditors, laborer against capitalist, poor against rich.

"It is idle for monometallists to tell us prices have been reduced because of the increased production in India. This may be the approximate cause, but I say the cause will be found in the silver demonetization alone. England has become to-day the greatest silver consumer in the world, and yet in all her vast empire she produces less than seven per cent of the world's supply, and Germany, the co-conspirator in the work of demonetization, produces less than 3 per cent. England is the bunko-steerer of the world, and Uncle Sam is the gentleman from the rural districts. How much longer will our miners, planters and farmers consent that Senators and Representatives at Washington shall continue to legislate in the interest of Wall street? Is it not time for the American eagle to rise and shake the Liverpool salt from its tail? It may be the sudden remonetization of silver would produce some temporary disturbances in Wall street, but the eastern and western boundaries of this nation are not found between Pearl street and Broadway. We are here to represent the cottages and cabins of this country, and the interest should be protected though the bulls of Wall-street bucket-shops bellow with rage."

After the convention adjourned *sine die* a banquet was given to the delegates, at which many speeches were made.

The Lead Men in Convention.

Lead men who were barred out of the convention under the call held a meeting at the Southern hotel. California, Colorado, Montana, Utah, Idaho, New Mexico and Nevada were represented. James H. Blood of Colorado presided and W. G. Gallagher of Montana was secretary. The following preamble and resolution were unanimously adopted:

WHEREAS, The productions of ore and gold, silver, lead and copper constitutes the leading industries of the States and Territories of the Rocky mountain region and of the Pacific Coast; and, whereas, the results of such production are most important to the whole country; and whereas, in the interest of mine owners, miners, transporters, smelters, material-men and our mining interests generally, it is desirable that a thorough organization of all interest should be had on the principle that "in union there is strength;" therefore,

Resolved, That this convention earnestly recommends that in each of the mining States and Territories an association of all interested in said industries be formed, and that the associations so formed, by delegates duly authorized, form and organize a central association, all to the end that proper and full statistics may be collected for ready use, that ways and means be provided for the use of coming interest, and that our influence in favor of protection to our said industries may be consolidated and made potential.

It was agreed that these organizations should be pushed and a steady fight for lead be made, and an organization which Mr. Blood means to call to life in the near future.

El Dorado Quartz and Gravel Mines.

Had it not been for the settling up of California by agriculturists after the rich placer mines had begun to decline, it would not now be possible to work the remaining low-grade placer and quartz mines at a profit.

The rapid increase in population and agricultural productions stimulated the building of railroads, manufactories and other industries, which gave us cheaper transportation, thus lessening the cost of most of the necessaries of life to a great degree.

All will agree that on the Georgetown divide are immense bodies of auriferous gravel and low-grade quartz which are only waiting for capital and practical management to make them yield millions of gold both to the advantage of the operators and men employed, as well as to the community and county.

In the very fact of increased population, cheaper necessaries of life, and improved machinery and methods, is our abiding confidence that a revival of our mining industry is close at hand.

Already we see the headlights approaching slowly but surely up the divide. As mine after mine is made a success, undeveloped prospects will be opened up, and among them, no doubt, will be found valuable mines.

Visit the Taylor, the Kelley, Lone Jack, Big Sandy and other mines recently taken hold of by practical mine operators, and you will return imbued with renewed energy and confidence. You will see plainly that we have some equally promising prospects for milling propositions all along the line as far up as Volcanoville. These promising claims have been abiding their time for thorough development, just as many of the claims higher up are now doing.

Go visit the deep gravel mines on the Forest Hill divide and witness the grand results. Behold the millions of gold which is being taken from the deep and long-hidden deposits through tunneling and drifting, and the new tunnels being driven to tap gravel that promises even a greater output. Return to the promising deep gravel-beds of your own Volcanoville and vicinity, and more fully comprehend the possibilities in store for you. Like the prospectors on the other side of the river have done, you must also labor under many disadvantages and bide your time. But you have not much longer to wait.—*Georgetown Gazette.*

COMSTOCK MINES.—The Virginia City *Chronicle* gives the total value of the Comstock lode, according to Tuesday's quotations, at $5,945,000. The highest valuation was in January, 1875, when it was rated at nearly $500,000,000, and the lowest in July, 1884, when its valuation was placed at $2,900,000. At the time of the highest valuation there were only four bullion producing mines on the lode—the Con. Virginia, California, Crown Point and Belcher—while at present there are eleven; but the combined bullion product of these is less than one-fourth of that of the four mines mentioned above in 1875. At that date those were the only mines that possessed any actual value, that of the others being merely speculative. Union Consolidated, Mexican and other locations that had scarcely been disturbed by a pick, were quoted at $90, $95 and $120 a share.

THE CRYSTALLIZATION OF IRON. — Mr. Thomas Morris, F. G. S., of the Pearson & Knowles Company's works, Warrington, recently read a paper before the Liverpool Engineering Society on "Some Causes of the Crystallization of Iron." Mr. Morris, whose long experience in iron manufacture entitles his opinions to be received with respect, contends that the well-known brittleness frequently developed in iron is the result of excess of oxygen during the puddling process; overheating in the mill and axle forge furnaces; compression, as in the case of the inside of links of chains, hammering, cold rolled, etc., and not of vibration, which is, by many engineers and others, put down as the cause of crystallization. Mr. Morris' views were vigorously combated, and the discussion, though exceedingly technical, was varied and interesting.

THE WESTINGHOUSE ELECTRIC COMPANY has now an amount of orders on hand which represent a sum far above $1,000,000. They are occupied in constructing the machinery for 32 electric-light plants with a capacity of incandescent lights aggregating 31,150. In addition to that they have to make the machinery for the Allegheny City light plant, and they are also engaged in getting ready the machinery for the 50,000-light plant in London, England, as well as constructing machines which are to be used in the new electric shops now in progress of erection in London, England.

THE Mariposa *News* says: The sun does not rise on Mirror lake, Yosemite valley, until 11:30 o'clock in the morning.

Astronomical Photography.

(Concluded from last issue)

Part II: Stellar Photography.

Under this caption I will speak chiefly of what has been done by the astronomers' camera in the way of securing photographic images of the *stars;* of the wonderful *clusters* of suns, that seem like distant universes; and of the beautiful *nebulæ* which are scattered so richly over certain portions of the heavens.

This has only recently reached a truly successful stage; stellar photography may be considered an achievement of the last ten years, although experimentally it dates back to 1845, when William Cranch Bond (one of the first great American astronomers), at Harvard College Observatory, assisted by a photographer of Boston, named Whipple, took daguerreotypes of "Vega" and "Castor." The latter is a close double star, and even that early photograph showed "an elongation plainly due to the components." The work was very slowly advanced. Mr. Rutherfurd, with improved plates and using his 11½-inch photographic telescope, took photographs of stars down to the 9th magnitude (three "magnitudes" fainter than can be discerned by the unaided eye). In describing his success, the New York astronomer wrote:

"The power to obtain images of the 9th-magnitude stars with so moderate an aperture promises to develop and increase the application of photography to the mapping of the sidereal heavens, and in some manner to realize the hopes which have been so long deferred and disappointed.

"It would not be difficult to arrange a camera-box, capable of exposing a surface sufficient to obtain a map of two degrees square, and with instruments of large aperture we may hope to reach much smaller stars than I have yet taken. There is also every probability that the chemistry of photography will be very much improved, and more sensitive methods devised."

The astro-photographers have frequently recalled these words, and with reason. Mr. Common, in quoting them, remarked that in the light of recent events they seemed almost prophetic.

Stars and Nebulæ.

De La Rue, Huggins and Vogel in the Old World, Bond, Rutherfurd and Draper on this side the Atlantic, by a gradual process of experimental work, succeeded in obtaining photographic images of stars and nebulæ, and even of the spectra of these bodies. Their success increased as the plates improved; and to-day their worthy successors—for many of these honored names have passed into history—can exhibit photographs of the nebulæ which show every detail visible to the eye and bring out beautiful characteristics which the eye alone might never have discovered. In one of the Halls at the Lick Observatory the visitor notices on the wall, near the entrance to the Great Dome, an enlarged photograph several feet in diameter, which in answer to his question, the astronomer who is acting as guide will explain to be a picture of the "Great Nebula in Orion." I have seen many a foot pause on the steps leading to the large telescope, while the observer wondered at the curious photograph; and to those who understand its full meaning, the picture is marvelous indeed. It was obtained by Mr. Common of the Royal Astronomical Society, after a careful exposure of over an hour with his large reflector.

I dare say almost any one of my hearers is familiar with the beautiful constellation "Orion." It is not visible in the evening sky now, but will be before many months. Let me suggest to you, on some clear night (when no moon interferes) to hunt out the place of this nebula. You will easily recognize the "Belt"—depending from which in the legitimate manner are three fainter stars forming the "sword." Of these three stars, the southernmost is fairly bright, and the top one (nearest the "Belt") is rather difficult to see. The middle one appears as a blurred and ill-defined star of about the 5th magnitude. It is lettered *θ* [theta] on the maps and when viewed with the telescope is seen to be a multiple star (there are dozens of stars visible in a good glass) situated in a vast cloud, or "nebula" of self-luminous matter, which must be of such inconceivable extent that the entire diameter of our solar system—fifty-three hundred of million miles—would be a mere indistinguishable point in comparison.

A view of this beautiful nebula in a large telescope is something never to be forgotten; looked at as a picture only, it transcends any other like object in the sky. When we try to think of what it really signifies, the imagination is simply dismayed. Its appearance has been studied for centuries, but all attempts to detect any decided change in the structure of the nebula by comparison of drawings and descriptions have proved illusive. Years of ocular investigation, however, are excelled in fidelity by a single modern photograph, and while none of us may ever hear of the mystery being penetrated, a comparison of Mr. Common's photograph with one taken 40 or 50 years hence will definitely determine whether any changes are taking place, and perhaps reveal the true nature and signification of these most interesting bodies.

Another Remarkable Nebula.

And one which is visible this time of year, may be seen with the naked eye in the constellation "Andromeda," close to the star lettered *υ* [nu]. This has been most successfully photographed by Mr. Isaac Roberts, also of the Royal Astronomical Society, within the past year. With the photographic lens bought for the eclipse expedition, Mr. Barnard of the Lick Observatory has made a magnificent picture of this nebula. He has kindly allowed me a positive to show you this evening on the screen. You have doubtless heard that

Star Maps

Are now to be made by photography. This work was suggested by Rutherfurd in the "prophecy" which I have already quoted; it was first shown to be feasible by Professor David Gill, Her Majesty's Astronomer at the Cape of Good Hope, when he exhibited to the admiring members of the Royal Astronomical Society his photograph of the great Southern comet of 1882, which he obtained by an ordinary portrait lens with long exposure. This was not by any means the first comet photograph which had ever been made. After many previous experiments by others, Mr. Common had finally obtained a negative of "Comet b, 1881," a beautiful comet, still fresh in the memories of many of you, no doubt. And it was not so much the success of Mr. Gill's magnificent comet picture which awakened the astronomical workers to the importance of photographic methods, but the number and sharpness of the *star impressions* recorded on the plate. Throughout the tail, showing through that appendage apparently undimmed and scattered all over the plate with extraordinary distinctness, were hundreds of stars, from the brightest in that particular field of view down to the lesser magnitudes, entirely invisible to the naked eye. To many experienced photographers in the astronomical line, this picture came "as a revelation," as one of the foremost among them remarked. The importance of Dr. Gill's achievement was immediately perceived; it produced a revolution in at least one branch of observatory work, and on this hinges a curious bit of history.

That assiduous observer, Chacornac, many years ago, while Astronomer at the National Observatory at Paris, started in to make a complete set of

"Ecliptic Charts"

For use in discovering minor planets, etc. The Ecliptic, it need hardly be explained, is that path around the heavens in which the sun, moon and planets appear to describe their motions; and even the little planets or asteroids, with the most eccentric orbits, are bound to cross that line at some time during their revolutions. A minute chart of this region was then a great desideratum. A proof of its value is found in the list of discoveries made by Chacornac while executing the work. For a score of years the French Astronomer labored at his self-imposed task, and at his death early in the last decade, had finished but 36 out of the 72 Zodiacal charts projected. The brothers Henry (Paul and Prosper), of the same observatory, two most admirable men and devoted workers, attempted to finish Chacornac's undertaking. They succeeded in completing 10 of the remaining 36, but at this point reached that portion of the Ecliptic occupied by the Sun in mid-winter — in the Constellation "Sagittarius," where the Zodiac crosses the *Milky Way*.

I have a lantern slide (made by Mr. Barnard with the Willard Photographic lens) representing a region of the sky near this point.* When you have seen this you will appreciate the manifest hopelessness of the task undertaken by the Henry brothers. Thousands upon thousands of stars came into view with every sweep of the telescope; to enumerate these, even approximately, would have been an enormous task; to plot the position of each one accurately on the chart was a simple impossibility.

(Look into the sky some clear night—the heavens seem literally spangled with stars and the idea of counting them seems preposterous. Yet there are hardly more than 2000 visible at any one time to the naked eye, numerous as they seem. In the whole sphere there are less than 7000 naked-eye stars. With the slightest optical assistance the number is enormously increased. A spy-glass shows over 100,000. A common street telescope brings out half a million, and, as Prof. Young of Princeton says: "The number visible in the great Lick Telescope of three feet diameter is probably nearly 100,000,000." Again, you must remember that the stars are not at all uniformly distributed throughout the sky—in some places the field of the telescope is nearly barren of stars; in others, around the great circle of the *Milky Way*, the number visible is almost unlimited.) In this emergency

The Henry Brothers

Heard of Dr. Gill's photograph showing the multitude of stars, and in it discovered the solution of the difficulty. They would turn their telescope into a camera, and let the stars map themselves!

I cannot commence to tell you of the grand work the Henrys have accomplished. They use a twin telescope, consisting of a 13-inch photographic and a 9-inch usual glass, mounted as a single equatorial.

I will show you a view of this unique instrument (kindly prepared for me by Professor Burnham), and will speak more in description when we have it on the screen. You will remember that in the beginning of this lecture I spoke of the Paris Congress, which met in 1887, and of the work it proposed (among other things) to accomplish. The telescopes to be used by the different observatories co-operating are of this type. The ten or eleven thousand photographic charts estimated as necessary to cover the entire sky will probably be completed in five or six years. The star-chart congress will assemble again, the coming month, at Paris; and it will be supplemented by a general meeting of astronomical photographers, for the discussion and co-ordination of work in this grand field. The whole subject is so comparatively new that we may confidently expect even greater advances in the future. As it is, since the plan of operations (with a 13-inch telescope of 15-feet focal length) was adopted by the congress, a new scheme, involving a complete set of charts by a single telescope (a photographic doublet of 24 inches aperture) has been set on foot by Professor Pickering, the director of the Harvard College Observatory, the funds being provided by a wealthy New York lady, Miss Bruce.

This Projected Camera

Having a focal length of only 11 feet, will give plates each covering an area in the sky equal to five degrees square. With such a camera on a high mountain in the southern part of California, favored by our clear, transparent skies, Prof. Pickering expects to complete the entire series of charts, alone, in two or three seasons.

The very mention of the Harvard College Observatory brings with it a host of suggestions, most of which I must ignore in this address, for I fear I have already taxed your patience with too lengthy a presentation of a subject which really requires a volume by itself. I will only refer to a branch of the photographic work of which the Harvard astronomers have made a specialty—spectrum photography. A prism in front of the telescope is used to disperse the light of the stars in view before passing through the object-glass—each star shown then gives a spectral image instead of a point. Any of this audience who may have attended Professor Keeler's lecture on the "spectroscope" last year, will appreciate the special advantages of this study. The spectrum of every star in a cluster like the Pleiades may be photographed on a single plate and individual peculiarities studied. A distant unknown planet would possibly be recognized by the difference in its spectrum, since a star shines by its own light, and each planet in our system simply reflects the light of the sun. Any major planet in our system still unknown, would doubtless be of exceeding faintness—probably smaller than the 10th magnitude—its motion among the stars would be remarkably slow and difficult to detect; and if such a planet really exists, it may, in the course of years, be discovered by means of photography.

If I could place before you for comparison one of the very best optically constructed charts of the solar spectrum (say Kirchoff's), and also a copy of Professor Rowland's

Great Photographic Map,

A single glance would show you the wonderful superiority of the latter. Where dozens of "lines" are given on the chart, hundreds may be seen in the photograph, which extends very nearly as far in the *red* end of the spectrum, and far beyond it in the "*ultra-violet*"—that curious extension of the visual spectrum which would now be unknown to us but for these same photographic methods. And every "line" shown gives us a clue to the constitution of our sun, and adds an item of evidence to that long chain which will one day reveal the ultimate chemical conditions of matter.

In conclusion, I must explain one allusion which I have made, namely, the power of the photographic plate to exhibit stars which are invisible to the eye when using the same telescopic assistance. This seeming paradox is the result of the continually increasing "sensitiveness" of the gelatine plate as compared with the rapidly wearied human eye. The eye of the observer will not acknowledge the impression of a distant star, the rays of light from which are so exceedingly faint as not to produce any effect on the optic nerve in less than 1-10th of a second; the effect of these rays on the eye is not "cumulative." But when the photographic plate is exposed to the same rays for a number of hours, the effect of them is (as it were) "piled up;" images of the *bright* stars become larger and larger as the exposure is continued, and at the same time the number of the "*invisible*" stars collected on the plate is continually increased.

The little cluster now visible in the east of an evening, and known as the "Pleiades," is perfectly familiar to every casual observer of the heavens; a person of ordinary sight has no trouble in distinguishing six or seven in the group—a good eye can detect 11 or 12.

The French astronomer Wolf spent three years in making an accurate map of this cluster, as seen in the large Paris telescope, and at the end of that time had recorded 671 stars. A photograph taken in one night by the famous Henry brothers added over 800 stars to this number. And this is in a region of the sky which is not at all "rich" with stars. In a portion of the *Milky Way*, represented in one of the pictures I shall exhibit to-night, and containing about 8000 stars, only 14 are visible to the naked eye. So much for the *magnitude* of these photographic operations; as for the *accuracy*, it need only be remarked that a recent discussion by Dr. W. L. Elkin of Yale College has shown that careful measurements from a good photographic plate are even more reliable than those made with the best micrometers used with the telescope.

There is one drawback which should be mentioned—photographic maps are not a good guide to the real brightness of the stars. Any lady in my audience knows that she would not go to a photographer's in a red dress unless she wished to appear in the picture as if attired in a most somber manner. Nor would she decorate her little girl with a blue sash over a light dress, for there would then be no contrast shown in the negative. In other words, the photographic plates now used are insensible to those colors in the red and orange portions of the spectrum, but are especially acted upon by the blue and violet rays. For this reason a brilliant first magnitude *red* star, such as "Aldebaran" in Taurus, or "Antares," in the Scorpion, would appear no larger on the photograph than a good *bluish-white* star of the third or fourth magnitude. This matter of photographic magnitudes is now the subject of considerable investigation; it is an important one, but these differences do not appreciably lessen the value of the photographic plate as a star map.

And, finally, you must not imagine that these rapid and accurate photographic charts will do away with the usefulness of that great standard authority for star positions—that most important instrument of the old astronomy — the Meridian Circle. This detailed mapping of the heavens must proceed on exactly the same lines as those laid out for the minute survey of this great continent; just as the different elaborate State surveys, which give the mutual relation of every little landmark in each territory, depend, for their co-ordination into one complete map, upon the latitudes and longitudes of several important "stations" determined by our National Coast and Geodetic Survey, so will each photographic star map obtained by the new methods demand many well-determined reference points for its accurate reduction, and all these points must be obtained by observations with the Meridian instruments. The "Old" and the "New" Astronomy, as one of our greatest scientists has called them, are not rivals, but are mutually dependent, and Photography has become at once the Disciple of the one and the Apostle of the other.

*The original plate (5x10) from which this slide was made was exposed to the sky for 3h. 15m. During every second of this time the eye of the observer kept the camera exactly pointed. The plate shows over 15,000 stars.

NOTE.—Blackboard explanations were introduced by the speaker at several points of the lecture, and at its close a number of lantern slides made at the Lick Observatory, were, through the courtesy of Professor Holden, Director, exhibited by means of Professor Thoburn's lantern, kindly loaned by him, and manipulated by Mr. Swickard, a student at the University of the Pacific.

The Mining Industry.

Henry B. Clifford says, in the New York *Tribune:* Despite its load of fraudulent claims and wildcat schemes, the mining industry has paid more money in dividends, compared with other industries started in the last 30 years, than any business known. Compare the profits in mining with the profits on the total liabilities of the 156,000 miles of railroad with the aggregate liabilities of nearly $10,000,000,000. Then you will see what pays the most. Under the wing of mining there exists some of the safest and most profitable of all business. Take, for instance, the 12 great smelting companies, the mineral pawnbrokers. The smelting companies that do a strictly custom business show absolutely and unquestionably the largest profits of any industry in America. I know of instances where capital invested in smelting companies has been turned five times a year and each time the margin of profit has been over 20 per cent of the entire amount handled. They take no risk; simply buy the raw gold and silver in the ore at a reduced price, extract their cost of treatment and pay the miner the residue. It is a business where the principal is absolutely safe. All of these things should show the people the value of mining. Of late it has come about that if a mining man presents an enterprise to conservative capital he is looked upon with suspicion and no assistance is rendered him. The investor fails to realize that the very sinews of commerce come from the mines, and they are the root of half the successful industries of this country. In 1888, notwithstanding the fact that capital gave very little assistance to the mining industry, there was a steady, healthy increase of prosperity. Of the $87,000,000 produced from the mines in 1888, the amount was divided so that all avenues of industry profited. Over 10 per cent went to railroad corporations, 37 per cent to mine-owners, fully 15 per cent to smelting works, while the residue, 38 per cent, was circulated among the laboring elements. It is a great mistake to invest in mining property that has no basis of valuation other than a prospective hole, large paper capitalization, a few assays, a glittering prospectus and the word of some man that the ground can readily be developed into a bonanza.

A MINING SUIT.—A dispatch from Denver, Colorado, says: The famous Durant-Bonnybel case, which has been on trial in the United States District Courts for the past 16 days, came to an end at 10 o'clock to-night, giving to Bonnybel a verdict for the second time. The case is famous among mining men throughout the country, for the reason that millions of money depended upon the verdict. Reports from Aspen are to the effect that the city is wild over the verdict, and in Denver the wine is flowing like water at all the hotels.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

NEW LONDON MILL.—*Dispatch*, Nov. 30: The building of the New London mill keeps up a ripple of excitement in the minds of many who are hopefully expecting to hear of some rich cleanings up when they get to running. This will be a benefit to all the surrounding country. Work on the above-mentioned mill is progressing rapidly while the good weather lasts, and Mr. Rees has got the mine in good shape to deliver 100 tons of rock per day, or as much more as may be wanted. There is a rumor that the Cosmopolitan mill will be ready to start up in another week, but it will probably take them a little longer to get ready. If this mill makes as good a showing as I think the New London will, it will only be a question of a very short time when all the intermediate country between Plymouth and Dry Creek will be worked.

PLYMOUTH CONSOLIDATED. — Amador *Ledger*, Nov. 30: Matters are moving along at the same slow pace at this once prosperous mine. Mr. Van Norden, the president of the company, was in Plymouth a few days back. Intimations were then made that the mine was to be worked in something like its old-time vigor, but whether under the present or a new company was not then known. Three or four extra men were employed, and a report circulated that a dozen more would be put to work. This, however, has not been realized. The explanation of the protracted idleness is laughed at in Plymouth. We notice it has since been published in the New York papers that the lower levels, said to have been so badly damaged by fire and water, are in condition to be worked again. We certainly think that continued inactivity calls for an official investigation in behalf of stockholders outside of the board of directors. The management has been and still is the subject of severe criticism by the small holders of stock, and it is due to all concerned to determine from disinterested sources whether there are adequate grounds for the dissatisfaction.

NEW LONDON.—The entire mill is expected to be under cover this week, so that the workmen will be able to push the work to completion hereafter regardless of the weather.

COSMOPOLITAN.—This mill is expected to be in running order in two weeks, and will be started as soon as finished. All who have inspected the underground workings speak in glowing terms of the large ore bodies exposed, and are sanguine of the property taking its rank among the dividend-paying mines.

NORTH GOVER.—Work was started on the North Gover on Tuesday last. It is proposed to sink the present shaft, which is 180 feet deep, to a depth of 500 feet before commencing to drift. The shaft is considerably caved, and the first work will be to repair it, and re-timber if necessary.

Calaveras.

COMMENCED OPERATIONS. — San Andreas *Prospect*, Nov. 30: The Benson Bros. started up their three-stamp mill at their gravel claim on Central hill this week. Albert Fletcher has been employed to attend the mill.

THE JACKSON CLAIM is being worked in earnest by the new company and we may soon expect to hear of some good returns from this mine.

Colusa.

BLACK DIAMONDS.—Colusa *Sun*, Nov. 30: D. P. Mulford, while out deer hunting a few days since, discovered in the vicinity of his ranch near Elk Creek a ten-inch vein of fine quality of bituminous coal. Mr. Mulford brought in a fine specimen. May this find turn out to be something more than a mere prospect.

El Dorado.

LONE JACK.—Georgetown *Gazette*, Nov. 30: H. Lawrence, Supt. of the Lone Jack mine, has bonded the Grover brothers' mine, an extension of the Slate Mountain mine, and also the California Jack mine south of Georgetown. The Lone Jack is operated by a S. F. company.

THE GOLDEN STATE quartz mine at Jones Hill has been leased from Barklage & Co. by Mrs. T. Z. Armstrong, Mat. Berschens and John Buchler, who began work last week.

Inyo.

PRESENT CONDITION OF PANAMINT.—Cor. Inyo *Index*, Nov. 30: The Surprise M. & M. Co., who are now operating here, own some 13 patented mines. The Hemlock, Stewart's Wonder, Hudson River and the others have all been opened sufficiently to demonstrate their permanency. Last winter three chloriders extracted from the Hemlock mine a quantity of ore. Ten tons of the first class, which was shipped and reduced, netted over $1500, and about 15 tons worked here produced over 3400 ounces of crude bullion. In consequence of the high cost of packing, milling, etc., nothing but the choicest ore was handled. In obtaining this ore large bodies of from 40 to 60-ounce silver quartz were left behind as valueless matter. The mineral belt wherein the mines lie is between three and four miles wide, running north and south, being easily traced 50 or 60 miles. At those points where the mineral crops out most prominently, and where the greatest natural advantages exist, mining camps have been established, such as Goler Canyon, Gold Hill, Panamint and Wild Rose, as bases for prospecting. A great porphyry dyke trends for miles toward the north and south. A ledge of galena and carbonate lead ores carrying gold and silver can easily be traced for miles. At a point about three miles south of Panamint it has been claimed by J. Curran and prospected to the depth of 130 feet. Three miles north on the same vein, about 1½ miles southeast of Panamint, the ledge has a tunnel run in the mountains following the croppings. At its mouth the croppings show about six inches of galena and carbonate lead ore; 50 or 60 feet in and at the face the vein shows two to three feet of high-grade ore, having a continuous body as far as opened. There has been considerable ore taken from the mine and shipped as back freight whenever opportunity has offered. Some 200 feet to the south a shaft has been sunk upon the croppings about 80 feet, and a few fine specimens of native gold were obtained while sinking the same. The vein here, like the Recluse owned by J. Curran has its ores free from the walls and carries plastic clay and porphyry ledge matter. The mine is called the Indus, after a rich locality in the East Indies, and has every appearance of honoring its name in the near future. The ore as taken from the ledge contains about 35 per cent lead, 40 ounces silver and $6 gold, being in black lime with two good walls easily traced, and having every appearance of a permanent vein. To the west of the lead belt lie the patented mines and mines owned and worked by private parties, which have in the past produced thousands of tons of ore and are as yet not much more than opened. The Blue Wing, Silver Rib and Magnet are owned by Russell & Mee. The last-named has contributed a large amount of silver ore. It is now being worked by Russell & Lemvigne, who are running a tunnel for deeper working. At the Oroville long tunnels have been run, deep shafts sunk, several fine bodies of ore exposed, and everything is in neat shape. The mine is owned by Mr. H. G. Chickering. The Sabine, a large, well-defined ledge owned by Chas. Anthony, shows considerable of a vein, averaging about 40 ounces per ton in silver. The Fremont and group, owned by James E. Wall, contain high-grade ores. Mr. Wall is about making arrangements to put them in working shape next spring. The Pontiac, with its large bodies of 40 to 50-ounce silver ore, now owned by J. Curran, lies idle, as the cost of packing, milling and other expenses leave no margin for profit. The Good Enough, Last Chance and others, owned by R. B. Flynn, make a good showing of high-grade ores. The Henry Clay group, owned by Peter Gallagher, have been sufficiently prospected to demonstrate their value. At the Jacob's Wonder long tunnels have been run, deep shafts sunk and a large amount of work performed, exposing a fine ledge. Mr. Daley's Antrim group, with drifts and shafts, have been prospected enough to show the value of the mines. There being so many fine-looking and valuable properties, only a portion of the most promising have been noticed. Every natural advantage exists for the economical working of the mines in this section. Fuel and timber are abundant and cheap. Water in sufficient quantity is convenient; but as an offset, high transportation, want of cheap milling facilities, lack of capital and other drawbacks exist, keeping the district in the background. At the present cost of transportation, silver ores containing 100 ounces return about $11 per ton after paying for team freight, railroad and reduction charges, leaving the miner only that amount for his labor and incidental expenses. The depreciation of silver has been another serious matter which the mines have had to contend with. At the present time reduction works capable of treating ores containing from 40 to 60 ounces of silver at such cost as to allow the mine-owner fair compensation for extraction, are badly needed.

Nevada.

COE MINE.—Grass Valley *Union*, Nov. 26: The Coe mine is now being worked on the tribute plan, and very good ore is being taken out at the 136-foot level east of the shaft. The bond on the mine expires on the 1st of January, when, if its conditions are not filled, the company will work the mine on its own account.

GOOD ORE AT THE PITTSBURG.—*Transcript*, Dec. 1: A foot ledge of fine-looking quality has been struck in the 900 level north of the Pittsburg mine. The station for the 1000-foot level is now being cut. Supt. Stokes is pushing the work ahead with activity.

THE HARTERY BONANZA.—Grass Valley *Union*, Nov. 27: The gold-bearing shoot of ore in the Hartery mine continues to grow in richness as the vein is exposed, and the specimens taken out in the last 48 hours are of greater value than any previously reported. This strike is on the second level below the drain tunnel, and as the ledge has been stripped the rich pay streak has become more clearly defined. The ledge is now five feet between walls, all of high-grade milling rock, while a 2-inch streak of it on the foot-wall is loaded with gold so heavy, indeed, that it appears to be more gold than quartz, the gold being coarse and of high quality. How far it will extend it is not possible to state, but up to this time there are no signs of its giving out, and it is found going down below the floor of the level. This ore is too rich to be worked by the ordinary mill process, and is being saved to be manipulated with greater care. From present appearances the shoot is likely to be extensive and rich even if its specimen character is not maintained, as the ore is showing well in galena, an evidence of reliability in the ore shoots of this district. With this find the prospects of the Hartery are very encouraging. The strike is the richest that has been made in the district in a long time.

Placer.

RED POINT.—Placer *Republican*, Nov. 27: The last four months at the Red Point mine have been occupied on the new branch tunnel which is now completed. It is 1100 feet long. The first upraise was made 811 feet from the main tunnel, and breasting was begun on the 12th inst. The work is directed up stream from the point where operations were stopped when the branch tunnel was begun, and the gravel ought to be good, as it was very rich when breasting was temporarily suspended four months ago. It is expected to yield something over $3 a carload at least. Preparations are being made to take out 200 carloads a day, which will employ about 70 miners.

IOWA HILL AND VICINITY.—Cor. *Argus*, Nov. 30: The outlook for our divide is encouraging. The recent heavy rains have given confidence to miners and ditch-men, who are making preparations to open up new claims and push old tunnels and shafts to completion. The Hogsback Co., whose ground is located above Indian Springs, have commenced work on a new and lower tunnel, and will push work on it all winter. A shaft sunk from their present tunnel struck gravel which gave a good prospect in gold—sufficient to warrant the company in driving a lower tunnel to strike the rich pay gravel in the old river channel now known to run through their ground and adjoining claims. The well-known richness of the gravel in the Red Point, or French company's mines, and others on the upper divide, is attracting the attention of other syndicates of capitalists to this section of Placer county. I learn from reliable sources that the agents of another French corporation are on their way to California, if not already here, whose reputed intention is to secure all they can of the valuable mining land on the Iowa Hill and Forest Hill divides. Ross E. Browne, the mining engineer, has been at work around this town surveying, taking the levels of the rim rock and the workings of our drift mines. A few more energetic men like Hoffmann, Hobson and Ralston, with foreign or Eastern capital to expend in developing our mines, would be welcome here. If the same good judgment is used, their reward would be as rich as that of the above well-known gentlemen. Although we have many acres of good hydraulic ground in this section, no mining by that process will be done here this season. The owners of hydraulic ground will not go to the great expense of fitting up claims while fears of injunctions haunt them. The Horman mine at Wisconsin Hill started up its mill last week, and are crushing the usual amount of pay gravel. About 20 men are employed at the mine. The owners have bought the water ditch at Wisconsin Hill from "China Tom," and intend running their mill by water-power. David McGetchen was in town last week from the Drummond quartz mine at Cottage Home, and reports the mill running steadily on good ore. About 25 men are at work, and expect to be employed all winter. The bedrock tunnel at the Morning Star gravel mine is being pushed ahead, consequently not enough gravel is being taken out to keep the mill running all the time. Rich results are expected as soon as the bedrock tunnel is completed.

Plumas.

INDIAN VALLEY MILL STARTED.—Greenville *Bulletin*, Nov. 26: On Monday, the Indian Valley mill started. The shaft has been pumped out, and sinking is to begin. Besides this, the mine has been opened up largely by the Union tunnel being driven into the mountain. Mr. Prentiss, the superintendent, has worked very energetically and deserves success. There is every indication of a good water season, a large supply already being in the Round Valley reservoir.

NEAR PRATTVILLE.—Cor. Lassen *Advocate*, Nov. 27: I am now on the North Fork of the Feather river, about six miles from Prattville, and am looking at some claims that look fine, and I think that this camp offers great inducements for capital. I find that there is here an ancient channel, that is rich in placer gold. The above channel you can follow for miles. There are three miles of it on the west side of the river, unbroken, which has been prospected with very satisfactory results. It follows across the river on the east side a distance unknown. I also find that the above channel is the main inlet to the whole country, and is covered with lava 450 feet deep. Plenty of ground can be had at reasonable figures, with clear title, and I look for a great camp here when capital becomes interested in the mines.

Shasta.

CRŒSUS.—Shasta County *Democrat*, Nov. 27: George Bassett came down Sunday from the Crœsus mine. He says the mining outlook in that camp is most propitious. The old Snyder mine is turning out to be a veritable bonanza, after all its ups and downs. Mr. Barron, the superintendent, has exposed 70 feet of a rich pay chute. This was found by crosscutting south from the main tunnel. The strike turns out to be a parallel vein with the one on which all the previous development work had been done.

FLAT CREEK.—About ten days ago Lem Walters and Ike Parker struck a four-foot ledge on the Flat creek side of the ridge south of Bull's Bar. The rock prospects $30 to the ton. This discovery is said to be the richest yet made in the Flat creek district.

Siskiyou.

THE SUNDAY MORNING MINE.—Cor. Yreka *Union*, Nov. 30: For the past 18 years rich pieces of float quartz have been picked up at various times by different parties on the north slope of Tanner's peak, with efforts made to discover the ledge from which it came, without success until after the arrival here of two prospectors, Messrs. Probasco and Stent, who after hearing the stories told by the old-timers concerning the float rock, proceeded at once to the locality with Harry Welker, who had previously found specimens. They began work in earnest to unearth the hidden treasure, which required but a few days' work with pick and shovel to expose to view the treasure vault from which came the precious float in the form of a well-defined fissure vein, showing a width of from one to three feet, between walls of porphyry and slate and speckled with the yellow stuff. The ledge has been crosscut at several places along on the surface, showing a continuous vein of quartz. A tunnel is being run into the mountain-side on the vein, and a winze is being sunk.

Tuolumne.

POCKET MINE.—*Union Democrat*, Nov. 30: It is stated on good authority that the pocket mine of Gale & Wickham, near Tuttletown, in this county, is showing splendidly. It is turning out coarse, massive gold in large quantity. The result in the past few days goes into the tens of thousands. The old Tuolumne pocket mines are "in Bonanza" sure. Its regular vein mines are also telling well under energetic, intelligent and economical management.

DRY TO WET.—Sonora *Independent*, Nov. 30: It is generally understood that the Golden Gate mill is to be changed from a dry crushing to a wet crushing mill, with concentrators, etc., and electric lighting machinery is now being put in to be used for lighting the mill, hoisting works and the stations of the shaft.

THE BLACK OAK MINE shut down last Monday, the men refusing to work any longer without money, as all hands are over two months without having received their pay, except in due-bills, of which the men have now plenty, as they are not in demand.

NOTES.—The Alameda mine is said to be in Bonanza, and the prospects there are very flattering. Frank McCann and some of his friends are to commence active operations on the Little Belle mine in a few days. The Mandrich Bros. have come upon a fine prospect in their old claim at Brown's Flat, and expect soon to take out a nice pocket. Hank Gale and James Wickham are still working to empty their rich pocket at Jackass Hill. They are taking out gold by the pound. Tuolumne's hills are full of it.

NEVADA.

Washoe District.

UTAH.—Virginia *Chronicle*, Nov. 30: On the 600 level the southeast drift is advanced 380 feet from the shaft station. Formation porphyry and clay.

OCCIDENTAL CON.—During the week extracted and milled 240 tons of ore showing an average assay value of $17 per ton. Repairs to the ore chutes caused a curtailment in the ore output below the usual average. The mill will be running to its full crushing capacity tomorrow.

NORTH OCCIDENTAL.—Extracting ore from the 300 and 400 levels.

HENDRICKS.—The steam hoist plant is now in first-class condition and repairs to the shaft collar in progress. When completed, explorations on various levels will begin.

SIERRA NEVADA.—On the 520 level at a point in the south drift from the east drift, 275 feet from the main east drift, a drift is advanced 100 feet, the face in porphyry and clay.

UNION CON.—On the 1465 level in the north lateral drift 50 feet south of the north line of the mine, west crosscut No. 3 is advanced 83 feet, and is in porphyry carrying strips of clay.

MEXICAN.—On the 1465 level from the north drift from west crosscut No. 1, 50 feet in from the lateral drift face, a west crosscut is advanced 159 feet, continuing in porphyry, clay and quartz.

OPHIR.—On the 1300 level from the end of the east crosscut from the shaft station a south drift is advanced 62 feet. Formation porphyry and quartz.

CON. CALIFORNIA & VIRGINIA. — From the stopes on the 1300, 1435, 1500, 1600, and 1650 levels continue to extract ore sufficient to supply the Morgan and Eureka mills. During the week 1154 tons and 230 pounds of ore were shipped to the Morgan mill, 1758 tons and 350 pounds to the Eureka mill. The average assay value of all the ore worked at these mills during the week, according to battery samples, was $26.25.

SAVAGE.—Shipped 480 tons of ore, battery sample assays showing the usual average value.

GOULD & CURRY.—On the 400 level in the main south drift, 80 feet west of south crosscut No. 1, west crosscut No. 2 is advanced 30 feet. Formation quartz showing some value.

BEST AND BELCHER.—On the 625 level, the raise is carried up 50 feet. At the above hight a small station has been cut out and west crosscut No. 1 advanced 10 feet. Formation clay and porphyry with streaks of quartz.

HALE AND NORCROSS.—Shipped to the Nevada mill during the week 1015 tons of ore, showing an average value of above $30 per ton by pulp assays.

CHOLLAR.—Crushed 400 tons of ore during the week. The 500 level northwest drift continues in low-grade quartz.

POTOSI.—The 800 level drift is still stripping low-grade quartz.

NORTH GOULD AND CURRY AND EAST BEST AND BELCHER.—The west drift from the northwest drift is cutting occasional bunches of quartz.

IMPERIAL.—The joint Confidence-Challenge 500 level east crosscut from the north drift continues in clay. The joint west crosscut continues in quartz and porphyry. The joint 800 level north drift is still in clay.

YELLOW JACKET.—Daily ore shipments have been increased to 80 tons, battery samples showing an average assay value of $21.50 per ton.

ALPHA.—Started drifting from the 600 level shaft station. The 500 level west crosscut is in quartz and clay.

EXCHEQUER.—The 382 level east crosscut has entered vein matter and the 500 level north line west crosscut continues in quartz.

OVERMAN.—Shipped 327 tons of ore to the Vivian mill during the week.

NEW YORK CON.—The raise above the 800 level west crosscut is showing fair-grade quartz.

CROWN POINT.—Shipped to the Mexican mill 549 tons of ore, showing a value of $17.95 per ton by pulp assays.

BELCHER.—Nos. 2 and 3 east crosscuts on the 1200 level continue in low-grade quartz. The 1000 level south drift is still showing quartz. The 850 level south drift is in porphyry.

SEG. BELCHER.—The 1200 west crosscut 20 feet north of the line is in 84 feet, and continues in porphyry and clay.

ALTA.—Crushed 339 tons of ore showing an average pulp assay value of $29.75 per ton.

JUSTICE.—Crushed 229 tons of ore showing an assay value of about $20 per ton from pulp samples.

Eureka District.

BY RAILROAD.—*Sentinel*, Nov. 30: During November the following products from this district were transported over the Eureka & Palisade R. R.: Seven hundred and eighty tons of ore for Salt Lake; 270,000 pounds of Richmond crude bullion, 340,000 pounds Richmond market lead, and 105,000 pounds of Eureka Con. market lead.

Osceola District.

A DITCH.—Virginia *Chronicle*, Nov. 29: A force of about 400 men is employed in excavating a ditch to bring the water of Lehman creek into Osceola district, White Pine county, for the purpose of working the placer mines there by the hydraulic process.

Pioche District.

FURNACE.—*Record*, Nov. 23: Since starting a week ago yesterday the furnace has run steadily and without a hitch so far as its operation is concerned. Up to yesterday 500 bars had been run out, making two carloads, one of which was shipped. Under the supervision of Mr. August Werner there is no question about the base ore of the camp being successfully reduced. The whole reduction works are near completion.

BLACK LEDGE WINZE.—The water in this winze is now down a depth of 135 feet. Yesterday an auxiliary pump was put in at the 13th station to relieve the smaller one farther down the shaft. The new pump will raise to the 12th all the water pumped from below and that which may drain from the ledge above. This will materially assist the work below and progress will now be easier and more rapid.

Tuscarora District.

BELLE ISLE. — *Times-Review*, Nov. 29: West crosscut, 350-foot level, extended seven feet, showing faces of ore.

NAVAJO.—The west stope on the 150-foot level continues to look well. Mill is running on custom ore.

NEVADA QUEEN.—South intermediate drift from 150-foot level of Commonwealth has been extended 18 feet, and is showing some good ore.

COMMONWEALTH. — 100-foot level: No. 2 east crosscut, near the face of north drift, has been extended 20 feet; face is all in vein. No. 1 east crosscut has advanced 20 feet; total, 132 feet. North

drift to connect with No. 2 east crosscut, advanced 23 feet, will break through today. This will give good ventilation to all the openings north of the shaft. No. 1 west crosscut extended 15 feet; the ore in the face is improved in quality.

GRAND ISLE.—North crosscut on the 500 foot level has been extended 10 feet through a hard but favorable formation.

NORTH BELLE ISLE. — The sump has been sunk 15 feet below the 600-foot level station.

NORTH COMMONWEALTH. — East crosscut, 225-foot level, extended 10 feet. South drift from same crosscut extended 15 feet. At a point 105 feet south of the joint crosscut have started to crosscut the vein, which looks well.

DEL MONTE.—Crosscut No. 2, 100-foot level, extended 14 feet, total length 110 feet. The face continues to show high-grade ore.

ARIZONA.

CONCENTRATING PLANTS.—*Arizona Miner* Nov. 27: Concentrating plants are the great need of our mining camps. The Congress mill is being run on full time day and night now, turning out seven tons of rich concentrates per day. The Tiger is looming up once more as a silver-producer, and promises to return to its old-time position in the ranks of dividend-paying properties of this county. C. K. W. McNary continues to work on his cinnabar ledge in Copper basin, and is securing good ore from it. Messrs. Jos. Mayer, Geo. McCann and Henry Stoddard have struck very rich ore in the north extension of the Boggs mine, while doing their assessment work on that property. The Ryland M. Co. has advanced wages from $3 to $3.50 per day, without any solicitation from miners. The latter figure is the prevailing price at present in this section of Arizona. Richard DeKuhn yesterday bought a pack train of 20 animals for the Mockingbird mine. The papers in connection with the sale of the Senator mine were signed and the money paid yesterday, closing the transaction and transferring the title to that property to Phelps, Dodge & Co. of New York.

CUPEL.—Mohave *Miner*, Nov. 30: The recent strike in the Cupel mine, Stockton Hill, in the crosscut winze on the 200-foot level proves to be a permanent find. There is seven inches of high-grade ore. The winze is being sunk on the extreme end of the ore body, consequently nothing can be ascertained as to the size until sinking and drifting has advanced.

OLD DOMINION COPPER CO.—*Silver Bell*, Nov. 27: We had the pleasure of inspecting the mine and smelting works on Tuesday last, and noted many improvements made since our last visit in June, and although upward of 8000 tons of ore have been extracted in the interval, no diminution in the supply in sight in the several levels is apparent. In the main stopes of the sixth level the face of the ore body is about 50 feet in width with five sets of vertical timbers, from which may be gained an idea of the immense size of the vein. Other portions of the mine show ore in quantity, and it is all rich in copper. The improvements made during the past summer are all in the direction of increased convenience and facility in handling the ore. As stated last week, the force of employes at mine and smelter has been considerably increased, and operations will likely be continued on the present liberal scale while the activity and strength in the copper market continues.

RICHMOND BASIN.—Richmond Basin mines continue to reward industrious miners. Joseph Brewster is especially fortunate in having struck the ledge in his mine—the Southern Star—close to the line of the Harrison & Morton and a continuation of the ore body in that claim which has yielded handsomely in silver. The ore in the Southern Star is of the same character, assaying from $600 to $1000 per ton. The Harrison & Morton is still producing excellent ore. The claim is now owned by Thos. Moyle, Harry and Tom Letcher having sold their interest to him. Harry Letcher brought in 2600 pounds of high-grade ore from the H. & M. mine, on Tuesday, for shipment to Socorro, N. M. Joe Henry and Wm. Gill are getting good ore from the Helen claim. Lou Scanland is taking out some native silver from the Last Chance. Richmond Basin is one of the best silver camps in Gila county, and in view of the continued advance in silver, the outlook for the Basin is bright.

BRITISH COLUMBIA.

A $350 NUGGET.—Kamloops *Sentinel*, Nov. 23: Mr. W. F. Anderson of Cariboo passed through Vancouver the other day on his way to Victoria. He had in his possession a 14-ounce nugget, a perfect beauty, worth $250, taken out of the Anderson & Smith claim on Snowshoe creek. He reports that several have been secured this season varying from 8 ounces up to 24 and 30 ounces. Miners are looking forward to a lively period next season, and all regard the prospect as excellent.

GOLD. — E. Goodwin is in town to day from French creek, in the Big Bend country. He has with him a quantity of gold to the value of $400 taken out of the claim in which he is interested there. He claims to have struck it rich, and reports good prospects for that country in the near future.

DAKOTA.

SYNDICATE SMELTERY. — Deadwood *Pioneer*, Nov. 27: The mill of syndicate smeltery is nearly complete in all particulars. Frank Shaw, who has charge of machinery and work of setting it up, expects to finish his part by to-morrow night. The plant will be in condition to start up Saturday or at latest Sunday. It is not anticipated fires will be built, however, until after Mr. Miller's return from Helena, expected next week. The first or test run, it is currently reported, will be on Golden Reward ore, to be obtained from dump near reduction works. How much of this will be put through could not be ascertained, probably from two to three hundred tons. It is less than 30 days since excavations for foundation of plant were commenced. The short time required to complete it speaks well for the energy of those managing the work.

MORE PYRITES.—Dave Short was down from Bald mountain yesterday, and exhibited specimens of pyrites carrying gold and silver. The vein from which they were obtained is large, and is found in a location at the foot of Bald mountain. The discovery is not entirely new, but little attention was paid it until the knowledge became general here that pyrites is just what is wanted for flux in treating the refractory gold and silver ores of Bald mountain and Ruby basin.

COLORADO.

SAN JUAN.—*Denver Republican*, Nov. 29: The future of mining in that section of the silvery San Juan known as the Red mountain country presents to him who is conversant with its past and present record as a producer and the magnitude and richness of its veins, the most brilliant possibilities. The unexcelled prosperity of the Yankee Girl, Gusten and Robinson, and the continuation of their rich ore chutes, as shown by deep mining, will strengthen the wavering tendencies of smaller companies and cause them to push ahead to almost certain success, while by the completion of the Silverton & Red Mountain railroad to Ironton the great contact mines of Brown mountain will be enabled to employ large forces of men and ship thousands of tons of ore at a fair profit where it would have been impossible 18 months ago, by the primitive burro train and ore wagon methods, to have shipped any but the highest grades of this ore, amounting to a very small per cent of the great bulk mined.

CARBONATE.—Late arrivals from Carbonate report more than usual activity in mines thereat. Spanish R., Seabury, Iron Hill, and a number of lesser lights are working forces. The number of men employed is greater than at any time before in 18 months. As the year draws to a close and it becomes necessary to do annual assessment work, the number will increase largely. Spanish R. is shipping ore to Kansas City, Seabury is taking out ore, but holding it until local smelteries are in operation. Iron Hill is about getting ready for another run of its smeltery.

IDAHO

AN IMPORTANT STRIKE. — Wood River *Times*, Nov. 27: An important strike of ore is reported in the Red Elephant group of mines, near Bullion. This excellent property is evidently showing more value right along, and when thoroughly opened will prove very remunerative.

LOWER CALIFORNIA.

A NEW STRIKE.—Alamo *Nugget*, Nov 27: Last week Joe Guyette, a French prospector, found some rich float on the west side of the creek, three miles below the oaks off the Santa Catalina road. Some of it was brought to town and mortared at the rate of five dollars to the pound. Many of the leading prospectors in camp have been taking a lively interest in the new discovery, since it looks at present writing as though a valuable outlying province is to be added to Alamo. On Friday last, Tom Owens visited the locality and thought the discovery of sufficient importance to return Monday. Up to to-day he has not come back from his second trip. Sierra, Trumbaugh and a dozen others left Monday and Tuesday. They are slow about returning and among prospectors this is a good symptom. The new find is on the west side of the creek above La Poza, some distance up the mountain at that point and very nearly due south of Alamo. In a direct line it is probably not more than six or eight miles from here. It is highly probable that a valuable belt of seams, if nothing more, has been discovered.

MONTANA.

COPPER BOUNDARIES.—Butte *Inter-Mountain*, Nov. 26: So far in this mining camp, copper is confined to a small radius of territory compared to the vast mineral-bearing portion of the country. In fact there is no portion of the country but what is mineral bearing of some character, and all parts of it contain silver. The copper portion is that portion bounded as follows north, and including a portion of the Grey Rock: South by Park street, east by Silver Bow creek, and west by Missoula Gulch. In this portion of the country is being exclusively conducted the copper-mining industry of this camp. South of Park street on the leads running in that portion, no doubt is held that if sufficient depth were acquired, the developments would terminate in as rich copper producers as that portion now being worked by the large copper companies. The question as to whether the copper ore bodies extend farther in an easterly course will be solved by the new shafts at present being sunk for that purpose on the flat east of the Silver Bow mill, and appearances thus far are favorable. When sufficient work will have been performed there is no doubt a good showing will be made. All surrounding this copper portion of country is completely stratified with veins bearing silver. On the south, the main difficulty has been the vast amount of water to be handled. As to the ore being in existence farther south there is no question, as the richest character of ore thus far uncovered has been in those parts. On the north of the district mentioned are situated all the big silver mines with very few exceptions, the Moulton, Alice, Lexington, Magna Charta, Moose, Amy and Silver Smith; on the west, the Burlington, Nettie, Blue Bird, Champion, Moody and Sankey; and on the east, the Park Canyon district, it is now claimed almost to a certainty that the copper belt of country extends, as is witnessed by the very recent developments in the Homestake. Some have surmised during the past that as the mines continued in depth those now silver bearing would ultimately terminate in copper, although occasionally in the big silver mines of the camp an occasional bunch of copper ore is encountered. The absolute truth has yet to be proved as to whether such be the case or not.

TO PROSPECT WITH DRILLS.—Butte *Miner*, Nov. 25: Although considerable talk has been indulged in lately by some of the larger mining companies in Butte relative to the sinking of shafts on the flat between the Silver Bow mill and the range of mountains east, no definite steps with that end in view have as yet been taken. The talk of sinking the shafts has now almost died out, but another idea has taken hold of some enterprising capitalists which will in all probability result in determining the continuity of the copper veins of this side without going to the enormous expense of sinking shafts at various points. The new arrangement is the employment of the diamond drill at various places on the flat, and the general impression is that it will determine in a short time what is underlying the flat. The parties who have proposed this means of prospecting the flat are not connected with any of the larger mining companies hereabout, and it is not yet known where their "divvy" will come in if something is struck. They are Eastern men, and claim that they can easily prospect to a depth of 1000 feet with a diamond drill. In case arrangements are made for doing the work, drilling will commence early next spring.

THE MCDERMOTT. — Deer Lodge *New Northwest*, Nov. 29: The McDermott, in First Chance district, is showing up better with every foot of development. Six men are at work drifting on the lead and they are taking out some very good milling ore.

THE MILDRED.—A number of mining men from Anaconda visited Oro Fino last Friday to look at the Mildred—among them John Earll, who, it is understood, will have charge of its development. The claim adjoins the Phœnix on the east, and in the discovery shaft, which is down 80 feet, makes a splendid showing.

THE KEYSTONE.—The recent strike in the Keystone is turning out better than at first supposed. President Sparkman took a number of specimens to Butte for assay last week and the returns ranged from 36 to 141 ounces.

THE CHAMPION.—Supt. Mills informs us that nearly three feet of splendid high-grade ore has come in on the face of the west 350-foot level. It is the finest considerable body of ore ever struck in the mine.

THE AMERICAN RUBY.—The east drift on the vein in the American Ruby is in a distance of about 25 feet, and the 20-inch streak of high-grade ore encountered on the south wall in the crosscut still holds its own. Mining men regard the American Ruby as a phenomenal strike.

SOUTHERN CROSS.—The Southern Cross company has taken an eight months' lease of the new Salton-Cameron 10-stamp mill at Georgetown, and last week the stamps commenced dropping on ore from the Southern Cross mine.

NEW MEXICO.

ORE VEINS CONSOLIDATED.—*Southwest Sentinel*, Nov. 26: The veins on Bell & Stephens' Pacific and Skillicorn & Snyder's Pacific mines at Pinos Altos have come together at a depth of about 220 feet, where there is an ore body six or seven feet in width which averages over $15 a ton. These veins are some distance apart on the surface, but the difference in pitch is such that they have merged into one vein. Only $1775 worth of bullion was shipped through Wells, Fargo & Co.'s express office from this point last week.

GEORGETOWN.—Georgetown is holding its own as the principal bullion-producing camp of the Territory. All the mines are being profitably worked. Bragaw & Schlosser's leasehold on the McNulty, Naiad Queen and Commercial mines, covering an area of about 500x700 feet, is producing good ore and lots of it. Most of the ground is sub-leased to miners and nearly every man of the 50 there at work receives three-fourths of the profits of his own labor, which is generally more than miner's ordinary wages. A carload of ore recently shipped to the Socorro smelter produced $2498, being an average of $202.50 per ton. The Mimbres Con. M. Co. is driving tunnels and crosscuts into the Scottish. Their deepest workings are about 2000 feet from the incline shaft station on the Commercial. Deemer & Acosta have a lease on a block of ground on the first level of McGregor & Grampian's mines, and are taking out considerable ore that will run over $400 a ton. Fifteen men are at work in the Reynolds' Satisfaction mine, nearly all of them being leasers. They are taking out good ore and making more than wages. Deemer & Schlosser have a lease upon a large portion of the McGregor mine, most of which has been sub-leased to others. Much ore is being taken out. The miners at Georgetown have finally got rid of the Mexican adobe smelter. Joe Schlosser gave Colorado, the smelting man, a good lease on condition that the smelter would be closed down.

DEVELOPMENT WORK.—Silver City *Enterprise*, Nov. 29: The revival of the copper market will soon set things to humming in this section. With a proper freight rate hundreds of cars could be loaded here daily with a high-grade zinc ore, which under the present tariff cannot be handled at all. George Goodwin was in from the Yankee Girl this week, having shipped about 75 tons of ore from the dump, which is now being put through the Bremen mill. Seven carloads of iron were shipped out of the city on Tuesday. The average daily shipment of iron is about three cars. Experiments have been made with this iron recently, and it is claimed that it is specially adapted to the manufacture of heavy guns. John M. Wright has gone to Carlisle, taking J. T. Reed along to run some lines on the Jim Crow, in which he has lately secured an interest. While there, Mr. Wright will let a contract to sink a main shaft and otherwise develop the property. The Pacific will pay off in a few days, and will probably resume operations in a short time. A new plant may not be erected at present, but the old one will be changed somewhat. More plates will be put in and different concentrators added. J. W. Fleming has purchased from John Wilson Howard an undivided one-third interest in the Maud S, one of the Silver creek bonanzas in which Capt. M. Cooney is interested. The property is one of strong merit.

CLIFTON.—*Western Liberal*, Nov. 29: The San Francisco mine, a copper property owned by Carrasco & Salcedo, has been sold to the A. C. Co. This mine produced in about one year and ten months over $30,000 by manual labor, no machinery of any kind ever having been used.

OREGON.

SMELTING AT MINERAL CITY.—*Bedrock Democrat*, Nov. 26: The Porphyrite smelter at Mineral City started up Nov. 3d, and with the exception of a short stoppage rendered necessary by repairs to the apparatus, has run continuously since with great success. The extraction of silver and gold is most complete. This is the first matting furnace ever introduced in the Pacific Northwest, and, as far as results go, proves equal at least to the ordinary lead-smelting process, and in its adaptability to the conditions of mining in the Northwest is infinitely superior to any lead-smelting plant, however extensive. The works have a capacity of 30 tons per day, and can be easily and quickly enlarged to twice that amount. It is highly probable that such an increase in the capacity will soon be made, for the quantity of ore now in sight in the Porphyrite Co.'s mines is thought will warrant such enlargement. The company buys all ores thus far offered, paying cash therefor, and charging the lowest rates. Mineral is now the only mining camp in the Northwest which has a cash market for its ores at home. The smallest as well as the largest lots can be sold for cash at the smelter, whose working charges are not above those of Leadville or any other mining camp. Besides, the company makes no charges for sampling.

CORNUCOPIA.—Another rich strike is reported in the lower tunnel of the Red Jacket mine at Cornucopia. A ledge eight feet in width of solid ore averaging $60 to the ton is said to be the proportions of the strike.

SPARTA.—The mining outlook of the Sparta region never looked brighter than now. It is highly probable that several wealthy mining companies will be operating there extensively before many months.

GRAVEL AND QUARTZ. — Jacksonville *Times*, Nov. 29: Some mining is being done in the bed of Jackson creek, near town. Considerable prospecting is going on in Jackson and Josephine counties. Ennis and Cameron have everything in full blast at their Galice creek mine. Considerable prospecting and locating is again being done on Briggs creek, Josephine county. Piping has been going on at Henry Ankeny's mine in Sterlingville precinct for the past few weeks. A continuation of the rainstorm, which has been raging for the past few weeks, will start operations in all the mines. A 60-foot tunnel in the Ridgway & Ewing mine on Grave creek gives indications of good returns in the near future. E. Band, who is now in the employ of the Sterling Mining Co., informs us that piping commenced at their mines last week. Kiessling Bros. of Williams creek are down 75 feet on their main shaft, and show some splendid specimens of high-grade ore taken therefrom. Green Bros. are making good headway on their shaft on Galice creek, and their ledge improves in both quality and quantity as they go down. J. T. Layton has everything in readiness for a big run at his mine on Farris gulch. This is one of the most uniformly paying mines in the county. The Josephine county mines are attracting much attention from capitalists in all parts of the coast. Since the rains seem to have begun in earnest the mining population feel encouraged. A wet winter would put many thousands of dollars in circulation, for the miners were never better prepared to do good work. John B. Irwin has discovered one of the richest free-gold properties ever found in the State, in Union county. The quantity is large, and the best judges say it is a free milling composition of at least $100 to the ton in gold. Good prospects are reported from the vicinity of the Holman ledge, in Jackson creek district. Work is still progressing there, a fine vein of ore having been struck by the tunnel run by J. H. Huffer and others. Crow & Thorndike are now sole proprietors of the promising quartz ledge discovered near Galice creek district some time since, having purchased the interest of their partners. They are working the ore in an arastra. Samuel Sterling, an old and well-known miner in southern Oregon, has struck rich placer mines on the headwaters of Coquille. He reports having also found a very rich quartz ledge in the same vicinity. The new discoveries lately made by Mr. Sterling are near the old "Johnson Diggings," located near the adjoining corners of Coos, Curry, Douglas, and Josephine counties. The rich pay gravel which is now being worked out in the Wadleigh mine on Illinois river, is directly underneath the rich diggings worked over by Wimer and others in early days, a substratum of pipe clay intervening between the two gravel beds. At the time of the cave-in recently, the Wadleigh mine had already paid a handsome dividend over and above the expense of running 30 men, not to speak of hoisting machinery lately purchased, costing nearly $4000. A person going into the drift with a candle can see the specks of yellow metal in the gravel on either side. The cave was caused by water percolating through the bed of pipe clay that now forms the bed of the river. The water can be turned out above, and the mine will soon be in operation again. The discovery of the lower deposit of gravel was a fortunate circumstance for the proprietors, especially as the claim is on school land, to which they hold title, and the sub-deposit seems to be of unlimited extent.

UTAH.

REVIEW.—Salt Lake *Tribune*, Nov. 27: The receipts in this city for the week ending the 27th, inclusive, were to the value of $143,155.12, of which $73,579.32 was in ore and $69,575.80 was in bullion. For the previous week the receipts were to the value of $64,800.37 in bullion and $75,368.17 in ore—a total of $140,168.54. The product of the Ontario for the week was in ore sales, $7520.49; bullion, 21,059.06 ounces, an approximate total of $28,579.55. The Daly output for the week was from ore sales, $4773.86. Sulphides collected for part of August, September and October, $153,258.86. The Horn Silver mine continues its moderate output, and ships the ore to Colorado. There must be a considerable surplus, perhaps $250,000, in the treasury or out on call loans in New York, and the company ought to pay a dividend. Bullion receipts in this city during the week were to the value of $38,610.48; fine bars, $8535. The Hanauer smelter produced during the week bullion valued at $11,960; the Germania, $10,463.86. Ore receipts in this city for the week were to the value of $20,116.22 by Wells, Fargo & Co.; $37,850 by McCornick & Co., and $15,613.10 by T. R. Jones & Co.

WASHINGTON.

A NEW COAL SHAFT.—Ellensburgh *Capital*, Nov. 28: Work is about to begin on a new shaft at Rosyln. It will probably have three compartments and be provided with the strongest and best machinery. The company has drilled down 580 feet, and at that depth found the coal. The shaft will be sunk that depth at once, and then the work of taking out will commence. This will necessitate the employment of a large force of extra men and Roslyn should boom as soon as it is completed. No. 3 is now working 300 men, and a lot of coal is being taken out there. The lower mines are also doing well. It is reported that a fine vein of coal has been found about a mile above No. 3. If this turns out well, Rosyln will have to look out or a big town will spring up around No. 3.

MECHANICAL PROGRESS.

Who Invented the T Rail?

When railroads first came into use the "rail" was simply a flat bar of iron laid upon a string-piece of timber. The ends of these rails were constantly working loose, and unless carefully guarded and watched, they would soon turn up and go over the wheel instead of allowing the wheel to pass over the rail. The result would be that the rail would pass up through the car and often out through the roof to the danger of the life and limbs of passengers. This trouble was soon obviated by the introduction of the T rail. The first rails of this pattern were rolled in England, and it has long been claimed to be an English invention, and was long known in England as the "Vignoles" rail, after an English engineer who claimed to be the inventor.

A late number of *Engineering News* of New York, however, contains a facsimile reproduction of a drawing, and an accompanying letter written by the late well-known engineer, Robert L. Stevens of New York, written some five years prior to the date at which Vignoles claims to have invented his T rail. Mr. Stevens was in Europe at the time after locomotives and other railroad supplies for the then Camden & South Amboy railroad, of which he was chief engineer. The address is not given, but the letter accompanying the drawings reads as follows:

GENTLEMEN:—At what rate will you contract to deliver at Liverpool, say from 500 to 600 tons of railway, of the best quality iron rolled to the above pattern in 12 or 16 feet lengths, to lap as shown in the drawing, with one hole at each end, and the projections on the lower flange at every two feet? Cash on delivery. How soon could you make the first delivery, and at what rate per month until the whole is complete? Should the terms suit and the work give satisfaction, a more extended order is likely to follow, as this is but about one-sixth part of the quantity required. Please to address your answer (as soon as convenient) to the care of Francis B. Ogden, Consul of the United States at Liverpool. I am your obedient servant,

ROBERT L. STEVENS,
President and Engineer of the Camden & South Amboy Railroad and Transportation Co.
Liverpool (month invisible), 1830.

The shape of the rail, as shown in the drawing, is almost precisely like the rails now in use, with the exception that the base is narrower. The *Engineer* says: "The width of head and form of top and corner is almost precisely what practice has approved of. In so far as we have deviated by making the head deeper we have deviated injuriously, and are coming back to his general form. The same remark applies to the thickness of the web, which we now know to be little if any too thick in proportion for proper rolling, the modern fad for thin webs having resulted disastrously. The hight of the rail is almost exactly the same as the average width of the base, as the latest practice demands, which average was adopted for the rails shortly after rolled, in response to this inquiry, although we are unable to state what was its precise width. The spacing and size of ties (which had not then even a name, but were called simply 'supports') also corresponds exactly to what modern practice has approved and perpetuated. The one thing which looks awkward about the rail section is its very flat base, although we are by no means clear that this was really ill-advised, or would be now. The shape of the head is a very good compromise between the extreme pear shape and the modern form of square head which has come in with the fish-plate.

"It is an interesting fact that the rails rolled under this first order literally 'wore like iron.' They were iron; such as could hardly be had at any price 30 years later. For aught we know, there may be some of them still in use on sidings; there were some a few years ago, and if any still exist they ought to be preserved.

"It is not often that it has been given to man to effect by a single drawing such widespread and long-continuing effects as resulted from the one we here reproduce full size."

These rails were rolled in England, brought over to this country and laid down on the Camden & Amboy road, and were the first rails of the kind ever laid down on any road, either in this country or Europe.

The Value of Silicon in Iron.

Mr. Hadfield of England, in a paper read at the late meeting of the Steel Institute of Paris, said that silicon is a "dog" which has been given a bad name. To its influence upon iron and steel injurious effects have been attributed such as it does not really exert. Any quantity exceeding 10 per cent, or up to 20 per cent at most, has been considered to be highly injurious. This blame may seem to be well deserved in the case of alloys of carbon, silicon and iron. Such alloys, as regards ductility, are untrustworthy and have very little value. The blame, however, has been wrongly put upon silicon. It is now proved that silicon alloyed with iron, provided that carbon is absent or is present only in small quantities, gives good tests as to toughness and malleability. While, therefore, it is quite true that alloys of carbon, silicon and iron are brittle and even dangerous, the presence of silicon is not the only cause of the vil. It is rather the combination of silicon with carbon and iron. However, there is, says Mr. Hadfield, some feasibility in Mr. Hawe's suggestion that possibly silicon may enter into different combinations in steel, some promoting and some impairing, the qualities of ductility and malleability. Mr. Hadfield described some specimens of forged steel, containing up to two per cent of silicon, which present a remarkable ductility and toughness. Silicon alone does not produce a steel that will harden by water quenching, in this respect resembling manganese steel.

Silicon's Effects Upon Iron.

Apparently silicon, up to 1½ or 1¾ per cent, added to iron, although increasing the limit of elasticity and raising the tensile strength, does not impair ductility. But beyond this proportion the further increase of tensile strength noticed is only obtained at the sacrifice of a serious portion of the metal's ductility. There is no sharp line of demarcation, but after about 1½ to 2 per cent are exceeded, further slight increases cause great changes in the characteristics of the material. In this respect the action of silicon rather resembles that of carbon, in contradistinction to that of manganese. Of this latter metalloid larger amounts are required to effect similar changes. The tests clearly prove that silicon does not confer the same property as carbon does upon iron, that is, of rendering it liable to harden when dipped hot into a cooling medium.

Silicon Steel.

Mr. Hadfield's experiments have demonstrated that silicon itself does not cause iron to become red short. This conclusion is plainly deducible from the fact that the whole of the samples were subjected to high heats and even to a welding temperature without falling to pieces. In this respect their behavior was not unlike that of mild steel. Its fluidity when being poured is less than that of ordinary steel. The form of fracture of the lower percentages rather resembles that of ordinary mild cast steel, but when about 2½ per cent is exceeded the crystallization becomes larger and more marked and the material is rendered very brittle. Further additions of silicon transform it into a material approaching the appearance of silicon pig iron and non-malleable. High percentages of silicon in the cast or unforged material cause a considerable increase in shrinkage or contraction.

Practical Results.

Mr. Hadfield does not claim that there is any field for the employment of such an alloy or high silicon steel as that with which he has experimented. He disclaims any other purpose for his paper than the treatment of a subject of purely scientific interest, and the chronicling of the actual effect of the metalloid silicon on iron. And he concludes with the dictum that silicon cannot take the place of carbon in iron; which assurance he supports by the statement that carbon has the two advantages of being more readily applied and of producing a material better suited to the requirements of steel-users.

Leather Ropes.

W. H. Booth writes to the *American Machinist:* During a recent tour in Yorkshire through the woolen district, I had an opportunity of seeing a fairly large installation of square ropes of leather, which were giving great satisfaction.

These ropes were built of leather strips 1¼ inches wide up to a square cross-section, every strip breaking joint. They had been running several years and had about ceased to stretch, having been shortened four or five times by seven or eight inches at a time, a total length of one yard being in all removed.

I made special inquiry into the method of splicing, and found it to be by common wood screws, simply screwed into the material. The large driving drum was 21½ feet in diameter, and the rate of revolution was 46 per minute, the speed of the ropes being only 3100 feet per minute. Formerly the speed of revolution was 60, but it had been reduced for some reason, and, though the weight turned was now much less than formerly, the ropes at the slower speed showed more signs of distress than before the reduction.

There were 16 ropes in all, and some of the ropes lay twisted in the grooves, and there seemed little or no difference whether a rope lay as intended or became twisted and riding on its corners.

The grooves in which the ropes lay did not seem to be turned square to fit the ropes, which, when not revolving round their own axis, lay with one flat side against one or other of the inclined sides of the turned grooves.

Considering the great strength of leather, such ropes seem to offer one of the best means of transmitting power between fast-running pulleys.

It seems probable also that a square rope will absorb much less power than a round compressible rope of fibrous material, which are usually made to run between the sloping sides of V grooves, and must waste much power in internal friction and differential velocity friction. In breadth of pulley-face occupied, the square rope has the advantage over double belting to the extent of fully 50 per cent, even in ropes only 1¼" square, the advantage increasing as the side of the square increases. Leather belts, too, which can be pieced by so simple a means as wood screws, are easier to splice and shorten than are ropes in which the neatest splice is either thicker or weaker than the body of the rope.

SCIENTIFIC PROGRESS.

Curious Phenomena.

Curious and unexpected phenomena, oftentimes of a dangerous character, are constantly occurring in connection with the various phases of human industries, many of which require much study in regard to their cause. A circumstance of this character recently occurred at the Frankfort shops of the West Shore railroad. A cast-iron piston 18 inches in diameter, having been worn out, was removed from an engine and thrown into the scrap-pile. Some time afterward it was taken from the pile with other scrap, and being too large to use in the cupola, was carried to the breaker. On being struck it broke in two parts and immediately began to act in a remarkable manner. The iron turned to a red heat and from that to a sparkling white, while from the hollow parts a flame arose to the hight of three or four feet, throwing out sparks as though it were filled with damp gunpowder.

The man who broke the piston became frightened and threw a pail of water on it, which deadened the flame somewhat, but it continued to glow and throw out sparks for some time, to the amazement of the 20 or more men who stood looking on.

J. R. Slack, the chief draftsman of the West Shore, has referred the case to various scientific men, but has received few satisfactory replies.

One opinion is that cylinder oil worked into the hollow part of the piston around the plugs which filled the core-holes, and under the high temperature and pressure to which it was subjected, united with some of the core sand remaining in the piston, formed a highly combustible compound, which ignited spontaneously on exposure to the air.

Another theory is that the loose core sand, being thrown backward and forward by the motion of the piston, wore off a considerable amount of iron in an exceedingly finely divided condition, which ignited on exposure.

It is well known that a great many substances, iron among others, may be so finely divided that, when thrown into the air, they will take fire spontaneously, but it does not seem possible there could have been enough atomized iron in this case to cause the excessive amount of heat shown.

Whatever the cause may have been, the facts are as stated, and it is the only case of the kind on record.

The *Safety Valve*, from which the above is copied, considers the cause of the explosion as still a mystery.

A case somewhat similar was alluded to in these columns, some time since, in which an old piston casting, which had been thrown into the scrap-heap, had suddenly burst with a loud report, but without any reported display of incandescent activity.

Explosion in a Culm Bank.

An occurrence equally sudden and unexpected with the above recently occurred in a culm bank at a colliery near Scranton, Pa. This was certainly one of the most phenomenal occurrences ever recorded in the history of coal mining, and especially in the history of anthracite mining where gases are less often met with than in mines of soft coal. We condense from *Fire and Water:* Two men were standing at the bank, where the refuse was 150 feet deep and in the act of dumping two carloads of rock. Just as one was about to be dumped, the men were almost paralyzed with astonishment at a strange spectacle which met their eyes from the culm surface below them.

For the space of 20 feet square a thousand tongues of fire were issuing from the dirt. Then the coal began to crackle, and huge streams of black smoke to soar heavenward. One of the men shouted, "My God, what's the matter?" His companion, who had a dumper, pulled out the pin and turned the dumper around on a pivot, and as the rocks struck the dirt it was noticed that the edge of the bank near the rails began to slide. When another load of rock was sent down the bank the dirt, which was rushing from the edge, stopped, and as the rocks struck the center of the flames a terrific upheaval of rock and dirt took place, but not with the slightest sound of an explosion. As if hurled from a battery of Krupp guns, a thousand balls of redhot rock went high in the air, while a river of fire ran down the bank like lightning. Then the scene became obscured by volume after volume of smoke and dirt, and a sulphurous odor arose that almost smothered the men in the bank. The smoke hid the surroundings for a mile around. The smoke followed the course of the wind up a ravine, then through a valley to Coal Run, a mile away, where a number of inhabitants had their washing hanging in their yards. The clothes were made as black as night.

When the middle of the bank first gushed forth flames, a woman was observed picking coal at the bottom, in a direct line of the course the flaming stream of fire took. It was a Mrs. Boney, and with her a four-year-old son. When she heard the man shout she rushed down the road about 50 feet, and threw her son into her door-yard. As the upheaval took place she stood safely on the road, but did not know how her son had fared. The smoke gradually cleared away, and a terrifying sight met her gaze. The fiery stream ran off the bank and had entered her yard, and for a space of 30 feet seethed and waved to and fro in a compact body three feet deep. Every moment the terrified woman expected the house to be flooded with fire and the people inside perish. Then another unprecedented incident occurred. The crater in the center of the bank received a rush of rock and dirt from the top, and the shock was sufficient to carry a volume of dirt 25 feet wide and 4 feet deep down the bank and into the yard.

When Mrs. Boney entered her home she found that her son had worked his way into the house, where Mr. Boney's mother, aged 75 years, and a number of small children were found huddled together in the kitchen almost smothered with smoke and dirt. About the premises many fruit trees were consumed. A dog in the track of the fire was cremated.

For the past 12 years dirt has been dumped upon the heap, and about five years ago, while some people were picking coal off the banks, they built a fire at the base to warm themselves. The flame ignited the coal, and the bank became a fire, burning from the bottom up, until in the early part of this summer flames appeared on the top of the pile. Four months ago jigs were put in the breaker to clean coal, and the dirt has been very wet ever since, a dumper being often half-filled with water when it was taken to the bank and dumped, the water finding its way to the fire, where it evaporated. A large hole was probably eaten in the bank where gas accumulated, and was kept in by the wet dirt, which finally became dry from the heat, thus admitting air and causing the explosion. The news of the culm bank explosion has spread through the entire coal regions of Pennsylvania, where many thousands of banks lie, and has caused great alarm, as in nearly every instance the banks are on fire.

NATURAL ELECTRICITY.—An extraordinary tale comes from Burmah. Mr. Ronald H. King, an electrician well known to the Burmese, while on a prospecting and shooting expedition in the Island of Labuan, is said to have discovered a mineral from which electricity can be obtained without apparatus of any kind whatever. The mineral is described as being in the form of a black stone, of excessive hardness and very great specific gravity, being nearly as heavy as platinum. A small block in the shape of an irregular cube, measuring 4.3 inches one way by 5.2 inches the other way, was brought away, and on bringing it to the testing-room a strong effect was noticed upon the galvonometer. At first it was thought that the mineral was an ordinary loadstone, but on tests being made it was found that the force was more akin to that of an electro-magnet, and that a strong current would flow when the mineral was connected in a circuit. Further tests revealed that a difference of potential of 47 volts could be detected at the extremities, the internal resistance of the mass being 20 ohms. The block appears to waste away very slightly, leaving a slight gray powder upon the surface when connected up for some time. The electrician now uses the block to light a couple of incandescent lamps in his laboratory.

A WOMAN'S DISCOVERY.—A woman is said to have removed one of the greatest annoyances of photography. If it were not for the time and trouble it takes to properly develop photos, amateur photography would be one of the most delightful occupations one could engage in. The cause of complaint will soon be removed, as by a recent discovery, and that by a woman, Mrs. N. Gray Bartlett of Chicago, the wife of a prominent analytic chemist, pictures can be developed without the old-time process of washing in a dark room for hours and staining the fingers. By her process there is nothing to be done but to expose for a few minutes the negative, with the sheet of paper clapped on it for a few minutes, to the light. The pictures produced by Mrs. Bartlett's process are said to have the appearance of fine etchings.

EXPERIMENTS WITH PETROLEUM VAPOR have shown that air mixed with 5 per cent of the vapor does not explode; when, however, the proportion rises to 6.25 per cent a slight explosion take place, while with 8.3 per cent the explosion becomes violent. The most violent explosion takes place, however, with from 11 to 12 per cent of vapor; beyond this limit the violence of the explosion decreases, and when the air contains 20 per cent of the vapor no explosion occurs.

IMPROVEMENT ON THE PHONOGRAPH.—In the present phonograph, a stylus for impressing the wax is attached to the center of the vibrating diaphragm. The new improvement of G. Bettini is to extend little rods from the stylus to several parts of the diaphragm. In this way greater exactness of tone and speech is obtained, so the inventor claims, and much superior results.

ELECTRICITY DIFFERENTIATED. — Some one asks what is the difference between electricity generated by chemical process and that generated by friction, magnets and otherwise? The answer given is that the difference consists in tension or potential; frictional electricity has very high tension compared with that generated by a battery.

TO DETECT CARBONIC OXIDE.—M. Racine has contrived an apparatus which indicates the presence of three-fourths per cent of carbonic oxide in the air. A mixture of CO and air will cause platinum-black to glow; this burns a thread; an electric contact is thereupon made, and a bell rings.

GOOD HEALTH.

BEWARE OF QUACKS!—Nearly every newspaper you may pick up contains the picture of the venerable looking old man, and below it the statement that he wishes to do you good by telling you how to regain lost health. In another place you may read in large letters, "Manly courage, how lost, how restored." In still another you may find the picture of two people, one beside the other, the one the picture of robust health, the other of general debility and long-time sickness. All those advertisements directed to victims of youthful indiscretion, in nine cases out of ten, are the veriest humbugs. Millions of dollars a year are thus drawn from the unsuspecting young men of the country. These vampires gather in their victims by thousands, and grow rich off the credulity of those who patronize them. Young men, if you have any disease of any kind, go to your home physician for advice and treatment, and never trust yourself in the hands of these advertising quacks. By this the *Standard* does not mean to denounce the use of a large number of standard patent medicines which are advertised in nearly all papers, but when you see advertised some peculiar specific for private disease, "advice sent by letter," etc., let that remedy alone. The quack who uses newspapers to place his specific before the people will not only take your money, but perhaps ruin your health. Go to a physician in whom you have confidence, and trust him.—*Humboldt Standard.*

STARVING A COLD.—The man who originated the oft-quoted maxim, "Stuff a cold and starve a fever," either did not understand what he was writing about or he has been widely misunderstood, to the great injury of multitudes who have acted on the absurd maxim. Presuming that the author of it was a physician, who knew something of the nature of a cold and the action of remedies, he must have spoken subjunctively, and not imperatively. And then it would read thus: "*If* you stuff a cold, the consequence will be that you will be thrown into a fever, as the *result* of the stuffing treatment of the cold, and *then* you will have to starve the fever." This is a true and sensible interpretation of this commonly received maxim, which has done as much harm as any of the thousand and one popular errors which prevail on medical subjects. * * * Without dwelling on the nature and causes of colds, or on what physicians call the pathology of these disorders, I will say that a low or even starvation diet for a few days, with the free drinking of warm, mildly stimulating teas, is better for a cold than any drug or combination of drugs. If with this a warm bath or hot foot-bath is taken, little more will be needed. Nine cases out of ten of colds can be broken up in this early stage by a hot foot or rather leg-bath, keeping the bath as hot as it can be borne until perspiration arises. After the bath, drink a half-pint of hot lemonade and go to bed.—*Woman's Work.*

PROTECTION OF THE EARS UNDER CANNON FIRING.—Dr. Samuel Sexton of this city says: "It is the experience of many officers that the vibrations of great intensity which are given off from some field-pieces and bursting shells, charged with high explosives, are more disagreeable than the heavier sounds of great guns. The metal itself vibrates under these circumstances similarly to a tuning-fork. A very disagreeable jar is imparted to the temporo-maxillary articulation when the individual is near a great gun being fired off. This is lessened, it is believed, by standing on the toes and leaning forward. Some simple precaution, to be employed by officers and men during artillery practice, would seem very much needed, since aural shock is not only painful and distressing, but orders cannot be well heard while the confusion lasts. There is probably no better protection than a firm wad of cotton wool well advanced into the external auditory canal. In suggesting this protection, it is believed that harm can seldom take place from pressure of air from within, since it is known that the violent introduction of air into the tympanum from the throat, by means of Politzer's method of inflation, seldom ruptures the drum head, though, if such a volume of air were suddenly driven into the external auditory canal, the drum-head would in nearly all cases be ruptured."—*Scientific American.*

REMEDY FOR HEADACHES.—When in certain painful affections the physician advises the use of cold applications, and if the effect from them is not pleasing, then that hot should be tried, the patient is likely to consider it rather an uncertain sort of treatment, of doubtful value either way. It is, indeed, rather a curious thing that heat and cold can often be used interchangeably with like effects. Extreme heat will destroy the skin, and extreme cold will do the same. Now, headache is sometimes relieved by hot applications, and yet in some instances it aggravates the trouble. In case of the latter, oftentimes the cold applications will effect a cure. As a general rule, a throbbing headache, with tenderness and soreness of the scalp, can best be relieved by hot applications; whereas, when the head feels full and "bursting," if cold be applied to the head, and heat to the neck and spine, the effect is most agreeable. Probably one of the best external applications which is most serviceable in the different forms of headache is menthol. A solution of that should be made in about the proportion of one drachm of menthol to ten of alcohol. It can be applied on a thin strip of cloth large enough to cover the forehead. That should be kept wet with the solution. It is very cooling, and the effect in many cases of headache is very agreeable from the first.

HOW AND WHEN TO DRINK WATER.—According to Dr. Leuf, when water is taken into the full or partly full stomach, it does not mingle with the food, as we are taught, but passes along quickly between the food and lesser curvative toward the pylorus, through which it passes into the intestines. The secretion of mucus by the lining membrane is constant, and during the night a considerable amount accumulates in the stomach; some of its liquid portion is absorbed, and that which remains is thick and tenacious. If food is taken into the stomach when in this condition it becomes coated with this mucus, and the secretion of the gastric juice and its action are delayed. These facts show the value of a goblet of water before breakfast. This washes out the tenacious mucus and stimulates the gastric glands to secretion. In old and feeble persons water should not be taken cold, but it may be with great advantage taken warm or hot. This removal of the accumulated mucus from the stomach is probably one of the reasons why taking soup at the beginning of a meal has been found so beneficial.

HOW LONG TO SLEEP.—Up to the fifteenth year most young people require ten hours, and till the twentieth year, nine hours. After that age every one finds out how much he or she requires, though, as a general rule, at least six to eight hours are necessary. Eight hours' sleep will prevent more nervous derangements in women than any medicine can cure. During growth there must be ample sleep if the brain is to develop to its full extent, and the more nervous, excitable or precocious a child is, the longer sleep should it get if its intellectual progress is not to come to a premature standstill, or its life be cut short at an early age.

THE FEELING OF NERVOUSNESS that comes over the bravest of men when at the top of a high structure, and impels them to leap down and destroy themselves, is now known as "acrophobia." The subject is attracting the attention of scientific men quite extensively, but there seems to be no very definite understanding of the cause of the disorder.

A NEW DISEASE, called photo-electric ophthalmia, is described as due to the continual action of the electric light on the eyes. The patient is wakened in the night by a severe pain around the eye, accompanied with excessive secretion of tears. An oculist of Cronstadt is said to have had 30 patients thus affected under his care in the last ten years.

USEFUL INFORMATION.

Producing Fire By Friction.

One of the first things which every child learns about fire is that certain savage races produce it by the rubbing of two sticks. Delightfully simple as the description of the process is, any one who has tried to perform the operation will certify that it is by no means an easy one, and very likely will afterward declare fervently upon oath that the thing cannot be done. Many travelers have tried under the most auspicious circumstances — in countries where the production of fire in this manner is in every-day use, with a grinning native to choose the weapons and give a practical exhibition of his own skill—and after many joint and muscle-aching experiments have given up the attempt in a state of mind bordering on temporary insanity.

"We ourselves," writes a traveler, "have been successful just often enough to understand the uncertainty of the operation. In the first place, judgment is required in choosing the sticks. The immense variety of tropic vegetation furnishes many sorts that answer the purpose, but many also that will not; and an expert sometimes may be long in finding two species suitable. One must be light and soft, the other heavy, of close texture, and both must be dry. Upon the heavy bit he cuts two grooves, in the form of a cross, fixes it tight—with his prehensile toes probably—sharpens the light bit, places it in the intersections of the cross, and twirls it steadily between his palms. Gradually tinder forms, in the shape of dust, which drops down the grooves in a tiny heap on either side. If the twirling be interrupted for a second, that represents so much waste of time, which must be recovered at enormous interest. If the heavy piece shifts, the tinder is displaced. One or other of these accidents account for the failure of the inexperienced, which is pretty certain to occur." As in all other operations of the kind, manual dexterity comes only after considerable practice. But the power of originating fire in this manner with facility is not an accomplishment possessed by every one, even in the countries where the practice exists. The inhabitants of the Tropics do not always depend wholly upon their two sticks; among many tribes they are nothing but a last resort. They have other methods of producing fire. A native carries in his "betel-box" perhaps a fragment of hard pottery and a morsel of dry fungus. Fixing a bit of the latter in the hollow of the former, and holding it down with the thumb—in such a way that it follows the edge—he smartly strikes his box, which is bamboo, of course, just as if he were handling flint and steel. The fungus-tinder is glowing in an instant.

A practice still more odd is used by some Oriental people. They carry a short stick of lead hollowed like a cup at one end, which they fill with tinder, and a small bamboo which closely fits it. Setting the stick upright in the left palm, they adjust the bamboo over it, strike smartly, withdraw it as quickly, and the tinder is alight.

The friction methods in use in different parts of the world are various. One of the simplest is with the stick and groove—a blunt-pointed stick being run along a groove of its own making in a piece of wood lying on the ground. In Tahiti Mr. Darwin saw a native produce fire in a few seconds, but only succeeded himself after much labor. This device is employed in New Zealand, the Sandwich islands, Tonga, Samoa, and the Radack islands. Instead of rubbing the movable stick backward and forward, other tribes make it rotate rapidly in a round hole in the stationary piece of wood, in the manner we referred to, thus making, as happily designated, a fire-drill. This device has been observed in Australia, Kamchatka, Sumatra, and the Carolines, among the Yeddahs of Ceylon, throughout a great part of South Africa, among the Esquimau and Indian tribes of North America, in the West Indies, in Central America, and as far south as the straits of Magellan. It was also employed by the ancient Mexicans, and Mr. Tylor gives a quaint picture of the operation from a Mexican MS., in which a man half kneeling on the ground is causing the stick to rotate between the palms of his hands.

This simple method of rotation seems to be very generally in use, but various devices have been resorted to for the purpose of diminishing the labor and hastening the result. The Gaucho of the pampas takes "an elastic stick about 18 inches long, presses one end to his breast and the other in the hole in a piece of wood, and then rapidly turns the curved part like a carpenter's center-bit." In other cases the rotation is effected by means of a cord or thong wound round the drill and pulled alternately by this end and that. In order to steady the drill the Esquimau and others put the upper end into a socket of ivory or bone, which they hold firmly in their mouth. A further advance was make by some North American Indians, who appear to have applied the principle of the bow-drill, and the still more ingenious pump-drill was used by the Iroquois Indians. For a full description of these instruments we must refer the reader to Mr. Tylor's valuable chapter in his "Researches."

These methods of producing fire are but rarely used in Europe, and only in connection with superstitious observances. We read in Wuttke that some time ago the authorities of a Mecklenberg village ordered a "wild fire" to be lighted against the murrain among the cattle. For two hours they strove vainly to obtain a spark, but the fault was not ascribed to the quality of the wood or to the dampness of the atmosphere, but to the stubbornness of an old lady, who, objecting to the superstition, would not put out her night light. Such a fire to be efficient, must burn alone. At last the strong-minded female was compelled to give in; fire was obtained, but of bad quality, for it did not stop the murrain.

A belief in the peculiar virtues of fire obtained by the friction of wood has at one time or another prevailed among all nations of Indo-European race, and not many years ago the obtaining of need (fire) was practiced in the Highlands of Scotland. One of its principal virtues has always been considered to be its efficiency against disease.—*The Fireman, London.*

LOTUS ROOTS PURIFY WATER.—*Indian Engineering* states that a large basket of the roots of the lotus has been received by the municipality of Bangalore from Tanjore, and is now being planted out in the beds of the tanks in the station. This aquatic plant is one of the best water purifiers known. It rapidly oxygenates the water, and, ridding it of its dead organic matter, brings it into a healthy condition. The presence of such like aquatic plants in reservoirs is said to diminish evaporation.

TO KEEP OFF MOSQUITOES.—Take a small quantity of a two per cent carbolic acid solution and sprinkle sheets, coverlets, pillow and bolster on both sides, the edges of bed curtains, and the wall next the bed. The face and neck may also be slightly wetted with the solution. Not a single gnat or mosquito, it is said, will come near.

FOR a cement for fastening wood to stone, melt together four pints of pitch and one pint of wax, and add four parts of pounded brick-dust or chalk. It must be warmed before using and applied thinly to the surfaces to be joined.

TO WRITE ON THE SKIN.—A Nuremburg manufacturer has invented pencils in blue, black and brown, for writing on the human skin. They are for use in anatomical and chemical demonstrations.

A COLD PLACE.—There is said to be a spot in Siberia about 30 miles square where the ground has not thawed out for the last hundred years, and where it is frozen to a depth of 60 feet.

ENGINEERING NOTES.

The Hydraulic Railway Impracticable.

A correspondent writing to the *Industries* gives the following reasons why the hydraulic railway, which has been attracting so much attention in Paris, is impracticable for ordinary railway work:

The question of first cost appears to me to be a more serious one in the case of the hydraulic railway than that of power. The rails could certainly not be made lighter, considering the bearing surface required, than ordinary rails for the same class of traffic; and it is a very moderate estimate to assume that the cost, weight for weight, would be doubled, owing to the fact of the rails being planed and jointed. Indeed, to supply the rails at double the present cost would only be possible on a large scale, and by the use of special appliances. To avoid excessive loss in the transmission of power through the water pipes, either the latter must be of a very large diameter or the pumping stations must be very close together. Either of these alternatives means a very heavy outlay. The installation, moreover, must be from the first designed to suit the maximum amount of traffic likely to occur, so that at first, and for an indefinite period, the plant would be much in excess of the requirements, and this would involve a great waste of capital. On an ordinary railway, increasing traffic can be met by proportionate additions to the rolling-stock and locomotives, receipts being more or less commensurate with capital expenditure. Probably the only way to mitigate the evil referred to on hydraulic railways would be to add to the number of pumping stations; but in almost all cases the evil would exist to a greater or less extent. A locomotive drawing a moderately heavy train is frequently called on to exert 500 h. p., often much more; and if it is assumed that on a hydraulic railway a train is of such a character that only 250 h. p. is required for its propulsion, that the available head of water is 1000 feet, and that the velocity of flow in the pipe is five feet per second, then the diameter of pipe necessary to transmit this power would be about 11 inches, on the assumption that the total efficiency is 60 per cent.

Under these conditions, only one train could be propelled at a time on each section of line between the pumping stations, and the loss of head in the pipes would be about 4.7 per cent per mile, or in two miles nearly ten per cent. If the efficiency of the turbine itself be taken at 70 per cent—an estimate which for a head of 1000 feet is too high—the extreme distance between two pumping stations must not exceed two miles. By using larger pipes, this distance could of course be increased; but then, with the assumed power, the amount of traffic possible would be reduced. With a given diameter of pipe and available head, the power which can be exerted over a certain length is strictly limited, if the efficiency is to be kept up to a definite standard. I have made the preceding calculations not on account of their absolute value, but merely to show approximately the conditions of the problem to be solved. The assumed head of 1000 feet is, I believe, greater than that which the promoters of the Girard-Barre scheme propose to adopt, and, as far as the diameter of pipes is concerned, more favorable. Where natural water-power is available in mountainous districts, the cost of the line would probably be quite as heavy as with pumping stations, since expensive reservoirs in elevated positions would be wanted for storage; and in addition to the pipes for transmission of power along the railway itself, mains would be necessary to bring the water from the reservoirs to the line. In special cases, for short lines with heavy traffic, the Girard-Barre system may be applicable; for ordinary railway work, and especially for long distances and light traffic, it is quite out of the question.

MORE WATER-WAYS NEEDED.—There is a great revival going on at home and abroad, regarding the value of canals and waterways as a means of transit for heavy commodities, such as coal and ore. The canal from the Allegheny to Lake Erie is a recent project, and likely to go through if one can judge from the efforts of the backers thereof. Governor Beaver says his idea is to make this canal a link in a grand chain of Interstate waterways from New York to New Orleans. This would be very feasible by widening the Erie Canal from Buffalo to Albany and putting in one or two additional dams in the Ohio. If this project is ever put through it will provide a route for navigation to the lakes and a pathway for King Coal to reach cheaply the market which is now most promising to him. If coal could be towed to the lake ports in the original packages as loaded in the Monongahela, it would certainly stimulate the trade of the whole of Western Pennsylvania, and even that of some parts of West Virginia. In the same line is the idea of slacking the Youghiogheny river, so that coke could be sent from the Connellsville district to many points via water, and then by taking short rail hauls, many of the places now reached "all rail" could be more easily attended to. The Youghiogheny has been slacked to West Newton, and could be slacked to Connellsville with comparatively greater ease.

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Business Announcements.

[NEW THIS ISSUE.]

Coal and Pig Iron—J. M[illegible]h & Co.
Real Estate—The Ev[illegible], Terry, Co[illegible]sen Brokerage Co., Butte, Montana.

See Advertising Columns.

Passing Events.

The heavy rains of the past week have reached all over the State, and in the higher mountains heavy snow-falls have been experienced. While occasioning some present inconvenience, the results will be beneficial, and the miners have all the water they want for some time to come.

The views advanced in his message by the President of the United States are regarded with disfavor by the silver miners; but these views, opposed as they are to those of the recent Silver Convention, bring the subject prominently before Congress and the people. Several bills were introduced the first day of the session, looking to the free coinage of silver, and doubtless favorable legislation will result.

The great fires at Lynn and Boston again bring forward the subject of fire-proof construction, and that at Minneapolis the subject of danger of high buildings. It seems impossible to construct a building which, in these great fires, is absolutely fire-proof. The big fires of Seattle, Spokane and Ellensburg on this coast were attributed to faulty construction of buildings and poor fire departments; but they had the best sort of structures in Boston, and the best fire department in the United States, with the same results.

The elevator process of gravel-mining is proving a great success at French Corral, Nevada county. The water and debris are raised perpendicularly a distance of 40 feet, and run off into settling reservoirs from which the water flows to the river in a comparatively clear state.

The President and Silver.

In his message to Congress, President Harrison touches on the silver question in such a way as to convey the impression that he either has no fixed views on the subject or else that he is trying to carry water on both shoulders so as not to give offense to either the monometallists or bimetallists belonging to his political party. He shows that of the total coinage ($343,638,001) from the monthly purchase of $2,000,000 worth of silver bullion, there was only remaining in the Treasury on Nov. 1st of this year the small sum of $6,219,577, which is neither in circulation nor against which certificates have not been issued.

With no fixed views, yet he has the following to say in favor of silver:

The evil anticipations which have accompanied the coinage and use of the silver dollar have not been realized. As a coin it has not had general use, and the public Treasury has been compelled to store it. But this is manifestly owing to the fact that its paper representative is more convenient. The general acceptance and use of silver certificates show that silver has not been otherwise discredited.

While admitting that the evil prognostications of the gold rings or monometallists have not been realized, yet he says:

I think it is clear that if we should make the coinage of silver at the present ratio free, we must expect that the difference in the bullion values of gold and silver dollars will be taken account of in commercial transactions, and I fear the same result would follow any considerable increase of the present rate of coinage.

Evidently the President is treading in the same path of the alarmists of 11 years ago who opposed the monthly purchasing and coining of silver to the extent of $2,000,000 as a minimum and $4,000,000 worth as a maximum. He unhesitatingly ignores the favorable results of the tests already made in the floating of nearly $350,000,000 in silver, and also the well-established fact that our currency is inadequate to meet our large and growing commercial wants. In attestation of the latter we cite the small amount of silver in the Treasury vaults that is not in use, as well as the following from the New York *Journal of Commerce* of Nov. 23d:

The Secretary of the Treasury has received a letter from the Merchants' Association of Boston, Mass., asking that the Secretary recommend to Congress the granting of a sufficient appropriation to secure an adequate supply of currency of convenient denominations at the Sub-Treasury in Boston. They do not ask an increase of the circulation, but desire small notes to be used in discharging their pay-rolls. There are several difficulties in the way of granting this request. First, the Treasury has only about eight millions of net silver dollars upon which small certificates could be issued. Second, whatever facilities may be granted at one sub-treasury must be granted to all. This would involve a large increase of the circulation. Third, to comply with this request would be a wide departure from the original plan of the independent treasury. These objections may be overruled by Congress, but until such additional legislation has been enacted the only way in which an adequate supply of small notes can be obtained is through the national banks at the Government rate for express charges.

And here is what the New York *Financial News* says:

Milton A. McRae, manager of the Cincinnati *Post* and St. Louis *Chronicle*, calls attention to the fact that Uncle Sam is backward in supplying the demand for the "penny." He says "there is a penny famine, and that although the Mint at Philadelphia is worked to its utmost capacity, the cry is, more." Here in Wall street we have been so pinched for dollars that we have not had time to think of pennies, but there is an urgent call for an increase of our currency. Our senators should remember we are a great growing country.

There are two other important facts that enter into the consideration of the subject. First, the gradual retirement of national bank-notes reduces the volume of currency, and they can, or at least should, only be replaced by silver certificates. This will take large sums of the latter. Second, the legal tenders issued in an emergency should now be made to give place to certificates based upon and redeemable in silver dollars, worth just 100 cents, receivable for taxes, duties and private debts. Knowing that upon demand the coin is forthcoming, no one will hesitate in accepting them at their face value. It is not a requisite that the silver bullion be coined immediately, for it could be placed in the Treasury vaults and coined at the discretion of the Treasury.

SENATORS STEWART and REAGAN have both introduced bills providing for the free coinage of silver.

Astronomical Society of the Pacific.

Another Medal Donated.

A meeting of the Astronomical Society of the Pacific was held at the hall of the California Academy of Sciences on Saturday last. In the unavoidable absence of the President, E. S. Holden, Vice-President Wm. M. Pierson occupied the chair.

Twenty-seven members were elected. Among the prominent names of the new members are to be found Miss Agnes Clerke, the author of "History of Astronomy," and Miss C. W. Bruce of New York City, to whom Harvard College Observatory is indebted for the funds for the Bruce Photographic Telescope. The total membership of the society now is 179.

A paper was read by Mr. A. D. Leuschner "On the Determination of the Relation Between the Exposure Time and the Consequent Blackening of the Photographic Film." This paper dealt with an investigation of a plate upon which a number of standard squares had been impressed by the Standard Lamp of the Lick Observatory. These squares had been given exposures of one second, two seconds, four seconds, eight seconds and 12⅝ seconds. These squares were then compared with each other and with a standard square by means of the wheel photometer of the Lick Observatory. Every precaution was taken to eliminate errors of observation in the comparisons.

An extended series of observations showed that the density was proportional to the time only between the exposures 2 seconds and 8 seconds, and with an approximation up to 64 seconds; beyond this the density was not proportional to the time. Mr. Leuschner also found that squares of the same exposure time on different parts of the same plate were not equal in density; due, doubtless, to the unequal distribution of the emulsion on the plate, and therefore the above results were derived from comparisons with the deduced mean of four squares in each case.

The principal paper of the evening was read by Mr. Barnard on some photographs of the Milky Way, the Andromeda Nebula, etc., that he had made with a large portrait lens of 6 inches aperture and .31 inches focus. This was strapped on the tube of the 6½-inch equatorial of the Lick Observatory, the clock-work of that instrument being controlled by hand with the slow motion rods at the eye-end. A star was kept bisected by the cross-wires in a high-power eye-piece on the 6½ inch itself. The additional weight of the camera made it necessary to constantly correct the clock throughout the exposures.

With this instrument a negative of the Pleiades was made on August 23d of this year, an exposure of 1h. 15m. being given. This showed the Merope Nebula conspicuously, the sharp prong of nebulosity from Electra, and some of the nebulosity about Maia and Alcyone. A negative of the Milky Way (17h. 57m. 18 9°) was made July 28th with an exposure of 2h. 35m., and another of the Milky Way (17h. 56m. 28°) on August 1st, with an exposure of 3h. 7m., and a negative of the Great Nebula of Andromeda on August 26th, with 4h. 18m. exposure.

The paper was illustrated by lantern slides from these plates. These were projected on a large screen by the oxy-hydrogen light. The nebulosities of the Pleiades were very conspicuous to the audience, and the beautiful cloud forms of the Milky Way, with the myriads of stars into which they were partially revolved, were exquisitely shown. (One of these slides is reproduced in this number of the PRESS.) The slide of the Great Nebula of Andromeda, when first projected on the screen had a mask over it with a small hole representing (to scale) the largest field of the great telescope on Mt. Hamilton; this was moved about over the slide showing successive fields of view over and around the Great Nebula. Only a small portion of the nebula could be seen at once; the mask was then suddenly removed and the entire nebula, suspended amid countless stars, flashed into view. The contrast between the limited space representing the field of the great telescope, and the sky as shown by the photographic lens, was startling in the extreme. This slide showed the great nebulous rings that were first proved to exist by Roberts. Mr. Barnard has estimated by carefully counting areas, that the original negative of the Andromeda Nebula—8x10 inches—contains 64,000 stars that can be distinctly counted. This entire plate had been reduced to a lantern slide, which brought out peculiarities of arrangement in the stars that were not suspected in the original negative. In all of these photographs the stars were perfectly round.

Mr. Leuschner also read a paper on the Orbit of Swift's New Comet, which he had completed from observations by Mr. Barnard at the Lick Observatory on Nov. 20th, 21st and 22d. He called attention to the small inclination and to the perihelion distance which were suggestive of periodicity.

After the papers had been read, Chairman Pierson announced another gift to the society of $2500, free of all conditions. This is the generous gift of Alexander Montgomery, Esq., who is a life member of the society. It has been suggested that this donation be used in establishing a permanent fund for a gold medal to be given annually for the best paper read before the society. If this is carried out, it will be the second medal of the society, Mr. Joseph A. Donahoe having established a perpetual fund for a medal for the discovery of comets after January 1, 1890.

Patio vs. Pan Amalgamation.

We recently had the pleasure of meeting a gentleman who has had an extended experience with Mexican mines and reduction works. In the course of conversation the question was asked: "How do the percentages of extraction by the patio process compare with those of pan amalgamation?" As this question has often been asked, and never, to our knowledge, definitely answered, the figures given by our informant will be of interest.

It seems that some little time ago the question of these percentages was raised between a Mexican, managing a patio, and the manager of a panmill. To settle the question, a sample lot of 50 tons was sent to the mill and an equal amount of the same character of ore worked on the patio. The *bullion* returns showed that on the patio there was saved 98 per cent of the silver and 30 per cent of the gold. In the mill 96 9-10 per cent of the silver and 90 6-10 per cent of the gold was saved.

On the patio 55.2 ounces of quicksilver were consumed per ton of ore worked, whereas in the mill the consumption was only 4 36 100 ounces. The amount of chemicals used was the same in both cases.

A general impression prevails that the Mexicans can work ore in the patio much closer than we can in the pans. In this instance the Mexicans themselves worked by the patio process, while an American attended to the pan amalgamation, so both parties were working "with their own tools," and trying to do their best. Aside from the other percentages, the difference in loss of quicksilver is quite remarkable, the American losing less than half a pound per ton of ore, while the Mexicans lost 3½ pounds.

Academy of Sciences.

At the meeting of the Academy of Sciences held on Monday evening, Dr. H. W. Harkness presided; a number of books were reported as having been added to the library by purchase and donation.

The following donations were made to the cabinet: One specimen Echinis remora (Linn.), found attached to a shark near the Sandwich islands, donated by Dr. E. S. Clark; one specimen of early stage of some Selachianoid fish, probably a ray, found in Sitka bay, Alaska, donated by Jerome B. Cox; a piece of vein matter forming a distinct cross, from a mine near San Andreas, Calaveras county, donated by Melville Attwood; collection of beetles, containing 1421 specimens of about 200 species, collected mostly in the vicinity of Oakland, the collection containing many interesting and rare specimens, donated by F. C. Torry; four skins of young auk and four sea birds' eggs (unidentified), from Alaska, donated by Mrs. W. J. Dodd.

The paper of the evening was read by the author, Vice-President H. H. Behr, entitled "The Economy of Nature as Exemplified by Vegetable and Animal Parasites."

IT seems rather unjust, after the Union Iron Works of this city have produced so fine and speedy a ship as the Charleston, that they must forfeit $33,384 penalty for lack of specified horse-power, and $3500 for delay in completion.

Relieving Tuyeres of Slag.

In the PRESS of last week cuts were shown of a three-inch tuyere slagging-valve, used at the Warwick furnace, as described by Mr. Edgar S. Cook of Patterson, Pa., before the American Institute of Mining Engineers. The cuts on this page show the large, or six inch, slagging-valve.

Flushing can be done through the tuyere slagging-valves with the same facility as through the cinder-notch. It occasionally happens, even in a furnace working well, that a pocket forms under or around a certain tuyere, so that when the engine is stopped, this tuyere is sure to fill with slag. When this condition is known to exist, it is only necessary to throw the blast off the furnace, open the valve of the tuyere, and put the blast on again blowing slag out and then stop the engine.

In addition to the uses mentioned in the PRESS last week, it is found that the tuyere slagging-valves supersede the "pricking" of the tuyeres, and answer the purpose far better. A pricking rod is now used only when a large, hard lump obstructs the nose of a tuyere, which rarely happens. In order to keep the valves in good working order, it was the custom to open them regularly once or twice per turn. In so doing, it was noticed that the tuyeres kept cleaner and brighter than heretofore. Besides, they never before made so much iron in the same time. A clean, bright tuyere will certainly melt more material per hour than one furred with dirt. The frequent opening of the slagging-valves removes the dirt deposited in the belly-pipes from the gas and the infusible dirt that collects around the nose of each tuyere.

In the form of six-inch valves shown in Figs. 5, 6 and 7, it will be seen that the valve *V* replaces the ordinary swinging cap, and carries the eye-hole *M* and the pricker-hole *W*, the latter being closed by means of a full-way valve, instead of lever and ball. This valve is located on the front tuyere, directly over the iron notch, and is made to replace the ordinary cap, the eyesight and pricking-rod holes being in the valve. It can be easily opened to change nozzles. It is safer to operate a valve of this size independently of the others. Its cylinder is connected to the blast-pipe by a separate one-inch pipe.

It is considered that the six-inch valve would be of more value than the three-inch one, chiefly in extreme instances of the chilling of the crucible and a large accumulation of dry ore-dirt in the furnace. As now constructed, the three-inch tuyere slagging-valve can be placed in position in about five minutes, everything being got ready before the stoppage of the furnace after a cast. A circular casting, about 11 inches long, of the same internal and external diameter as the elbow-casting of the belly-pipe, is keyed to the elbow in place of the cap, the cap being transferred to the opposite end of the valve-casting. In other words, the ordinary elbow is lengthened by a separate casting 11 inches long. The air-cylinder is permanently attached to this circular casting, carrying the sector and the rack-extension of the piston-rod operating the valve, the valve itself being on the lower side of the casting. The seat of the valve is made detachable, so that it can be renewed should it become worn or cut by the action of the slag.

Recently they allowed considerable slag to accumulate in the furnace. By simply operating the three-way cock of the six-inch slagging-valve, they flushed through the belly-pipe and valve without any injury either to the pipe or valve. A very slight shell of chilled slag remained in the pipe. The valve was closed easily and tightly by reversing the cock.

On another occasion, shortly before the regular time for flushing, the engine suddenly stopped, in spite of the efforts of the engineer to keep it moving. A joint in the steam-pipe had



THE "SURE GRIP" TACKLE-BLOCK.

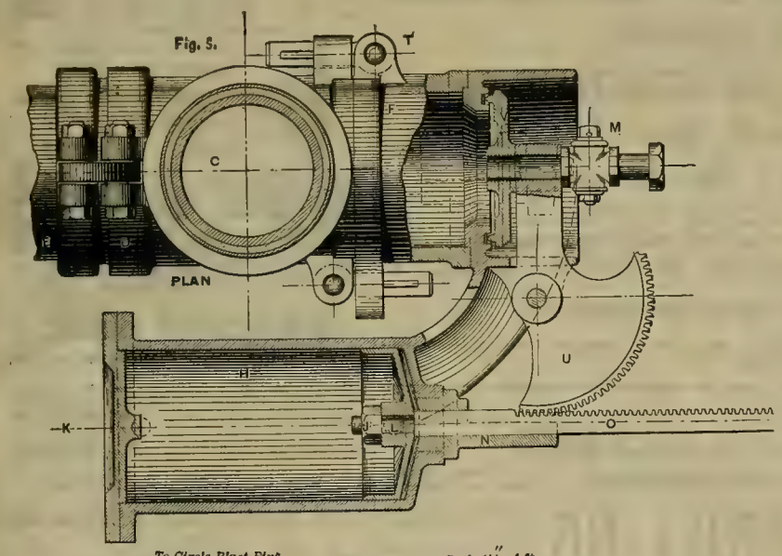
slag in the pipe, draining itself and also the adjoining pipe, the only one on which they had not placed a slagging-valve. The three-inch valves were opened as quickly as possible by the keeper, by means of a small bar, no air-pressure being in the pipes. From each, the slag flowed without difficulty. The delay in opening the three-inch valves caused a more or less heavy shell to form in the pipes, in contract with the six-inch valve, which opened of itself and left but a light shell in its belly-pipe. In half an hour's time all the pipes were perfectly cleaned and they started up again. But for the slagging-valves, the pipes would all have been completely filled with slag, which would have solidified before it would have been possible to remove it by means of the ordinary swinging caps, thus entailing a stoppage of four or five hours. Such a long stoppage, coming unexpectedly, might, under some conditions, cause much trouble and additional expense.

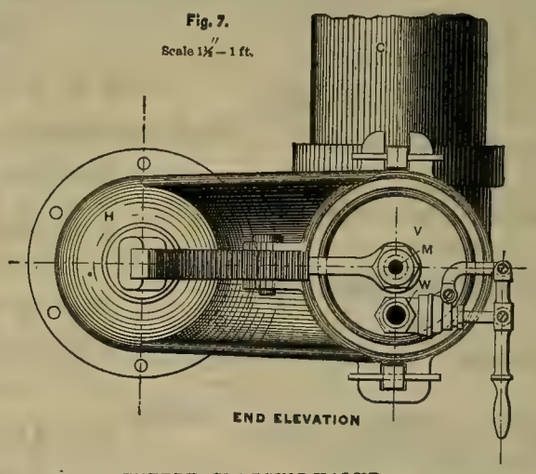
An Improved Tackle-Block.

A cut given herewith shows the Detroit "Sure Grip" steel tackle-block, which will hold the load at any point without backward slip, thus enabling a man to hoist with less than the usual exertion. It is not a chain tackle, an ordinary rope being used. There is a wedge-shaped brake in the upper portion of the block. The two center ropes running in contact with the wedge, always travel in the same direction at the same time. The brake thus has a double grip and is positive and automatic. Its efficiency increases in direct proportion to the increase of load; at the same time it is susceptible of being disengaged by very slight pressure, the cord and lever controlling it. This device is very desirable when it is of advantage to hold a load suspended for a time. The Parke & Lacy Co. are agents for this coast.

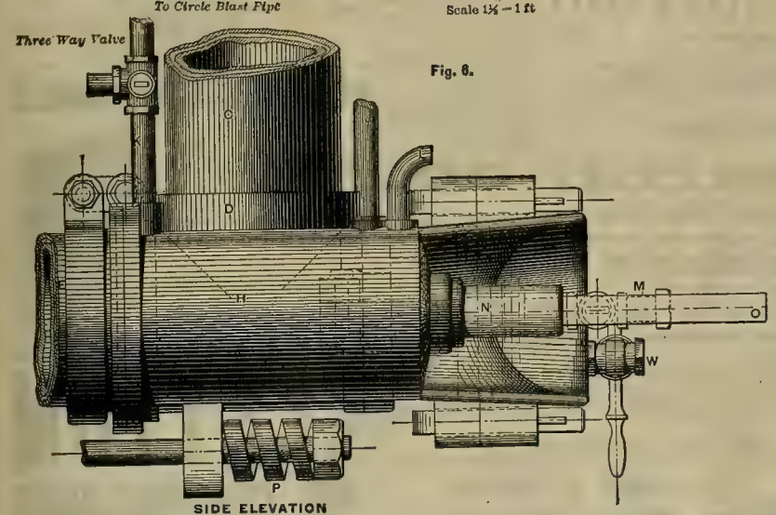
The "Milky Way."

In the present number we reproduce a portion of a negative taken at the Lick Observatory by Mr. E. E. Barnard on July 24th last. It shows a portion of the Milky Way in the constellation Sagittarius; right ascension 18h. 10m.; declination—20°. For this we are indebted to the courtesy of Mr. Chas. Burck.





TUYERE SLAGGING-VALVE.



SIX-INCH TUYERE SLAGGING-VALVE FOR FURNACES.



A PORTION OF THE MILKY WAY.

appears in this issue. The lantern slide (3¼x 4¼) contains less than a quarter the area of the original plate, and therefore covers about four square degrees in the sky. In this area the original plate shows about 4000 stars, none of which are brighter than the fourth magnitude. It is unnecessary to add that all the fainter stars have been unavoidably lost in the processes necessary to produce the cut, but the chart as rendered is interesting not only as showing the curious arrangement of the stars in space, but especially as exhibiting the general character of the maps obtained by means of photography. The least negligence of the observer (during the whole three hours of exposure) in watching the performance of the clockwork which was driving the equatorial to which the camera was attached would have ruined the sharpness of the picture, yet it can be seen that all the star images are perfectly round and distinct. During the whole time Mr. Barnard's eye was literally "glued to the telescope," and the slightest irregularity in the motion was immediately corrected by means of the slow-motion screws.

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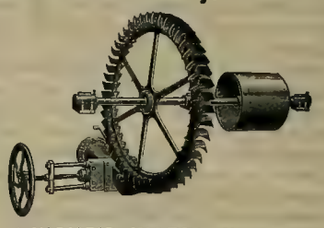
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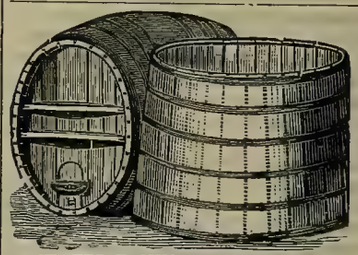
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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific States.

FOR WEEK ENDING NOV 29, 1889

416,028.—MATCH-MAKING MACHINE.—W. Bend, Portland, Or.

415,812.—WAVE-POWER.—A. W. Dow, S. F.

415,969.—CONCENTRATOR.—Geo. Gates, Drytown Cal.

416,000.—SAFETY DEVICE FOR ELEVATORS.—John Hatch, S. F.

416,112.—SAFETY DEVICE FOR ELEVATORS.—E. Lamoree, S. F.

416,004.—ADJUSTABLE WINDOW SASH.—Chas. Megow, S. F.

415,978.—CARBURETOR FOR GAS ENGINES.—D. S. Regan, S. F.

416,017.—DIE FOR MAKING ENGINE SPRING ENDS.—Geo. H. Smith, Sacramento, Cal.

415,800.—GANG PLOW.—H. Squire, Stockton, Cal.

416,021.—CONCENTRATOR.—C. H. Voll, S. F.

415,934.—SHIPPING-BOOK.—G. H. Wheeler, Tacoma, Wash.

17,218.—TRADEMARK.—Crocker & Co., S. F.

The following brief list by telegraph, for Dec. 3, will appear more complete on receipt of mail advices:

California—H. G. Blasdell, Oakland, ore-concentrator belt; F. Ellis, San Francisco, gas governor; J. W. Gentry, assignor of two-thirds interest to G. A. Loring and W. H. Terry, Oakland, cable grip; William Grath, San Francisco, stamp-canceling and post-marking machine; W. W. Hanscom, deceased, A. P. Hanscom, executrix, San Francisco, air-brake and relief-valve; Abel Henning, Oakland, assignor of one-half to A. M. Bolt, Alameda, and T. F. Lint, San Juan, oil-gas apparatus; H. P. Holland, San Francisco, ore concentrator; B. Holt, Stockton, feeding mechanism for harvester and thrasher; T. J. Hubbell, assignor of one-half interest to W. H. Wolf, Santa Clara, universal ladder; N. S. Keith, San Francisco, regulator for electric motors; W. N. Laufenberg, Stockton, grain-separator and cleaner; R. G. Longherry, San Francisco, address tag; J. D. Morgan, Ventura, agricultural machine; J. H. Scott and S. Nelson, San Francisco, collar-fastener; C. S. Webber, San Jose, stringing pianos; A. A. Wentworth, Merced, necktie fastener.

Oregon—J. B. Irvin, Sparta, ore concentrator.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast Inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

DIE FOR MAKING ENGINE SPRING ENDS.—George H. Smith, Sacramento. No. 416,017. Dated Nov. 26, 1889. The invention relates to the making of the ends of locomotive springs so as to connect them with what are known as the "spring hangers." It consists in a means for forming suitable lugs upon the ends of the back or main leaf and in shaping and slotting these ends. The long or first leaf of the spring is called the "main" or "back leaf," and in order to connect two or more pairs of springs with equalizing levers, so as to distribute the strain through both springs, it is necessary to connect the spring with the equalizing levers by means of links, and in order to retain the links in place and prevent their slipping upon the spring, the ends of the main leaves of the springs are provided with lugs which engage the links and hold them in place. These ends are of three kinds, two of them having half-round or concave bearings, one being slotted and the other solid, and the third being what is known as a "flat bearing." This invention is designed to form these ends.

CONCENTRATOR.—George Gates, Drytown, Amador county. No. 415 999. Dated Nov. 26, 1889. This is one of that class of machines for concentrating ores in which the separation takes place upon a concentrating table to which is given a jarring movement. The table has its surface divided into a number of independent inclined parallel runs or channels, and having a jarring motion at right angles to the flow of material. The feeder is at right angles to the table, with passages of regularly increasing lengths, by which the material is directed into the runs or channels in the table. There are perforated water-pipes on the same side of said runs or channels for discharging water into them.

CARBURETOR FOR GAS ENGINES.—Daniel S. Regan, S. F., assignor to himself and Sanford S. Bennett of Alameda. No. 415,978. Dated Nov. 26, 1889. This improved carburetor is designed specially for use in connection with an explosive-vapor engine. The object of the invention is to provide a device for charging atmospheric air with the vapor of a light hydrocarbon liquid, and transmitting this vapor directly to the engine cylinder, within which it is ignited and exploded so as to propel the piston of the cylinder, said piston acting as a pump during alternate strokes, by which a sufficient quantity of air is drawn into the carburetor by the vacuum produced by the movement of the engine-piston to form a single charge for the engine, the carburetor ceasing to act immediately upon the stopping of the engine.

ORE CONCENTRATOR.—Chas. H. Voll, S. F. No. 416,021. Dated Nov. 26, 1889. The invention relates to one of that class of ore-concentrators in which an endless traveling table is employed, and it relates specially to that subclass in which the concentrating table consists of a blanket carried by an endless traveling bed. The patent covers a number of details, the main thing being the endless traveling bed for supporting and carrying the blanket, composed of rigid, separated or spaced slats, having enlarged heads or ends with inclined inner surfaces for inclining the sides of the blanket, said heads or ends being connected by pivoted links and having notches in their bases, sprocket-wheels engaging the notches to drive the bed.

SAFETY DEVICE FOR ELEVATORS.—John Hatch, S. F. No. 416,000. Dated Nov. 26, 1889. This safety device is designed to gradually stop the movement of the elevator car upon the breakage of the suspending cable. The inventor provides clamping-shoes which serve to guide the cage and prevent it from swinging from side to side in the guides, and which are connected with an automatic mechanism on the cage or car. In case the cable breaks, these clamping-shoes grasp the opposite edges of the guide-timbers in such a way that there is no tendency to separate or spread these guide-timbers. The heavy weight or pressure of the clamping-shoes on the guides will be such as to gradually check the motion of the cage and finally stop it.

ADJUSTABLE WINDOW SASH.—Chas. Megow, S. F., assignor of one-half to John L. Anderson. No. 416,004. Dated Nov. 26, 1889. This invention relates to that class of window-sashes which are pivoted at their sides, whereby they are adapted to be reversed to permit ready and easy access to them from the inside for the purpose of washing them; and the invention relates particularly to that class of these pivotally-adjustable sashes in which the inside and outside beads and the intervening parting strips are themselves pivoted, so as to adapt them to be thrown backwardly in the window-casing or frame, thereby freeing the sashes. The object is to provide a simple and easily operated window, the sashes of which can be readily reversed to permit them to be reached.

The Power of Niagara Falls.

To be Utilized by a California Invention.

The famous Niagara Falls, it is estimated, would, if fully utilized, afford all the way from ten to fifteen million horse-power—probably enough to run all the machinery in the New England States. The magnitude of the undertaking, as well as the fact that no water-wheel has ever been found adapted to such conditions, has heretofore discouraged any attempts to make use of this stupendous power. Turbine wheels, it is well known, cannot be operated under any such head as these falls afford, their usefulness being limited to heads ranging from 10 to 30 and 40 feet, and as there are many other streams from which this much fall can be obtained, that do not present such difficulties of application, the great wealth of energy Niagara affords has been allowed to run to waste.

The remarkable results obtained from the Pelton wheel on the Pacific Coast has attracted the attention of many of our most eminent engineers with reference to its application to the falls above referred to, and an examination of the extraordinary conditions under which many of them are being successfully operated clearly indicates their adaptation to such purpose. The means of utilization being thus determined, the problem presents no insurmountable difficulties.

A commission from the Canadian authorities, consisting of a member of Parliament and several noted engineers, recently visited the Pacific Coast to investigate the merits of this wheel with reference to its adoption in various enterprises projected in the Provinces, but more particularly for purpose of utilizing the water-power of Niagara Falls from the Canadian side. The result of the investigation was satisfactory in the highest degree, and will undoubtedly result in the first attempt to make this gigantic force available for manufacturing and commercial purposes. The members of the Commission were of the unanimous opinion that by means of Pelton wheels it is practicable to utilize to a very considerable extent the energy these falls afford, and that the project, stupendous as it is, involves no greater engineering difficulties than are encountered in many of the great enterprises now under construction in various parts of the world.

The hight of Niagara Falls is 164 feet. By piping water a distance of about three-quarters of a mile to a point below the rapids, a fall of 240 feet can be obtained. This entire fall it is proposed to utilize, placing the wheels above high-water mark along the bank of the river and locating various manufactories on accessible sites above, the power from the wheels to be carried up by a system of cable transmission. Anywhere from 100,000 to 500,000 horse-power can, it is estimated, be obtained in this way without any appreciable loss in the current which sweeps along with such irresistible force.

In addition to local manufactories, dynamos will be run to supply power and light to the adjacent towns and cities, as also to transmit electrical energy for power and light to the cities of Buffalo and Toronto, which are only about twenty miles distant.

The project, though one of great magnitude, is now believed with the means at hand to be perfectly practicable, and the utilization of these great falls, about which there has been more discussion than any other problem of modern times, seems about to be realized.

Mining Personals.

John Palmer, formerly superintendent of the Grover and Bunker Hill mines, Amador county, is now superintendent of a mine in Kern county called the Glen Olive. It is situated from 8000 to 9000 feet above sea level, and 18 miles from a postoffice. The ledge is am l—two feet wide—and the rock is worked by two arastras, crushing about three tons per day. The rock yields from $40 to $60 per ton. Everything freezes during the winter, so as to prevent the running of the arastras.

Mr. Woodbury returned to Sonora from the New Albany mine a few days ago, where he has been superintending the erection of two Woodbury concentrators. The mill is now steadily in operation.

E. W. Roberts of this city has been examining mining properties in Tuolumne county.

E. C. Van Blarcom, who is operating a mill on the Bosse system at Pachuca, Mexico, is back in San Francisco on an enforced vacation. Mr. Van Blarcom had the misfortune to have his hand injured while at work at the mill, and has had to have one finger amputated. He will be here a couple of weeks and then return to Mexico.

R. A. Penrose, Assistant State Geologist of the State of Arkansas, is engaged in inspecting the manganese ore deposit found on the headwaters of Mark West creek, not far from Santa Rosa.

Mr. J. J. Smith, the successful manager of the Golden Monarch Mining Company, with basis of operations at Clear Creek, Baker county, Oregon, and who is also manager of the Milwaukee Mining Company, with mines located in Shoshone county, Idaho, has gone to Milwaukee to lay before his company the importance of having more extensive milling machinery on the Golden Monarch mine. At present they are working five stamps with very satisfactory results, but with the addition of five or ten stamps more they would then be able to not only mill their own ore but do custom work, a very important item. Another object of Mr. Smith's visit East is to place with Eastern capitalists a tract of placer ground, consisting of 200 acres, situated in Granite mining district, Oregon, one of the richest placer gold diggings on the coast.

The Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

	Cash.	Debt.
Alta	$ 39,646	$.....
Alpha	13,573	.....
Andes	14,942	.....
Bodie Con	12,140	.....
Benton Con	91,864	.....
Belcher	.....	889
Belle Isle	.....	4,896
Best & Belcher	4,356	.....
Bulwer	17,518	.....
Bullion	3,742	.....
Challenge Con	3 119	.....
Caledonia	8,460	.....
Chollar	.....	†2,539
Con. Cal. & Virginia	†214,125	.....
Confidence	1,741	.....
Con. Imperial	.....	9,448
Con. New York	826	.....
Commonwealth	.....	45,770
Crocker	.....	†7,490
Crown Point	.....	1725
Del Monte	.....	18,362
Diana	3 925	.....
East Sierra Nevada	7,508	.....
Exchequer	3.663	.....
Gould & Curry	22,065	.....
Grand Prize	.....	55,832
Hale & Norcross	14,339	.....
Holmes	.....	5,585
Independence	433	.....
Julia	9,432	.....
Justice	11,080	.....
Kentuck	429	.....
Lady Washington	20,322	.....
Locomotive	2,354	.....
North Belle Isle	.....	14,630
North Commonwealth	.....	13,497
Mexican	3,479	.....
Mono	14,072	.....
Navajo	.....	11,898
Nevada Queen	.....	11,648
Occidental	.....	†4 302
Ophir	14,007	.....
Overman	12,329	.....
Peer	9,074	.....
Peerless	6 628	.....
Potosi	12,126	.....
Savage	.....	†32,237
Scorpion	8,231	.....
Seg. Belcher & Mides	.....	4,097
Silver Hill	18 252	.....
Sierra Nevada	38.542	.....
Silver King	4,452	.....
Standard	.....	†4,671
St Louis	582	.....
Syndicate	7,793	.....
Union Con	14,508	.....
Utah	19,216	.....
Weldon	4,640	.....

*With $25 000 in concentrates.
†Unsold bullion to hear from.
‡Unsold bullion $70,246 and further shipments to hear from.

MINERS AND SALOONS.—A correspondent of the Redding *Free Press*, from Custer, Idaho, says: "Nearly all the mines about Custer are shutting down, and the men right in the beginning of winter are forced to leave and hunt new jobs. Many of them I have seen carrying their blankets out on their backs, and that, too, after they have worked, perhaps, six months at $2 50 a day net. They ought to have money, but they have not. The ten saloons of this little place of 200 inhabitants, and the numerous well-fed gamblers, tells the tale of the honest workingman's foolishness."

Ticket-Holder for Piece Goods.

Samuel Bauman of Santa Cruz has patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, a device for marking goods in dry-goods stores, such as are known as piece goods. He terms the device a ticket-holder, and it consists of a plate folded to fit the end of the board on which the goods are rolled, and having a slot in which the ticket or card may be slipped. The device is shown in a cut on this page.

What are known as piece goods are usually rolled upon boards, and being laid upon the shelf with the ends presented to the front, it is difficult to properly mark the goods so that their price, number, etc., may be seen at a glance. The plate devised by Mr. Bauman has its sides triangular in shape and folded so as to just slip over the end of the board on which the goods are to be rolled. The plate is secured to the board by spurs which engage with the wood. At the point where the plate is folded over the end of the board, slots are made, forming tongues which are raised from the surface of the end of the plate so as to admit the ticket or slip upon which the necessary figures and words are printed. The ticket slips into the space beneath the strips. Upon these slips are printed the matter that is necessary to identify the goods, giving number, price-mark, etc., and the slips are easily introduced and removed at will. When the goods lie upon the shelves these slips are permanently exposed, so that they can be easily read at a glance. The plate also prevents the end of the board from splitting.

Assessment Notices.

Booth Gold Mining Company. Location of principal place of business, San Francisco, California. Location of Works, Auburn, Placer Co., Cal.

NOTICE is hereby given that, at a meeting of the Board of Directors, held on the 23d day of November, 1889, an Assessment, No. 4, of Two(2) Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin, to the Secretary, at the office of the Company, No. 310 Pine Street, Room No. 23, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of December, 1889, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the 20th day of January, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

GEO. R. SPINNEY, Secretary,

Office, No. 310 Pine Street, Room No. 23, San Francisco, California.

DELINQUENT SALE NOTICE.

Gray Eagle Mining Company, Location and principal place of business, San Francisco, California. Location of Works, Placer Co., Cal.

NOTICE.—There are delinquent upon the following described Stock, on account of Assessment (No. 15), levied on the 16th day of October, 1889, the several amounts set opposite the names of the respective Shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
Brown, G. A	463	100	$ 6 00
" G. A., Trustee	464	5,000	300 00
" " "	465	2,500	150 00
Bogart, O. H., Trustee	414	500	30 00
" " "	428	100	6 00
" " "	430	100	6 00
" " "	431	100	6 00
" " "	432	100	6 00
" " "	433	100	6 00
" " "	435	50	3 00
" " "	436	100	6 00
" " "	447	5,000	300 00
" " "	470	1,000	60 00
" " "	484	200	12 00
" " "	485	200	12 00
Colton, A. O., Trustee	243	100	6 00
" " "	244	100	6 00
Carnes, W. A	254	416	24 96
Chase, Q. A., Trustee	419	3,814	228 84
Deming, T. G., Trustee	440	660	36 40
Ettlinger Isaac	137	600	36 00
Field W. A	403	100	6 00
Francis, H. L. Trustee	444	1,500	90 00
Gray, H. W., Trustee	446	200	12 00
Horton, Thos. R., Trustee	315	5,000	300 00
Hersey, C. S	95	2 0	12 00
Hall, Wm. E	131	900	54 00
" "	154	1,000	60 00
Hall, Wm. E., Trustee	411	200	12 00
" " "	412	200	12 00
Nash, H. W	269	104	6 24
Rockrohs H M	30	600	36 00
Riordan, Thos D	491	12	72
" Thos. D., Trustee	415	500	30 00
" " "	416	500	30 00
" " "	417	500	30 00
" " "	418	500	30 00
" " "	492	500	30 00
Stout, C. S	486	100	6 00
" " Trustee	422	106	6 36
" " "	476	2,000	120 00
Scarles, W. A., Trustee	129	250	15 00
" " "	322	250	15 00
" " "	429	1,040	62 40
Shankland, Robt	144	600	36 00
" "	173	400	24 00
Taylor, J. N	102	1,000	60 00
" "	330	40	2 40
Waller, L. P. F., Trustee	358	100	6 00
" " "	367	3,000	180 00
" " "	458	100	6 00
" " "	459	100	6 00
" " "	460	100	6 00
Winn, A. H., Trustee	466	1,000	60 00
Wetzel, Theo, Trustee	337	40	2 40
" " "	360	1,000	60 00

And in accordance with law, and an order of the Board of Directors, made on the 16th day of October, 1889, so many shares of each parcel of such Stock as may be necessary, will be sold at public Auction, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California, on TUESDAY, THE TENTH (10th) DAY OF DECEMBER, 1889, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

J. M. BUFFINGTON, Secretary.

Office, Room 11, No. 303 California St., San Francisco, California.

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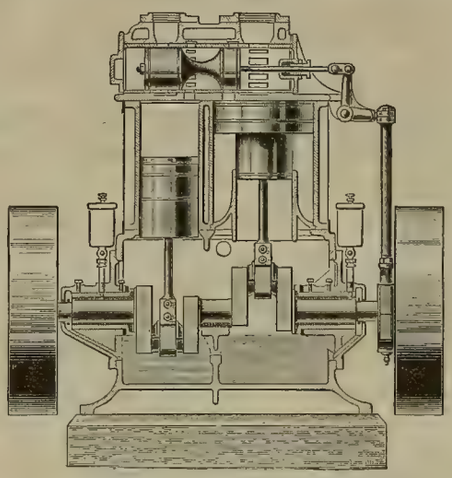
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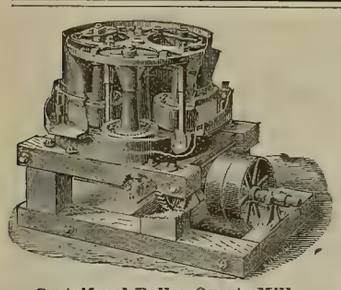
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California Inventors

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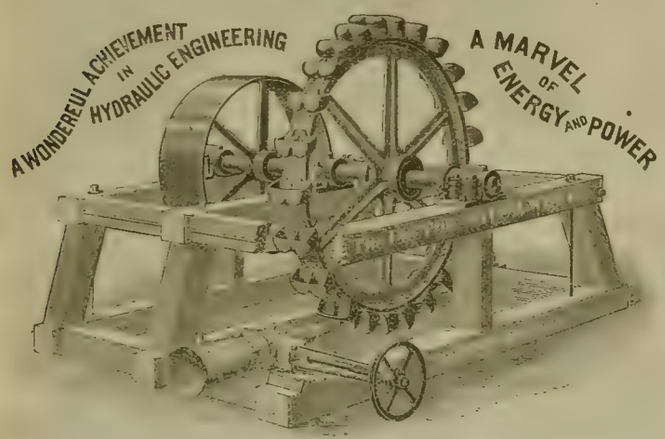
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Affords the Most Simple and Reliable Power for all Mining and Manufacturing Machinery.

Adapted to heads running from 20 up to 2,000 feet.

From 12 to 20 per cent better results guaranteed than can be produced from any other Wheel in the Country.

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Power from these Wheels can be transmitted long distances with small loss, and is now extensively used in all parts of the country for generating both power and light.

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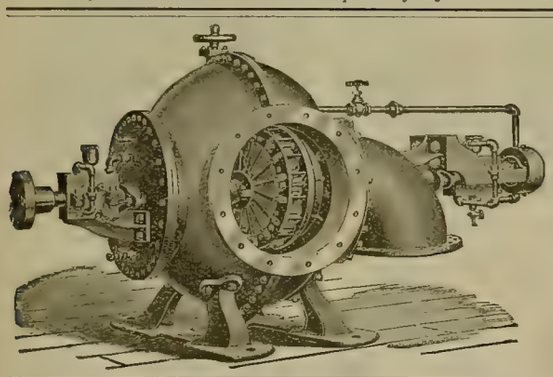
Should state amount, and head of water, power required, and for what purpose; with approximate length of pipe; also, whether the application is with reference to *Wheels* or *Motors* described below. SEND FOR CIRCULARS.

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PELTON WATER MOTORS.

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JAMES LEFFEL'S Mining Turbine Water Wheel.

These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

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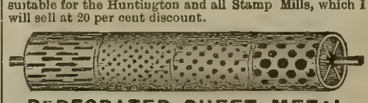
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Dec. 5, 1889.

General trade for the season continues fair. As usual, as the year draws toward a close, more apathy is felt in all lines, owing to the desire of merchants to close up their yearly business. The money market is easy, with no particular call from any quarter for accommodations. The reserves in banks are not only large but increasing. Much of this no doubt is being drawn together for disbursement next month on interest and dividend accounts. Remittances from the interior are fair.

The steamer City Rio de Janeiro, hence Dec. 3d for China, took out the following treasury shipment:

Mexican Dollars	$369,928
Gold Coin	21,190
Gold Dust	2,808
Silver Bullion	448,500
Total	$842,426

The bank shipments were as follows: To Japan, by the Anglo-Californian Bank, silver bullion, $48,500; by the Hongkong & Shanghai Banking Corporation, silver bullion $400,000, Mexican dollars, $44,000. To Hongkong or Yokohama, by the Anglo-Californian Bank, Mexican dollars, $57,000. To Hongkong, by the Bank of California, Mexican dollars, $150,000; by Wells, Fargo & Co.'s Bank, gold-dust, $2000. The balance was shipped by Chinese.

MEXICAN DOLLARS—The demand the past week was fairly active for shipment to China; prices ranged from 77⅝@78c., closing at about 77½@77¾c.

SILVER—The market held steady at 97@97¼c. up to Monday, when 97½c. was bid and 97¾c. paid for immediate delivery; but yesterday the market was irregular at 96½@97c. The advance was in sympathy with higher prices abroad, owing to a freer demand. The decline was due to the President's ambiguous, unsatisfactory and straddling attitude toward silver. It is very generally conceded that the set-back is only temporary, for Congress will undoubtedly pass some kind of an Act that will give more protection to this leading industry. What it will be no one at present has any fixed opinion, but that relief will be afforded is admitted by all. The proposition of the Secretary of the Treasury to allow the free depositing of bullion at the mints and the issuance of certificates against it at the market value up to one dollar an ounce, fine, and making the certificates redeemable either in gold or silver coin, will unquestionably find advocates with a large class. This, or a similar kind of compromise, with proper safeguards, may be passed by Congress. If such is done, it is only a question of time when it will give way in turn to free coinage. When a full copy of the Secretary's report to Congress is received, a fuller and much clearer idea of his position can be obtained, and will admit of being criticised intelligently. English mail advices report that the exports of silver from that country promise to be fully £8,000,000 for the calendar year—a larger amount than since the phenomenal year of 1884.

London cables came through to-day (Thursday) quoting silver 925 fine at 43¾d; New York quotations came through at 94¾c, while our market is quoted at 95⅛@96c, with no business. Yesterday the Government bought at 96½c. Holders look for better prices again. The next steamer leaving for Japan and China is announced to sail on Dec. 14th, so that export buyers are not anxious at present.

QUICKSILVER—Receipts the past week aggregate 375 flasks. The market continues steady. The outlook is of the most flattering character for a large increase in the consumption.

ANTIMONY—The market has made another advance in sympathy with the East, where a scarcity is reported.

BORAX—Receipts the past week aggregate 375 ctls., and shipment by sea 19,684 pounds to New York and 650 pounds to Mexico. The market is reported steady at current quotations.

LIME—Receipts the past week aggregate 4659 barrels, and exports by sea 350 barrels to Honolulu. The consumption is not only light, but promises to decrease still more in the near future, owing to stormy weather.

LEAD—The market has a firmer tone, notwithstanding the President's remissness in not touching on the Mexican ore importations. There appears to be a feeling that favorable action will be taken by Congress looking to increased duties.

TIN—Imports the past week embrace 481 boxes plate from Rilvardo. The market is reported unchanged. Prompt shipments and consignments to arrive are very firm at the higher quotations. Spot is dull and barely steady. The European and Eastern markets are tending up.

COPPER—The market has made another advance. Our mail advices report that the upward movement is due to the manipulation of the French, who are largely interested in stocks that are affected by the price of copper. Our exchanges, while expressing satisfaction at the advance, nevertheless advise caution, fearing that the rise has been too rapid to warrant a belief in its stability, owing to consumption falling off and the output of the mines being increased.

IRON—Imports the past week were 400 tons pig iron from England and 150 tons from Irondale. Late English and Eastern advices report the markets steady at previous quotations. The high price to which all grades have been sent, together with a closer money market, naturally warrant conservatism; although all advices tend to show that the consumption the world over, for the next few months, will increase rather than decrease. The higher price abroad has not been confined to England, for Germany, Austria, and other countries report rapid advances. In our market, quotations are unchanged, with holders very firm in their views, and predicting better prices in the near future.

COKE—Imports the past week aggregate 2069 tons. The market is well supplied, but stocks being well held, prices are unchanged.

COAL—Imports the past week aggregate as follows: From Coos Bay, 1100 tons; Nanaimo, 2996; Newcastle, N. S. W., 14,480; Sydney, 2000; Seattle, 558; New York, 105; Philadelphia, 199; overland, 21; Departure Bay, 1200; total, 22,640 tons.

The yards are well stocked, and as the weather is still mild, the consumption is light for the season. While dealers are still confident, yet there are signs of an easier feeling for spot, but for Australian just shipped or to be shipped, full prices are asked. Owing to high charters outward from Australian ports, a lower range of values could not be expected. The market for spot and near-by receipts depends largely on the character of the weather from now on.

Eastern Metal Markets.

By Telegraph.

NEW YORK, Dec. 5, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	..	..	$.....	$....	$.....
Friday	44 3-16	96	13 90	3 92½	21 30
Saturday	44 3-16	96	14 10	3 85	21 35
Monday	44⅜	96½	14 15	3 85	21 35
Tuesday	44⅜	96⅝	14 15	3 85	21 45
Wednesday	44½	95⅞	14 00	3 85	21 30

NEW YORK, Dec. 4.—Borax steady at last rates. Quicksilver, 68@70c for trade wants. Copper with little addition to current supplies continues to advance. Lake closes at $14 paid; Arizona, $12.75@13; casting, $12@12.25. Foreign markets strong and higher. Lead moves better at $3.80 bid and $3.85 asked.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, December 5, 1889.

ANTIMONY		25	@ —
BORAX—Refined, in carload lots		7½	@ 7⅞
Powdered " " "		7½	@ —
Concentrated " " "		—	@ 6¾
All grades jobbing at an advance.			
COPPER—			
Bolt		21	@ 22
Sheathing		22	@ 24
Ingot, jobbing		17	@ 18
do, wholesale		15	@ 16
Fire Box Sheets		22	@ 24
LEAD—Pig		4½	@ 4¾
Bar		5	@ —
Sheet		7	@ —
Pipe		6	@ —
Shot, discount 10% on 500 bags Drop, ₱ bag		1 45	@ —
Buck, ₱ bag		1 65	@ —
Chilled, do		1 85	@ —
STEEL—English, lb		16	@ 20
Canton tool		9	@ 9
Black Diamond tool		9	@ 9
Pick and Hammer		8	@ 10
Machinery		4	@ 5
Toe Calk		4½	@ —
TINPLATE—B. V., steel grade, 14x20, P. S.		5 25	@ —
B. V., steel grade, 14x20, spot		4 90	@ 5 10
Charcoal, 14x20		6 75	@ 7 00
do roofing, 14x20		5 50	@ —
do, do, 20x28		11 00	@ —
Pig tin, spot, ₱ lb		23	@ 25
COKE—Eng, ton, spot, in blk & sks, resptvly		14 00	@16 00
Do, do, to load		16 00	@ —
QUICKSILVER—By the flask		48 00	@48 50
Flasks, new		35	@ —
CHROME IRON ORE, ₱ ton		10 00	@ —
IRON—Bar, base		3	@ 3½
Norway, base		4½	@ 5½

IRON—Glengarnock ton	Spot. 35 00	@ —	To Load. 34 @ —
Eglinton, ton	35 00	@ —	32½@ —
American Soft, No. 1, ton	— —	@35 00	32 @ —
Oregon Pig, ton	— —	@35 00	— @ —
Clay Lane White	— —	@ 28 00	27 @ —
Shotts, No. 1	35 00	@35 00	32½@ —
Bar Iron (base price) ₱ lb	—	@ —	— @ —
Langloan	35 00	@ —	34 @ —
Thorncliffe	35 00	@ —	34 @ —
Gartsherrie	35 00	@ —	34 @ —

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	7 75 @ 8 00	Cardiff	9 50@10 00
Liverpool Steam	8 50 @ —	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	9 00 @ 9 00	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Seattle	7 00
Scotch Splint	9 00	Coos Bay	6 00
Greta	9 00	Cannel	12 00
Westminster Brymbo	9 00	Egg, hard	18 00
Nanaimo	9 00	Cumberland, in sacks	19 00
Sydney	8 0	do, bulk	18 00
Gilman	7 00		

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Germania, Nov. 27, $4765; Hanauer, 27, $3050; 28, $3560; Justice, 30, $7294; Savage, $13,200; Hanauer, 26, $3350; Germania, 30, $2538; Hanauer, 30, $3675; Chollar, Dec. 1, $14,885; Con. California and Virginia, 1, $70,246; Eureka Con., $15,000; Alta, 5, $22,001.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

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MR. MELVILLE ATTWOOD showed us this week a collection of rough diamonds from South Africa, which were brought here by Richard D. Atkins. The latter gentleman is investigating several localities in this State where small diamonds have been found, especially, Volcano, Amador Co., and French Corral, Nevada Co.

T. B. BISHOP of this city has been appointed a trustee of the State Mining Bureau, vice Solomon Heydenfeldt, Jr., resigned.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Belcher M Co	Nevada	13	50	Oct 17	Nov 20	Dec 11	John Crockett	327 Pine St
Booth G M Co	California	4	2	Nov 23	Jan 20	Geo E Swinney		310 Pine St
Con Imperial M Co	Nevada	26	5	Nov 22	Dec 27	Jan 15	C L McCoy	329 Pine St
Calaveras Blue Gravel Co	California	4	3	Nov 15	Dec 23	Jan 14	B Burris	240 Montgomery St
California State Co	California	5	25	Oct 21	Nov 26	Dec 23	J O Hanscom	9 Mission St
Con Pacific M Co	California	11	10	Nov 1	Dec 5	Dec 23	F R Luty	330 Pine St
Chollar M Co	Nevada	28	50	Nov 1	Dec 4	Dec 24	C E Elliott	309 Montgomery St
Del Monte M Co	Nevada	2	20	Oct 28	Dec 3	Dec 26	J W Pew	310 Pine St
Golden Jacket M Co	Nevada	3	10	Oct 14	Nov 21	Dec 20	R G McClellan	331 Montgomery St
Gould & Curry M Co	Nevada	63	30	Oct 15	Nov 18	Dec 11	A Durbrow	309 Montgomery St
Grand Prize M Co	Nevada	23	30	Nov 21	Dec 24	Jan 15	R R Grayson	329 Pine St
Gray Eagle M Co	California	15	6	Oct 16	Nov 18	Dec 10	J M Buffington	303 California St
Locomotive M Co	Arizona	5	5	Oct 19	Nov 25	Dec 17	A H Fish	309 Montgomery St
Mono G M Co	California	29	25	Nov 18	Dec 23	Jan 24	B L Burling	309 Montgomery St
Navajo Queen M Co	Nevada	2	10	Oct 23	Nov 26	Dec 11	J F Holling	533 Kearny St
North Occidental G & S M Co	Nevada	1	7	Dec 2	Jan 6	Jan 27	W H Watson	302 Montgomery St
North Gould & Curry M Co	Nevada	11	20	Nov 6	Dec 7	Dec 27	C H Mason	331 Montgomery St
Nevada Queen M Co	Nevada	6	20	Oct 31	Dec 4	Dec 30	H Deas	309 Montgomery St
Phil Sheridan Con M Co	Nevada	4	10	Oct 22	Nov 26	Dec 11	J F Holling	533 Kearny St
Peerless M Co	Arizona	13	10	Oct 11	Nov 19	Dec 10	A Waterman	309 Montgomery St
Palisade M Co	Nevada	2	5	Nov 1	Dec 16	Jan 9	D Buck	309 Montgomery St
Platt & Gil on G M Co	California	4	3 00	Nov 13	Dec 20	Jan 6	C Herrmann	320 Kearny St
Russell Reduction & M Co	California	5	5	Nov 11	Dec 16	Jan 8	J Morizio	328 Montgomery St
Sierra Nevada	Nevada	96	7	Oct 5	Nov 3	Dec 7	E L Parker	309 Montgomery St
Seg Belcher & Mides Co	Nevada	4	25	Oct 27	Nov 4	Dec 3	E A Holmes	309 Montgomery St
Savage M Co	Nevada	74	50	Nov 5	Dec 10	Dec 30	E B Holmes	309 Montgomery St
Summit G M Co	California	11	5	Nov 14	Dec 20	Jan 14	B L Burling	309 Montgomery St
Trinity River Tunnel & M Co	California	2	50	Nov 27	Jan 6	Jan 28	L H Peckman	28 California St
Trojan M Co	Nevada	18	10	Oct 23	Nov 26	Dec 11	J F Holling	533 Kearny St
Utah Con M Co	Nevada	8	25	Oct 23	Nov 26	Dec 16	A H Fish	309 Montgomery St
Union Con M Co	Nevada	39	25	Oct 8	Nov 9	Dec 13	J M Buffington	303 California St
Vine Spring M Co	California	1	15	Oct 10	Nov 11	Dec 9	F S Snell	318 Sacramento St

MEETINGS TO BE HELD.

NAME OF COMPANY	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Head Center & Tranquili y M Co	Ariz.	J W Pew	310 Pine St	Annual	Dec 10
Golden Prize Con M Co		C D Bennett	310 Pine St	Annual	Dec 9
Andes M Co	Nevada	J J E Hawkins	309 Montgomery St	Annual	Dec 18
Gould & Curry	Nevada	A K Durbrow	309 Montgomery St	Annual	Dec 15
Locomotive M Co	Arizona	A H Fish	309 Montgomery St	Annual	Dec 16
Mt Diablo M Co	Nevada	R W Heath	313 Pine St	Annual	Dec 16

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	AMOUNT.	PAYABLE
Champion M Co		T Wetzel	522 Montgomery St	10	Nov 25
Caledonia M Co	Nevada	A S Cheminant	328 Montgomery St	05	Aug 5
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	Dec 10
Barbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	Aug 25
Idaho M Co	California		Grass Valley	5 00	Nov 7
Mt Diablo M Co	Nevada	R Heath	319 Pine St	30	Oct 24
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Nov 10

Mining Share Market.

The market for Comstock shares on Friday, Saturday and Monday had quite a setback, averaging about ten per cent. The decline was engineered by the pool so as to uncover margins and also get in all the stock possible from frightened outside holders who have their holdings paid for. Indifferent to bad reports from the mines were set afloat, as were also reports of assessments to be levied on Crown Point, Ophir, Mexican, Confidence and Challenge. With the financial statements making a poor showing, outside dealers were confirmed in their opinion of assessments to be levied. These statements were, in some instances, made as bad as they could, for what purpose each reader must form his opinion. Now that prices are down, all reports are bad, whereas a short time ago, when stocks were selling at double to-day's prices, everything was gilt-edged. Many brokers have been closing up accounts and report few, if any, stocks on hand. In outside stocks the market has hung fire, with the Tuscaroras on the down-grade. Even Bob Keating's glowing reports of Commonwealth did not brace up prices.

The monthly financial statements of the mines, given elsewhere, show an indebtedness for Crown Point, when in reality the company, after the November bullion is received, will probably have fully $15,000 on hand. Savage will also have money on hand. The bullion production of the mine was, last month, over $30,000, with over $50,000 to come in on assessment. Hale and Norcross crushed 3900 tons of ore last month, averaging over $30 a ton battery assay. Chollar will also make a good showing. When all the returns are in from the mines, they will make a favorable showing and induce buying from a good class of purchasers, notwithstanding the fact of reports being out that when Col. Mackay left he stated there would be nothing until he returned. Louis Sloss is also reported to have said the same thing regarding himself and the market, which was finally capped by Capt. Voll, the spiritualistic mining-stock operator, who stated that there would be nothing until *he* returned.

From the mines there is nothing new to report from private sources. Attention is drawn to the pumping of the Gold Hill mines. As near as we can learn, the water will at first be pumped down below the 1700 or 1800 level, where it will be held and the levels from the 1700 up to the water-level be explored, and if the prospects justify, then more powerful pumping machinery will be put in and the mines drained to the lowest level. On the levels extending from the water-line down to the 1800-foot, the better-informed mining men claim that there is a body of good milling ore, particularly in Crown Point and Yellow Jacket.

Relative to the value of Crown Point and Yellow Jacket on or about the water level, we learn that Gov. Stevenson in the Kentuck trial held in December, 1888, testified that he (Stevenson) ran a drift from Crown Point through Kentuck (95 feet) and connected with Yellow Jacket on the 1300-foot level. A crosscut was made east from this drift 200 feet long, which penetrated 25 or 30 feet of white quartz, value $10 or $12 per ton, 90 per cent of which was gold. The Governor did not think this gold ore, which worked in his mill about $10 per ton, would pay. California mines make a profit out of gold ore worth $2.50 per ton.

The news from the Middle and North End mines is of an encouraging character, and promises are held out with further work of the most flattering character. Work in and around the Ward shaft is still attracting attention.

From the outside mines the news from the Quijotoas and Tuscaroras continues of the same heretofore rosy character; while from the Bodies, that astute mining man, Capt. John Kelley, reports work on all the levels, upraises, etc., being driven ahead. From the fact that the captain is down here a large portion of the time, the disappointed miners in that district must be doing some driving on their own account.

WORK on the large cantilever bridge over the Colorado river, nine miles below Needles, is being pushed forward with all possible dispatch. A dynamo has been put up so that men can work at night. The main span will be of steel and 660 feet long.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov. 14.		WEEK ENDING Nov. 21.		WEEK ENDING Nov. 26		WEEK ENDING Dec 4.	
Alpha	1.35	1.55	1.35	1 40	1 30	1 40	1.10	1 25
Alta	2.15	2.30	2 10	2.15	2.00	2.15	1.60	2.00
Andes	.70	.75	....	....	....	....	.45	.55
Belcher	2.25	2.45	2 30	2 95	2.60	2.95	2.40	2 65
Best & Belcher	3.40	3.75	3 25	3.6	3.10	3.40	2 80	3.15
Bullion	.60	.70	.60	.65	.55	.65	....	....
Bodie Con	.65	.75	.60	.70	.40	....	.45	.55
Benton	3.25	....	....	....	4.50	....	5.00	....
Bulwer	.30	.35	.20	.30	....	....	....	....
Commonwealth	3.05	3.20	2.95	3.05	3.00	....	2 80	3.10
Con. Va. & Cal	6¾	....	6.50	....	6.50	6.00	6.50	6¾
Challenge	2.05	2.10	2.05	2.20	1.90	2 25	1.60	1.85
Chollar	1.65	1.90	1 65	1.85	1.55	1.75	1.55	2.10
Confidence	5¾	5¾	5.00	....	4¼	5¼	4.30	4.35
Con. Imperial	.35	.35	.35	....	.30	.35	.25	.30
Caledonia	....	....	....	....	....	....	.15	.20
Crown Point	2.65	2.95	2.55	2.75	2.50	2.70	1.90	2 55
Crocker	.35	.4	....	....	.30	....	.25	....
Eureka Con	4.10	4.40	....	....	4.00	....	....	....
Exchequer	.65	.70	.60	....	....	....	.53	....
Grand Prize	.80	.85	.75	.75	.45	.60	.45	.55
Gould & Curry	1.55	1.80	1.55	1.95	1.65	1.85	1 60	1.75
Hale & Norcross	3.00	3.20	3 60	3.15	2.90	3.10	2.75	3.00
Julia	.40	.50	.40	.45	.35	.40	.35	.35
Justice	1.65	1.80	1.60	1.75	1.75	....	1.50	1.65
Kentuck	1.15	....	....	....	....	....	.85	.85
Lady Wash	.40	....	.40	.45	.40	....	.30	.40
Mono	.50	.60	....	....	....	3 75	.35	....
Mexican	3.70	4.10	3 70	4.60	3.10	....	2.80	3.20
Navajo	.35	.35	....	....	.25	....	.20	....
North Belle Isle	1.05	1.50	1.20	1.25	1.15	.75	1.00	1.15
Nev. Queen	.75	1 00	.80	....	.70	1.30	.70	.80
Occidental	1.20	1.30	1.25	1 30	1.15	4.50	1 05	1.05
Ophir	4.60	4.95	4.50	4.80	4.00	1.00	3.75	4.20
Overman	.95	1.05	.95	1.05	.95	1.00	.80	.95
Potosi	1.75	2.00	1.50	2.0	1.70	....	1.70	1 80
Peerless	.20	.35	.30	.35	.30	....	.20	.25
Peer	.15	.25	.15	....	....	1.55	....	....
Savage	1.55	1.75	1.50	1.65	1 40	1 55	1.25	1.50
Sierra Nevada	1.60	1 70	1.55	1 60	1.30	2 75	1.10	1.50
Seg Belcher	2.50	2.70	2.55	2.85	2.50	.45	2.40	2.65
Silver Hill	.45	.50	.40	.45	.40	....	.35	....
Scorpion	.25	....	.25	....	.25	....	....	....
Union Con	3.10	3.45	3 30	3.60	2.90	3.4	2.80	3.15
Utah	.70	.80	.65	.75	.70	.90	.75	.85
Weldon	....	....	....	....	.15	....	....	....
Yellow Jacket	3.00	3.20	2.85	3.05	2.75	2.95	2.40	2.80

Sales at San Francisco Stock Exchange.

THURSDAY, Dec. 5, 9:30 A. M.

50	Alta	1.70	
300	Andes	.50c	
100	B. & Belcher	2.95	
150	Belle Isle	1.85	
100	Bullion	.55	
150	Crown Point	2 05	
100	Exchequer	.55c	
50	Gould & Curry	1.65	
100	New York	.15c	
180	Mexican	2 95	
50	Ophir	3 90	
200	Overman	.85c	
350	Potosi	1.80	
150	Savage	1.35	
100	S. B. & M	1.10	
150	Sierra Nevada	2.50	
140	Yellow Jacket	2.45	

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E. H. SCHAEFFLE—Fresno Co
C. EDWARD ROBERTSON—Humboldt Co.
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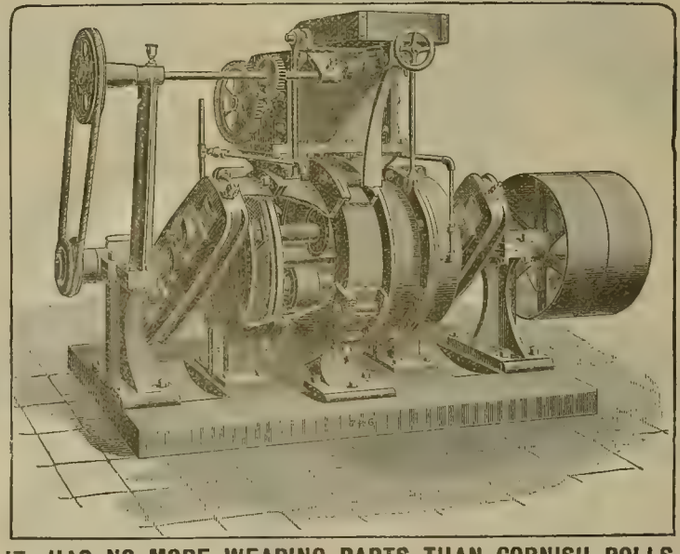
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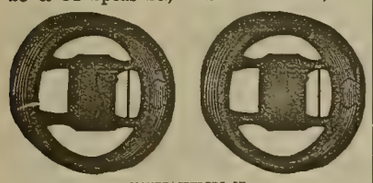
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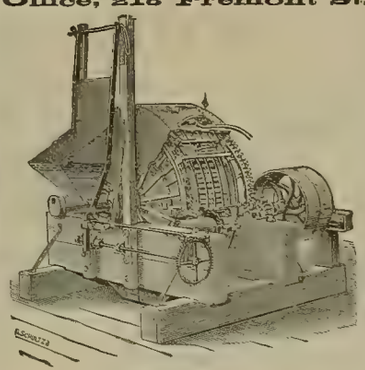
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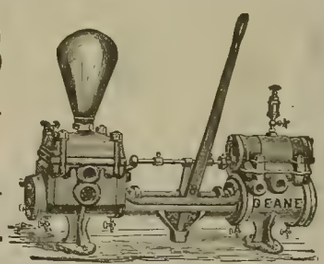
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COAL MINES OF THE WESTERN COAST.

A few copies of this work, the only one ever published treating of Pacific Coast Coal Mining, have been obtained, and are for sale at this office for $2.50 per copy. It was written by W. A. Goodyear, Mining and Civil Engineer, formerly of the California State Geological Survey.

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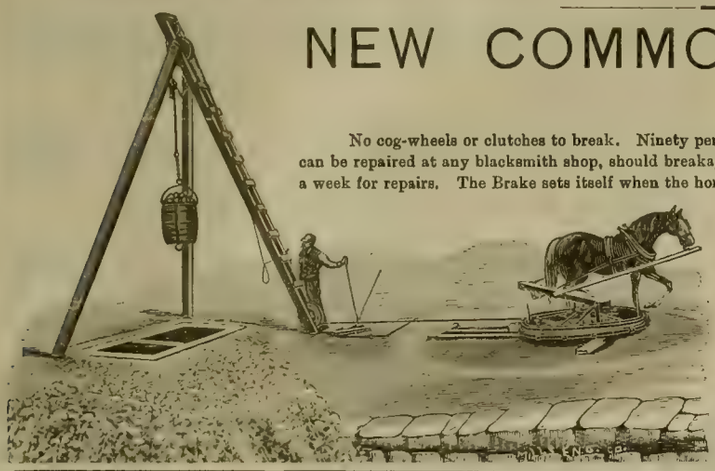
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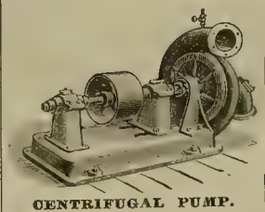
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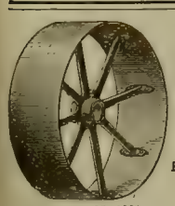
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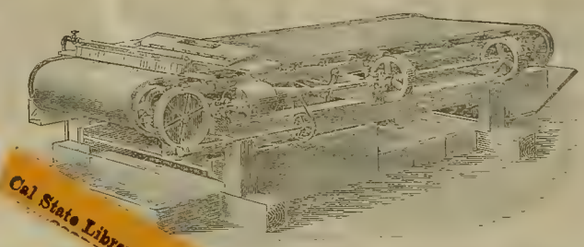
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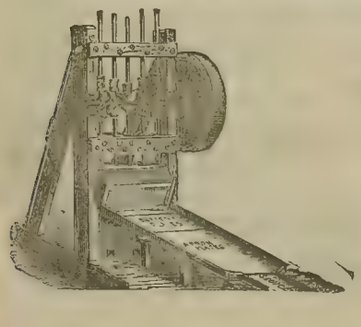
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DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, DECEMBER 14, 1889.

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Ore-Jigging Machines.

On page 455 of this number of the PRESS are given drawings of the Parsons percussion tables, and on this page are drawings of the Parsons & Fisher ore-washer, which machines are used at the new ore-dressing works of the St. Joseph Lead Co. The preliminary jigging of the ore is done in the jig or washer shown herewith. It is a two-sieve under-piston jig, each sieve 24 inches by 39. The piston is vertical, 15½ inches in diameter, and moves in a short horizontal cylinder 4½ inches long in the partition between the two jig-boxes. The piston-rod is horizontal and enters through the stuffing-box. For convenience the jigs are made double, *i. e.*, four sieves, or two jigs, are united in one machine. One great advantage of this form of jig is the small floor space occupied by a large number of machines, the whole area of the jig-box being available for jigging.

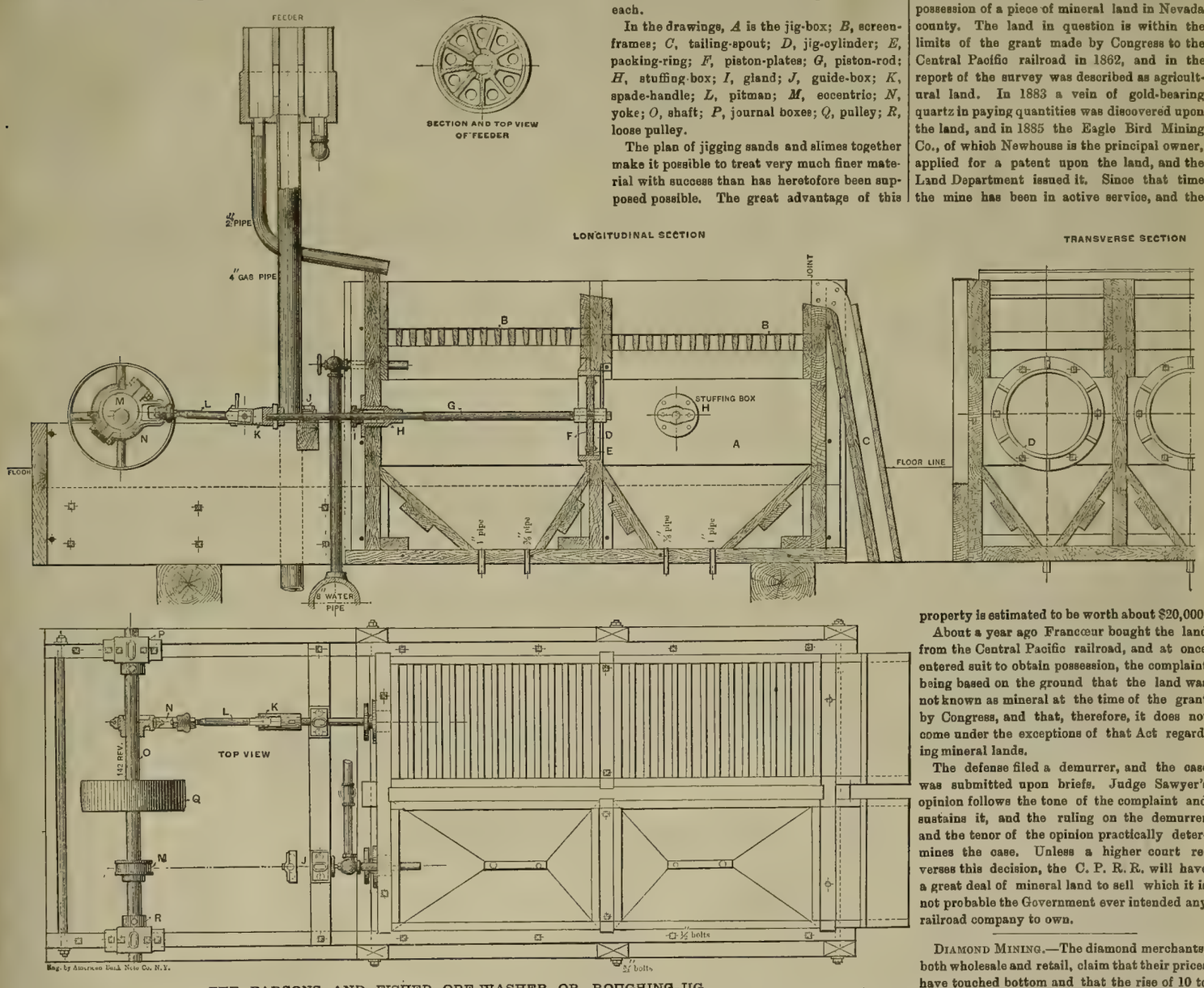
The stroke of the piston is two inches, and the number of strokes per minute 150. The quantity of under-water required is about two cubic feet, or 16 gallons per minute. The consumption of feed-water is 16 to 18 gallons per minute, containing about 13 pounds of sand (dry weight). There are nine jigs, 4½ machines, for each set of crushing apparatus. Each jig treats, therefore, about nine tons per 24 hours, or less than one-third the capacity of a jig of equal area according to the data of Rittinger, so that the mill has ample jig capacity.

In the Lake Superior copper-mills the tendency, of late years, has been to increase largely the number of jigs, in the attempt to lessen the losses in the tailings. The St. Joe mill has, however, a larger jig capacity, in proportion to the rock crushed, than any of the Lake Superior mills. For the treatment of 800 tons of material per 24 hours there are 252 jig-sieves. The rough sands at the St. Joe mill are divided between 90 sieves, or 9 tons per 24 hours each.

In the drawings, *A* is the jig-box; *B*, screen-frames; *C*, tailing-spout; *D*, jig-cylinder; *E*, packing-ring; *F*, piston-plates; *G*, piston-rod; *H*, stuffing-box; *I*, gland; *J*, guide-box; *K*, spade-handle; *L*, pitman; *M*, eccentric; *N*, yoke; *O*, shaft; *P*, journal boxes; *Q*, pulley; *R*, loose pulley.

The plan of jigging sands and slimes together make it possible to treat very much finer material with success than has heretofore been supposed possible. The great advantage of this system of jigging is the large proportion of sands successfully treated and finally disposed of by the roughing-jigs alone. Out of 800 tons per day, only 136 tons require further treatment, viz., 30 tons raggings, crushed and treated on the three-sieve jigs, 66 tons fine sand, also treated on three-sieve jigs, and 40 tons of slimes treated on the side-bump tables.

The sole disadvantage lies in the difficulty of forcing all the very finest slimes to go through the jig-sieves.



THE PARSONS AND FISHER ORE-WASHER OR ROUGHING-JIG.

An Important Mineral Land Decision.

Judge Sawyer of the U. S. Circuit Court has overruled a demurrer, and rendered a decision in favor of the plaintiff in the important mining case of George H. Francœur against Oscar Newhouse. The action was brought to recover possession of a piece of mineral land in Nevada county. The land in question is within the limits of the grant made by Congress to the Central Pacific railroad in 1862, and in the report of the survey was described as agricultural land. In 1883 a vein of gold-bearing quartz in paying quantities was discovered upon the land, and in 1885 the Eagle Bird Mining Co., of which Newhouse is the principal owner, applied for a patent upon the land, and the Land Department issued it. Since that time the mine has been in active service, and the property is estimated to be worth about $20,000.

About a year ago Francœur bought the land from the Central Pacific railroad, and at once entered suit to obtain possession, the complaint being based on the ground that the land was not known as mineral at the time of the grant by Congress, and that, therefore, it does not come under the exceptions of that Act regarding mineral lands.

The defense filed a demurrer, and the case was submitted upon briefs. Judge Sawyer's opinion follows the tone of the complaint and sustains it, and the ruling on the demurrer and the tenor of the opinion practically determines the case. Unless a higher court reverses this decision, the C. P. R. R. will have a great deal of mineral land to sell which it is not probable the Government ever intended any railroad company to own.

DIAMOND MINING.—The diamond merchants, both wholesale and retail, claim that their prices have touched bottom and that the rise of 10 to 15 per cent in the retail trade within the last six months will be steadily supplemented. The reason given is that the De Beers Mining Co. of South Africa controls 29-30ths of the output, and is in a position to control the supply, and consequently the prices.

IRVING M. SCOTT says he expects shortly to have a Government contract to build a 7000-ton cruiser, and will increase his plant at the Union Iron Works and take on a much larger force of ship-builders and iron-workers.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

In Calaveras County.

A New Concentrator and an Ore-Roaster.

EDITORS PRESS:—At Angels everything is moving along smoothly and briskly. The mines are steadily improving and each month sees an additional mine put on the list of producers. All the mills are clattering away save where they have been shut down to sink, new mills are in course of erection, and Angels is destined to be the leading mining camp on the mother lode.

The Gold Cliff is being worked under bond by Mr. Hayward's agent, and will, without doubt, soon be added to the paying mines of Messrs. Hayward, Hobart & Lane. Mr. Dolling has "struck it rich," and all Angels rejoices with popular "Oho!" over his strike.

Tullock Concentrator.

Mr. Jas. Tullock, or "Uncle Jimmy" as he is favorably known, has perfected his concentrator and has had it most severely tested. Mr. Lane of Hayward, Hobart & Lane dumped the ore on to the table by the bucket and shovelfull in a vain effort to clog it. So satisfactory is it in its working that a number have been ordered by the largest operators of Angels, one superintendent declaring that from actual tests he knew he could with two of Tullock's concentrators do the work of eight vanning machines at one-twentieth of the first cost. The concentrator is simply the old-fashioned rocker with the ducking running on rollers which carry the screened sulphurets up over the front, while the tailings run off over the lower end. I found the concentrates almost pure metal, while the tailings were clean sand. The concentrator is simple, cheap and a success, and is destined to fill the long-felt want of a low-priced, successful concentrator.

A New Mill.

The Con. Calaveras Gold Mining Co. at Robinson's Ferry have in course of erection a Huntington mill. This is being erected about half-way along on their 9000 foot on the mother lode. The mill will be used to test the ore at this point on the vein. At the same time the tunnel from the south end will be continued on in. It has now been driven over 1100 feet. Numerous shafts will be put down on the 9000 feet of the vein, and the property most systematically prospected and developed before the necessary mills are erected. If all of our English mining operators were to conduct their mining operations on as conservative and systematic a basis as Mr. Theo. Allen of this company is doing, their would be but few failures.

A Pocket Mine.

Mr. Harvey Wood of Robinson's Ferry is still in bonanza on his pocket mine. He is working a small vein that crosses the different branches of the mother lode at their junction, his vein cutting them at right angles.

River Mining.

Mr. J. R. Moffitt of Chinese Camp has met with bad luck in his river-mining the past season. He had the river-bed pumped dry and the ground stripped ready for operations when a sudden rise in the river drove the men out. After this had subsided, the water was again pumped out and the miners had cleaned up but a few pans full of dirt, which in their language were "more gold than dirt," when that October storm came down upon them, sweeping away their dam and undoing in an hour all the work of the season. Mr. Moffitt lost over $9000, to say nothing of the gold that lay almost in sight. The coming season Mr. Moffitt will erect a permanent dam, and he has every reason to believe that he will then reap the harvest of gold that has eluded his grasp in each of the past three seasons.

Mr. Moffitt has not confined himself to his river mining, but has turned his experience gained in former years in smelting to the perfection of

The Moffitt Oxygen Ore-Roaster.

This invention, while not complete in every detail, has advanced far enough to command the attention of every owner of ore requiring roasting. The principle is that of a complete roast in granular form of all ores under a great air-pressure in a confined chamber burning oxygen. The machine is automatic in its operation, feeding and discharging continuously. While the method is a combination of mechanical and chemical skill, there is an entire absence of theoretical accompaniments. Mr. Moffitt will have his roaster in operation within another month, when the owners of refractory ores will be invited to send in their rock for trial, and at the same time inspect the operation of this compact and economical ore-roaster.

Across the Mother Lode,

In Tuolumne county, but little is doing, owing to an absence of water. At Quartz mountain the Haslep mine is kept free of water while offered for sale. The mill has been leased by the company's former superintendent, Mr. Bowman, who is milling the ore extracted from the Dutch mine. This is being developed under bond by Messrs. Brigham, Lane & Garrard. Their shaft is now down 135 feet, and shows that the two branches of the mother lode join at this point, forming a vein 60 feet in width, with an average milling value of $3 a ton.

Both the owners of the mine and the operators are very conservative in their statements, but there is no doubt about the Dutch mine being put upon a working basis, and soon added to the numerous profitable mines on the wonderful mother lode. E. H. SCHAEFFLE.

Mines of a Rainless Land.

Iquique and the Silver Mines and Saltpetre Deposits.

[Written for the PRESS by "DON JUAN."]

The coast between Callao in Peru and Coquimbo in Chili is the most monotonous on the whole American continent. The track between Arica and Copiapa, a distance of over 600 miles, is that in which the rainless zone is most pronounced. With the possible exception of Pisagua, there is no inhabited place where good drinking-water can be had. Nearly all the settlements, therefore, along this barren waste are either dependent on steamer transport for fresh water or obtain it by distillation of sea water. Here is a country indeed where there is no trace of vegetable life whatever. One is not even able to detect the smallest lichen by aiding the eye with the best of lenses. The whole surface appears as if water had never run over it. Every edge of the rock appears sharp, as if freshly broken. One would hardly believe, from the above description, that people could be found who would inhabit such a desert; but such is the case. The wants (or greed) of man have established many industrial towns along this coast, for the purpose of extracting the precious metals from the bowels of the earth and for working the very extensive deposits of alkaline nitrates. The most important place of these settlements is the port of Iquique, now in Chili, but before the last war part of the Republic of Peru. This city is not only the most important in the rainless zone, but ranks second only to Valparaiso on the whole west coast of South America.

Iquique is situated in the province of "Tarapaca" in the extreme northern part of Chili, in lat. 20, south; long. 71. It has a good harbor and safe anchorage. At least the outer harbor (as it is called) is large and safe, but the smaller or inner port is very dangerous. For this reason ships are always long delayed in this place discharging or taking in cargo. The inner harbor is so rough as to permit of traffic over it only about three days of each week; for as there is no wharf out to the deep water, the enormous amount of cargo handled at this port has to be transported by lighters and large boats. I saw several men drowned here on New Year's Day last in attempting to reach their ships in small boats on one of the rough days.

There are nearly always from 60 to 80 large ocean vessels in the port, English, German and French, but it is very rarely (I am sorry to say) that the stars and stripes are seen in this, or for that matter any other South American port. I know from personal experience that the people prefer American goods, and in particular, American tools and machinery, but they are rarely ever seen in the market.

Iquique has a population of about 20,000, 90 per cent of whom are natives of Chili, Peru and Bolivia; the remaining ten per cent are English, Germans and French, with a very few Americans thrown in (just enough to promote business and enterprise among the balance). Iquique has two large distilleries (for water), and also a line of small steamers running up the coast to Arica, bringing down fresh water from there. It has three smelters and a large railroad shop, with a line of railway up the coast to Pisagua and into the nitrate deposits. There are two first-class hotels in the city and a number of smaller ones. The town is nearly all built out of frame houses; very few adobes are seen. One of the best houses is occupied by Dr. J. M. Merriam, American Consul of the Port, who is a very courteous gentleman and looks to the interest of our citizens at that place with the greatest care and attention.

By far the most important industry of this Province is that of mining, purifying and shipping nitrate of soda. The Government charges an export duty on this product, and from this source alone they received in 1888 the enormous sum of $18,000,000.

Next to the nitrate business is that of mining for silver. Some of the famous silver mines of Tarapaca have been worked for over 200 years. In my next letter I will give your readers some information as to the extent of these mines and the method employed in working them.

CLOSED DOORS.—A recent dispatch from Albuquerque, N. M., says: The stockholders' meeting for the election of directors of the Lincoln Lucky Mining Company was held here. The old directors were unanimously re-elected, with the exception of Thomas Wright, who had sold his interest. The mine is the most valuable in New Mexico, and is capable of producing about 60 tons of ore a day, netting the company from 20 to 25 per cent on the purchase price of $150,000. In the face of all this it was resolved to close down the mine, thus throwing out of employment a large force of miners and teamsters.

Mineral Lands and Railroad Grants.

In the report of the Secretary of the Interior he has the following to say concerning mineral lands on railroad grants:

It is reported that the work of examining exparte mineral entries is in arrears about two and a half years, and in contested cases about two months. There have been suspended in the offices lists of railroad sections involving some 5,561,207 acres, upon the question whether the company shall be required to furnish mineral affidavits or not. The question presents itself in regard to mineral lands lying within the grants of railroads running through the mineral belts, and which would otherwise than because of their mineral character be included within the railroad grants. The Act of Congress absolutely and unqualifiedly reserves all mineral lands from the railroad grants made to the most extended and important railroads of our country, and this reservation affects the claim of such roads as the Northern Pacific to a great part of its land subsidy.

It also affects to a very considerable degree the Central Pacific and Southern Pacific roads with some others, and how to determine what are mineral lands at this time when the roads are claiming their grants is indeed a difficult and most important matter. Originally it was left to the company to make affidavit in the form adopted by my predecessors and by them deemed sufficient for a long while, but by which it was not made necessary for the officer taking the oath to swear to his actual knowledge that the land was not mineral. Many of the selections made by the railroads under their grants were supported by such affidavit, but upon the same coming before the Commissioner of the General Land Office he demanded that further affidavits should be made, the same as required from settlers on homestead claims, whereby actual knowledge of the fact that the same was not mineral land was required to be sworn to. This the railroad companies have failed to do, insisting that their claims, made under the regulations at the time existing, are valid and should be allowed.

This question is not yet determined, but it is deemed a matter to which your attention should be invited for the purpose of having, if necessary, some further legislation upon the subject. On one hand, it is to be noted that additional affidavits have been required since the selections were claimed; on the other stands the absolute reservation of the law and the right of the people to enjoy these mineral lands, if such indeed they be, among the selections made by the railroads. If legislation is not made on this subject the Department will have to decide by such light as may be obtained as to the real nature of the lands, whether mineral or not, however difficult the inquiry may be and whatever the responsibility assumed.

It is deemed advisable, however, that a law should be passed by Congress enabling the Land Department to thoroughly investigate the character of lands, supposed to be mineral, and within the reservation of the law, before the railroad is entitled to any cession whatever. It would require a considerable appropriation for the purpose of making an investigation and survey, and connected with this, authority should be given to the Secretary of the Interior to refuse to certify lands to the railroads until there be clear proof that the same are not mineral. The question is a most important one. It is far-reaching in its results, and may affect the welfare and independence of many of our citizens.

It would not be unreasonable to direct that the patents issued should themselves contain a reservation of any land therein described if it proved upon further development to be actually mineral land. The mineral lands should be preserved for our people, and there is no claim on the part of the railroads to obtain these sources of vast wealth not intended for them that should be humored to the least degree beyond the law. This I say in no spirit of hostility to the railroad companies, but from a thorough conviction that the best interests of the Republic would be served by dividing this vast mineral wealth among individuals rather than by allowing it by any means to fall into the possession and control of large corporations. It is not intended to be granted to them, and they should not be allowed to obtain it by default. Sufficient means of proving exactly what the character of the land is, should be provided.

There are in this division also some 2129 suspended entries. It is desirable that a re-examination of these cases should be had, as it is believed it would lead to the granting of patents in many cases. It is intended that additional proof shall be called for and the entries either canceled for failure of the claimants to meet such requirements, or, if the proofs authorize it, patents issued.

THE PAMLICO MINE SUIT.—At Hawthorne, Nev., the case of the Pamlico Mining Co. vs. Garrison & Key, which has excited great interest in mining circles, has been decided. The special issues decided by the jury are to the effect that the Pamlico Mining Co. has a valid claim, and that in their claim two ledges exist, known as the east and west ledges, having their tops within the claim, and that they do not cross the side line of the claim on their course, but on their extent downward into the earth they pass through the northeast side line of the claim and beneath the adjoining lands, including the Lakeview, the property of defendants; also that the defendants have asserted an adverse claim to some portion of the east vein to find the northeast side line of the Pamlico. The judge stated from the bench that the findings of the jury warranted a judgment and decree for the plaintiffs quieting its title to the Pamlico mine and the veins on their extent downward and for costs for suit. A force of men will be put to work in the Pamlico and active operations will begin at once.

Using Oil with Ores.

The *Alta California* says: Experiments are now being made in Denver with a new appliance for the concentration of dry silicious ores. So far the experiments have proved a success, the tailings from the concentrator—if so it may be called—only running one ounce in silver from a crude ore that ran over 10 ounces of silver per ton. The first unimportant means of testing the new system having proved the correctness of the theory, other larger and more capable means have been employed. The whole system of concentration appears to be based on the well-known affinity of the lighter forms of sulphuret and chloride of silver for oils. Petroleum is the oil now being used by the parties having these experiments in charge, and appears from its density to possess the requisite adhesiveness to effect the result desired. The ore is first crushed to such a degree of fineness as to enable it to pass through a 40-mesh screen, and, while dry, is thoroughly mixed with the oil, after which it is placed in a circular tank, or receiver, through the center of which runs a rotating hollow tube, to the bottom of which tube is attached, on two opposite sides, a couple of fans, the lower edges of which are unevenly cut in order to send—in the revolution—the lighter particles of ore and oil mixture to the outer side of the drum, or cylinder. This rotating hollow tube is perforated at or near the bottom, and, when the receiver is thoroughly charged, acidulated. (Sulphuric acid is used.) Steam is introduced through the tube and is forced to the bottom of the mixture, while the arastra-like fans, attached to the bottom of the tube, keep the whole mixture in motion, and the action of the revolving tube, the fans, and the injected acidulated steam causes the lighter portions of the mineral-charged oil to float to a point just above the center of the receiver, where there are suspended two semi-circular doors, which, when the oil has passed above them, laden with its precious freight, are raised, and the superfluous water allowed to drain through slight perforations in the bottom of these semi-circular doors, after which the mineral-laden oil is carefully removed to settling barrels, revolving with jets of steam injected continuously from the lower ends. These settling barrels being placed at an angle permit the mineral-laden oil to pass through openings in the ends, which are connected with shallow settling tubes or tanks from which the concentrated ore is shipped directly to the smelters, who will hardly be likely to refuse so pleasant an addition to their heating powers.

THE PACIFIC ROLLING MILLS have brought suit in the Superior Court against the Mission Transfer Co. to recover $159,872 78 for alleged breach of contract. An agreement was stated by which the Transfer Co. undertook to furnish the Pacific Co. with crude petroleum having a specific gravity of 32° to 35° Beaume scale as an experiment for heating iron, the cost not to exceed $1.70 per gross ton and the Pacific Co. to retain an option of contracting for 32° grade petroleum during three years, at $1.25 per barrel. Afterward, as the plaintiff alleges in the complaint, the Pacific Co. made preparations for carrying out the contract at a cost of $9,872 78, but when a call was made upon the Transfer Co. the latter refused to furnish the petroleum. The Transfer Co. filed a demurrer to the complaint, but Judge Hunt overruled it. While admitting that the contract is difficult of construction, the Court expresses the opinion that the complaint states a cause of action which entitles the plaintiff to some relief and leaves the controversy to be settled by the usual mode.

CALIFORNIA CON. QUICKSILVER CO.—This company with a capital stock of £450,000 has been "launched" in London. The New Idria mines form part of the property, and have produced over 140,000 flasks of quicksilver, mostly from shallow workings, and it is to the prosecution of the said workings in depth that the company looks to pay dividends. There are also "many thousands of tons of low-grade ore, both underground and on the dump, which will be available for treatment." A good deal of work has been done upon these mines, and the Picacho group has also been partially developed at an expenditure of about £18,000, with results which, in the opinion of experts, point to favorable issues in the future. A further source of revenue lies in the Chrome Iron ore property, 2220 acres in extent, which contains "valuable deposits." The vendor is to receive for the three properties, with all their machinery and appurtenances, on the spot and in New York, £380,000, of which £150,000 will be discharged in fully paid-up shares.

THE Alta Mining Co. has just received $25,000 for the sale of ore concentrates at Salt Lake.

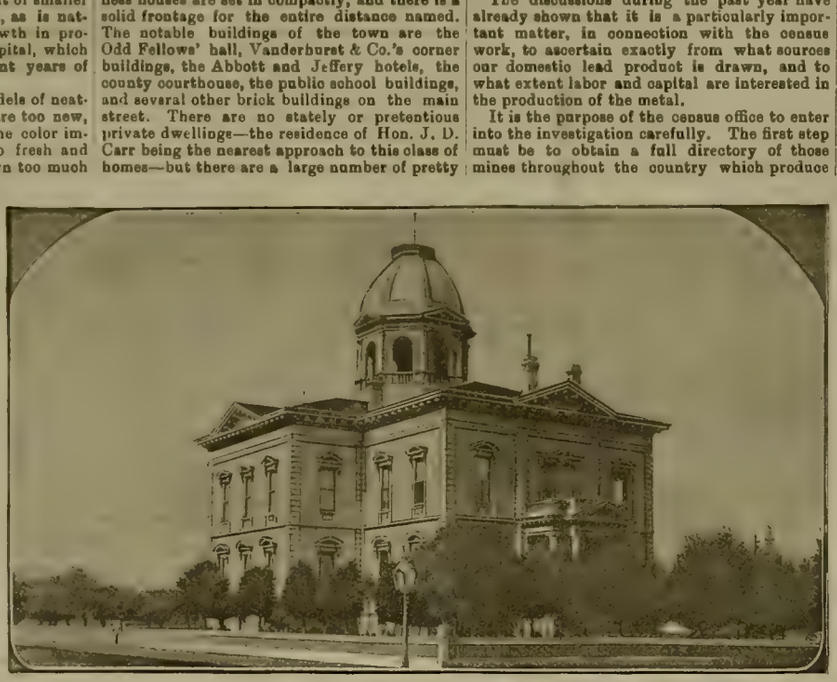
California Towns.

Salinas City, Monterey County.

There has been notable improvement in California towns during the last decade. This is true not alone of the metropolis and of the group of our large interior cities, but of smaller towns and villages as well. Indeed, as is natural, the towns reflect well the growth in production, and in the acquisition of capital, which has happily characterized the recent years of California's life.

Many of our small towns are models of neatness. The traveler will say they are too new, the bricks and mortar too near the color imparted by the kilns, the paint too fresh and staring and the fragrance of the town too much like that of the sawmill. It is true that they are deficient in rows of ancient trees, which give grace to the street and comfort to the pedestrian; it is true that they lack hoary and picturesque ruins—moss-grown and ivy-wreathed walls of brick and stone and all that sort of thing—for the old clapboarded "brought-around-the-horn-in-'49" houses do not, unfortunately, make picturesque ruins. It is true that the bright new street-car sometimes floats along in a trackless sea of mud, and that the electric lights sometimes shed their rays over the homes of the ground-squirrel, but these are only signs of new ones and prophesies of the future, when the builder shall come within sight of the enterprising boomer.

But talk as the tourist may of our towns and villages as compared with the time-honored hamlets of the effete East, there is very much in many of them to enjoy and admire, and they are a credit to the young State in which they are rising. We could name a host of such towns, which are as full of thrift, energy, and the spirit of development as the most appreciative mind could desire. Our engravings on this page give scenes in one of the best of our smaller towns, Salinas City in Monterey county. The county court-house is as tasteful as the most exacting murderer could choose to be tried in, and the bird's-eye view of the town with its neat streets and hundreds of homes embowered in shade trees, as cozy and neat a residence place as the most virtuous could cast his lot in. Monterey county is full of historic interest and of new life. Its charm as a seaside resort is world-wide, and the productions of its large valleys and rich hillsides are hardly less widely known.



COURT-HOUSE, SALINAS CITY, CAL.

The remarkable fertility of that portion of Monterey county which is comprised in so much of the Salinas valley as is tributary to Salinas City, is almost too well known to need recapitulation. Travelers through this section, over the Southern Pacific railroad, always have their attention attracted by the remarkably fertile appearance of the soil—an appearance which is abundantly borne out by experience in its cultivation. As is well known, it is in this valley that the sugar-beet is now being cultivated on a large scale, and though it is a new business for most if not all the farmers, still the results of the past season's operations have been most promising and encouraging. There is scarcely a crop that is produced anywhere in California but here finds a congenial soil and climate. Not the least of the advantages enjoyed by the farmer of this section is the nearness to market, but two or three hours being required to land products of any kind in San Francisco. This alone makes this section a favorable one for the production of small fruits, poultry, etc., which must be hurried to market as quickly as possible.

Salinas is the county seat of Monterey county, situated about midway of the valley, and ten miles from the Bay of Monterey. It is the commercial center of Monterey county, and has as bright prospects as any town of similar size in California. It has a population of about 3000. Most of the business of the city is transacted on Main street, which can boast of several handsome and substantial buildings, which, with the smaller structures, line the street for a distance of four blocks. The business houses are set in compactly, and there is a solid frontage for the entire distance named. The notable buildings of the town are the Odd Fellows' hall, Vanderhurst & Co.'s corner buildings, the Abbott and Jeffery hotels, the county courthouse, the public school buildings, and several other brick buildings on the main street. There are no stately or pretentious private dwellings—the residence of Hon. J. D. Carr being the nearest approach to this class of homes—but there are a large number of pretty cottages, surrounded by green lawns, embowered with flowers and shaded by evergreens and natural trees, thus giving to the place a home-like and comfortable appearance which is highly pleasing. The city is provided with schools unexcelled by any in the State. There are eight church organizations, while societies of a fraternal and social character are numerous. The people are liberal, enterprising and cultivated, which is shown by the city being wide-awake and progressive. The town is supplied with water-works and lighted by gas and electricity. There is a good pavement upon Main street, and bituminous or artificial stone sidewalks are the rule for most of the distance through the business part of town. There are two first-class weekly newspapers and one lively daily.

The city has two parks, one of which is somewhat improved; the other is not. With the exception of the Salinas flouring-mill, a planing-mill and a machine-shop, there are no manufactories in Salinas. The flouring-mills have a capacity of 500 bbls. per day (24 hours' run), and are fitted up with the latest improved roller process machines. There is an immense grain warehouse near the mills, 1100 feet in length, which we noticed was well stored with wheat. A beet-sugar factory is contemplated at Salinas, being an enterprise of Claus Spreckels, in addition to the one built by him at Watsonville.

SENSIBLE MINERS.—A miner named Granville was killed at Virginia City recently, and the funeral cortege was unusually large and was headed by a large delegation of workmen and miners on foot. All of the employes of the Gould & Curry and Best & Belcher mines were included in the latter, and they will donate to deceased's widow $8 each—what would have been the cost of carriages had they not attended the obsequies on foot.



BIRDS-EYE VIEW OF SALINAS CITY FROM THE DOME OF THE COURT-HOUSE.

Reports of Lead Product Wanted.

Special Census Agent C. Kirchhoff, Jr., of New York has written to Mr. Mackintosh of the Pioneer Sampling Works, Salt Lake, the following letter:

The discussions during the past year have already shown that it is a particularly important matter, in connection with the census work, to ascertain exactly from what sources our domestic lead product is drawn, and to what extent labor and capital are interested in the production of the metal.

It is the purpose of the census office to enter into the investigation carefully. The first step must be to obtain a full directory of those mines throughout the country which produce ore containing lead in sufficient quantity to warrant payment for it by samplers and smelters. I would beg you to further this worthy object by sending me at your earliest convenience a list of the mines, with the name and address of the manager, from which you have bought ore during the current year.

This is all very well, as far as it goes, but the trouble is it does not go far enough. The census agent should prepare a circular for mailing to every mine in this inter-mountain region, if not to all the mines in the country, asking these questions: Give the number of mines producing lead ore in your district. Percentage of lead in the ore. Wages paid in each mine. Cost of extracting the ore. Freight on ore to the smelters from the mines. Cost of sampling. Cost of smelting. Freight on bullion from the smelters to the New York market. In short, give in detail the cost of each step of production, and add the freights in mining machinery and supplies and amount shipped annually into the mountain regions, showing also how the railroads would be affected were shipments of supplies in, and ore and bullion out, to be curtailed. Then let the mine superintendents impress firmly on this census agent's mind that without suitable protection for the western miner as against Mexican peon labor, American mining interests will go by the board, dragging down the western railroads and the general prosperity of the West with them.

A NEW METHOD of weather prediction has been discovered by Ch. Montigny, a French physicist. He has observed that the scintillations of stars increase before many storms, indicating disturbance of the upper atmosphere hours before the meteorological instruments show any change. The fiercer the storm, the more is the strength of the scintillations increased.

Mines and Labor.

The following is the official statement of sums disbursed to employes of Comstock mining companies for services during the month of November: Alta mine and mill, $7160; Andes, $225; Alpha, $1679; Baltimore, $2975; Belcher, $6349; Best and Belcher, $1941; Benton Con., $550; Bullion, $125; Challenge, $800; Confidence, $2400; Caledonia, $1125; Chollar, $8104; Con. Cal. and Virginia, $43,817; California Mill, $854; Combination Shaft, $395; Carson River Mills, $18,500; Crown Point, $9763; East Best and Belcher, $240; Electric Light Company, $2725; Exchequer, $1679; East Sierra Nevada, $950; Gould & Curry, $3312; Hale and Norcross, $12,930; Hendricks, $1500; Imperial, $3000; Justice Mine and Mill, $6750; Jumbo district, $1950; Kentuck, $675; Mexican, $2296; North Occidental, $767; Con. New York, $1222; North Gould and Curry, $275; Occidental, $5766; Occidental Mill, $2761; Osbiston Shaft, $240; Overman, $3275; Ophir, $2003; Potosi, $3951; Savage, $7888; Scorpion, $250; Seg. Belcher, $1400; Sierra Nevada, $3242; Silver Hill, $2306; St. Louis, $125; Six-mile Canyon Mill and Mines, $2875; Union Con., $2311; Union Shaft, $240; Utah Con., $3184; Yellow Jacket, $10,500; Water Company, $13,500; Ward Shaft, $1149; total, $214,001.

The above is merely the sum disbursed in wages and does not include other operating expenses.

A SAGACIOUS HORSE.—The Guerneville *Herald* says: The Sonoma Lumber Company has at its mill a most sagacious horse. He has been used in the sawdust cart for twelve years to haul away the sawdust from the mill. He has become so well acquainted with his work that he goes from one hopper to another, throughout the most intricate passageways, without a driver, and he never strikes a post, and begins and quits work by the whistle, the same as the men.

AN OPENING FOR PROSPECTORS. — Within two years we are to have a railroad through Southern Nevada to California, from Salt Lake City. This road will open up an immense and hitherto inaccesible mining region. It will be a fine field for prospectors, and as the Carson & Colorado road will connect with the road mentioned above, the mineral belts will be reached very easily. Thus the mines of Southern Nevada will add much to the business of the Carson & Colorado.

NEW RAILS DIRECT FROM THE OLD.—It is stated that Jacob Reese of Pittsburg has interested a number of Louisville capitalists in his method of reducing old steel rails of heavy sections to light sections fit for relaying. The experimental steps are being taken at the works of the New Albany Rail Mill Company, at New Albany, Ind., and subsequent operations will depend entirely upon the results shown there.

MINING SUIT.—The Waterloo Mining Company of Milwaukee, Wis., has filed a suit in the United States Circuit Court at Los Angeles against John S. Doe, the San Francisco capitalist, asking damages in the sum of $200,000. In the petition the company set up that they own a ledge in the Calico Mining District in San Bernardino county, from which defendant has been taking mineral since Feb. 11, 1889.

A VALUABLE and interesting specimen of crystallized gold has been received at the museum of the State Mining Bureau from Lovelock, Butte county. The forms of the gold crystals are clearly and beautifully cut, and the specimen is additionally interesting because of its great scarcity in the locality in which it was found.

AT the annual meeting of the stockholders of the Baltimore M. Co., the following officers were elected: John H. Dickinson, president; Phil Selner, vice president, and W. J. Hamilton, H. S. Wynne and A. K. Grim, directors. A. K. Grim was re-elected secretary and E. Strother, superintendent.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

STOPPED.—Amador *Ledger*, Dec. 9: The mill at the McKenzie Bros.' mine near Irish Town has been forced to suspend, owing to the supply of wood failing and the inability to get more hauled on account of the condition of the roads. It was expected that the mill would be able to resume operations the latter part of this week.

THE Reed and Askey mill has also been shut down temporarily, on account of the soft state of the road, rendering hauling rock from the mine to the mill impracticable.

THE Italian quartz claim in the black hills near the Seaton, owned principally by the Ginocchio Bros. of Jackson, has leased the Seaton mill of 20 stamps. The mill is now being put in order for crushing operations. Some excellent rock has been lately taken out of this claim, and it gives every promise of turning out a fine paying property.

THE CASCO MINE.—*Dispatch*, Dec. 7: The old Casco or Hardenburg mine at Middle Bar, which has lain idle so many years, is to be brought into activity again and worked on a large scale by a company of San Francisco and Eastern capitalists. In fact, we may say that work has already been commenced, as some of the machinery is already on the ground, and the necessary buildings will be put up as soon as the lumber can be delivered and the weather will permit. The work will be under the management of James Evans, a miner of many years' experience.

MITCHELL.—We understand that arrangements are being made to open up and thoroughly develop the Mitchell mine at Middle Bar, and that work will be commenced forthwith. There are also several other mines in that vicinity, including the Sargent and Amador Queen mines, upon which it is said that work will be resumed in the near future.

El Dorado.

CHILI RAVINE.—Georgetown *Gazette*, Dec. 5: Work at the Chili ravine mine is being vigorously prosecuted. The mill is running regularly and is paying handsome dividends. Recent developments in this mine are decidedly promising.

ZANTGRAFT.—Placerville *Observer*, Dec. 7: The present rain will probably start the mill at the Zantgraft mine. This mine, which is situated near the Alabaster Cave in El Dorado county, is one of the best paying quartz mines in the State. The rock has paid steadily and will for years. The pay chute is over 1600 feet in length, the longest in the State. Rock is now being taken from the 350-foot level. The ledge at this depth is three feet in thickness.

DEVELOPMENTS continue to progress at the Gentle Annie mine at Poverty point. One crosscut just completed shows 38 feet of ore, not of high grade but uniform in character, all containing gold in paying quality. Other openings are being made along the vein, none of which has as yet been extended far enough to determine the width of the ledge. Developments already made show a continuous ore body for a distance of 1200 feet along the line. Taking into account the length and width of this ore body, and its depth from the top to the level of the proposed millsite, it would contain at a low estimate over 100,000 tons of pay material, which a mining man of known experience proposes to deliver at the proposed millsite by contract, at an expense not to exceed 35 cents per ton. The facilities for water-power and other advantages for cheap working, justifies the belief that it can be reduced at a rate but little in excess of the cost of mining.

KELSEY.—Dave Croft was over from Kelsey one day last week, and reports general prosperity on that side. Preparations are being made for active operations at the Lone Jack mine. The Big Sandy mill is running regularly. Work at the Taylor mine is progressing.

A PURCHASE.—Placerville *Observer*, Dec. 10: Luke Morgan and Jas. Kenney have purchased Jonas Bitters' gravel claim at Mt. Gregory. A fine wire cable for use in the Pacific shaft was received by the company last week. Work in the shaft was temporarily suspended pending its arrival. Work has been resumed. Work at the Chili Ravine mine is being vigorously prosecuted. The mill is running regularly and is paying handsome dividends. Recent developments in this mine are decidedly promising. Three new Huntington mills have been ordered for the Kelley mine at Kelsey. Mr. Pearson and his company mean business, and as soon as their electric plant is in position active operations will begin.

Inyo.

NOW SHE BLOWS!—Inyo *Index*, Dec. 4: The whistle at the Cerro Gordo hoisting works tooted last Saturday for the first time in ten years, the reverberating echo being regarded as a joyous note, promising a return of the good old times with a revival of the mining industry. Work began on the shaft Monday morning. It will be cleaned out and retimbered, when the Union mine will again come to the front as a leading bullion-producer.

TO HAUL ORE.—Inyo *Independent*, Dec. 6: A team of eight horses and 12 mules left Independence to-day for Cerro Gordo. They are all fine animals and will be put upon the road between Keeler and Cerro Gordo hauling ore down to Keeler and supplies up to the mines.

BONDED.—Arch Farrington has bonded two mines in the Beveridge district of Manuel Montana for $5000.

BORAX.—There is much activity in making borax in Saline valley. The capacity of the works will be largely increased soon and more than double the amount of teams will be employed in hauling the borax from the works to Alvord. Already this interest makes a good deal of business for the town of Big Pine.

Fresno.

HILDRETH.—Cor. *Expositor*, Dec. 4: Since the "Abbey" tooted her whistle for the last time, some two months ago, the bottom has well-nigh fallen out of the town of Hildreth, the boys have scattered far and wide, some to distant Mexico, some to arid Arizona, while a goodly number are still hunting the goddess, fortune, among the rough and rugged mountains of our own dear State. Yet there are beyond doubt some rich deposits here awaiting merely the influx of capital to put things in proper shape, but it seems that at present the eyes of capital are not turned this way. Mr. Jesse Morrow, a distinguished fellow-citizen of yours, hopes for big things from his mine; every morning, through the still, clear air, may be heard the music, sweet to the miner's ear, of his stamps crushing out the long-sought precious gold. Judging by the prospects, Mr. Morrow has a valuable property. Another venture has been set on foot by three enterprising spirits, Messrs. Mussel, Fitzsimmons & Zoller. These gentlemen have formed a syndicate for the working and development of that known as the "Zoller Mine." This is a well-defined four-foot ledge of quartz which averaged by actual test in the McNally mill, $15 per ton, and as all three men are miners of long experience and know what they are about, there is no doubt they will look with satisfaction on the result of their work when "cleanup" day comes. Rumors reach us that negotiations are almost completed for the sale of the Hanover mine, at present owned by H. S. Williams of Madera, to a French syndicate. Over at the Zebra, where, owing to a temporary derangement of the machinery, work was suspended for a few days, the boys have resumed business, and things are going along smoothly.

Mariposa.

THE CHAMPION.—*News*, Dec. 1: Work is progressing rapidly on the levels and good milling ore is being taken out. Free gold can be seen almost every day, and the ore is rich in sulphurets. A shed has just been built around the hoisting works. The frame of a building to inclose the engine and boiler is being put together. The arastra to be run by steam is not yet a success. The motion is too rapid. Several pounds of ore were shipped to Chicago this week to be assayed. The outlook for the Champion is very good.

RICH ORE.—Mr. C. F. Peregoy sent sulphurets from his mine at Whitlocks to the city recently to be assayed, and the returns came up this week. They show over $1000 a ton in sulphurets. These average about one per cent, that is, in a hundred lbs. of ore there is one lb. of sulphurets. There is also considerable free gold. The vein is large. The shaft is down about 50 feet. "I consider Whitlocks one of the best mining camps in the State," said a well-posted miner, Monday. "All it wants is capital to develop it."

Monterey.

LOS BURROS.—Salinas *Index*, Dec. 7: As L. Gilson, president of the Cruikshank Min. Co., passed through here on his way to S. F. last week, he interviewed Chairman Samuels on the question of a road to the mines, and was informed by the chairman of the board that there would be no trouble on that score after they had demonstrated the existence of permanent and paying mines. Mr. Gilson stated his absolute confidence in the unmistakable demonstration of that fact before spring, and Mr. Samuels said that was as soon as the construction of a mountain road could be undertaken. It is probable that the road will be built next summer. The new mill started up on the 29th ult., and worked like a charm. It is known as the Huntington pattern. Its crushing capacity is from 12 to 15 tons of ore per 24 hours. Mr. Gilson intimated that, if the Steamship Co. could land the machinery, his company would immediately erect another mill of the same capacity. The success of the Los Burros district is assured.

Mono.

THE BODIE CON.—Bodie *Miner*, Dec. 9: During the past week the upraise from south drift, 900-foot level, was advanced 17 feet. Upraise No. 2 from south drift, 1000 level, was driven 27 feet. East crosscut from shaft, same level, was extended 29 feet. There were employed 11 miners, 1 foreman, and jointly with Mono, 4 engineers, 2 firemen, 2 carmen, 1 blacksmith, 1 laborer, 1 watchman.

MONO.—During the past week west crosscut No. 2 from south drift, 1000-foot level, was advanced 16 feet. East crosscut from south drift was driven 28 feet.

Napa.

QUICKSILVER SHIPMENTS.—*Calistogian*, Dec. 4: During November last there were shipped from Calistoga, flasks of quicksilver, produced at the mines, as follows: Napa Consolidated, 395; Bradford, 125; Gt. Western, 80; Sulphur Bank, 164; total flasks, 764. The Napa Con. still produces wonderfully well, and the Bradford mine continues to yield satisfactorily. The past two months' shipments from the Gt. Western have been fair in comparison with the monthly product of last summer. The Napa Con. Co. will declare another dividend of ten cents per share at the close of the present month, making four for the year, or a total of $40,000 to stockholders during 1889.

Nevada.

PITTSBURG.—Grass Valley *Union*, Dec. 5: Since the Pittsburg mine was started up under the superintendency of Charles Stocks a considerable amount of work has been done in sinking the main incline, running drifts, and extracting of quartz by tributers. On the No. 9 level north where a good quality of ore had previously been found, further exploitations have been made which give encouragement that a valuable pay-shoot will be found in that direction. To demonstrate this, No. 10 level is now being opened and drifts have been started both north and south. The north drift is expected to strike the pay-shoot in a distance of 200 feet, where an extensive body of ore and a ledge of good size is expected to be found owing to appearances on the level above. The late crushings of the ore from the mine have been very encouraging, as the average of company and tribute rock has given a yield of $13 per ton, and the sulphurets have brought $72 per ton. The work in the mine at present is more in the nature of prospecting, but it is the intention when more new ground is opened to increase the working force of the mine with a view to keep the 10-stamp mill constantly going.

HARTERY MINE. — Grass Valley *Union*, Dec. 2: Some of the rich specimen quartz recently taken out of the Hartery mine yielded 40 per cent of gold when it was crushed. This quartz was taken from the second level south below the drain tunnel, or about 340 feet from the surface on the incline. It is from a regular pay shoot that is going down, as is shown in sinking about 10 feet below the level of the tunnel. The incline shaft is sunk 200 feet below this level, but the drifts are not opened. The shaft is now being pumped out with a view to starting a new level, which is expected to enter the pay shoot in about 100 feet. A number of tributers are now at work in the mine who are taking out good ore. The tribute force will not be increased at present. Sixty loads of quartz are now ready for crushing at the Larrimer mill, which has been rented by the company and which will be started up in a few days, when the flume which conveys water-power to the mill is rebuilt. The unfavorable weather has retarded the work. The openings in the mine will soon furnish sufficient quartz to keep the 10 stamps of the mill constantly going, unless continuous rains shall interfere with the hauling of quartz from the mine to the mill. The Hartery is showing up in the most encouraging way, and there is a strong probability of its becoming one of the most noted mines of the district. It is situated right in the center of the rich mineral belt on the west side of Wolf creek, from which millions of gold have been extracted.

THE RAINS AND THE MILLS. — If the rains continue much longer some of the quartz mines with light machinery will have trouble in keeping the water "in fork." The mines that have water-power have no cause to fear hindrance in that respect. Deep snowfalls and hard freezing weather can only knock them out.

IDAHO.—The Idaho mill is about ready to start up. The concentrators are in position, and have been put on trial for the past day or two.

THE MACHINERY STARTS.—*Transcript*, Dec. 3: The new machinery on the Federal Loan quartz claim started Monday for the first time, and it works smoothly. It will not take long to get the water out of the old shaft, which is 160 feet deep. The shaft is to be enlarged to the dimensions of five by eight feet, and will be sunk to a total depth of 300 feet before any drifting is done. The sinking and enlarging of the shaft will be completed this winter. The Federal Loan has produced very rich ore in the past, and it has every promise of becoming a paying property under the good management of Superintendent Vincent.

THE SAN JOSE MINE.—Nevada *Transcript*, Dec. 7: The hoisting and pumping machinery bought from the Centennial M. Co. will be running on the San Jose mine within about ten days. It would have been completed ere this, but the big storm blew down some trees across the road and the hauling of the rig was interrupted till the obstructions could be removed. When the machinery starts it will take about five days to pump out the water, and then the main drift will be pushed ahead speedily, while at the same time the breasting out of gravel will begin. The drift is in 400 feet from the shaft, and the channel is supposed to be about 1000 feet wide. At a point 80 feet from the shaft the rim-rock and light wash gravel carrying fine gold were encountered. This formation continues for a distance of 120 feet, and then the simon-pure blue gravel, which makes the water used in washing it look like indigo, is encountered and extends the remaining 200 feet of the drift with bedrock still pitching. The blue gravel carries coarse gold, and many nuggets worth from one to three dollars have been found by panning. Every pound of gravel shows gold. Any tenderfoot can take a panful from any point and get at least 20 colors. One pan yielded $11 worth of the royal metal. Old gravel miners say they have never seen anything that promises bigger than the San Jose mine.

SPECIMENS FROM THE COE MINE.—Grass Valley *Union*, Dec. 11: The tributers working on the 136-foot level of the Coe mine, besides getting ore that has milled $28 per load, have taken out some fine specimens that are too rich to run through the batteries. These specimens came from the ledge both east and west of the shaft, and go to prove the existence of a fine shoot of ore. This ore and specimens were taken out by Wm. Williams, James Buckett and partner, who have a tribute contract that extends to the first of January, at which time the bond of the mine, which is held by Denver parties, will expire.

SHIPMENT OF CONCENTRATIONS. — Sulphuret concentrations from the quartz mines of Grass Valley to the amount of 240 tons will be shipped this month by the Narrow Gauge railroad to the new refining works recently opened at Kenneth, Shasta county, on the line of the Oregon railroad.

Placer.

A NUGGET.—Placer *Republican*, Dec. 8: Russell Dunavent, brother of Mrs. J. M. Fulweiler, found a gold nugget near Mr. Fulweiler's barn on Thanksgiving morning. It is an unusually handsome specimen and weighs three ounces and four and one-half pennyweights. It is worth about $19 an ounce. Mr. Dunavent found the nugget while he was preparing the ground to plant fruit trees, and it was only two or three inches beneath the surface. It will surmount a pile of oranges at the citrus fair.

Plumas.

RICH BAR MINE.—Plumas *National*, Dec. 1: Alex. Buvinghausen, who owns this claim, has been doing some very efficient work upon it during the past summer. He commenced work at the mouth of Kellogg ravine and ran a cut, which is now completed, seven feet deep and five feet wide, through the bedrock, to the bank, a distance of 230 feet. In running this cut enough gold was taken from the crosscut crevices to pay the expenses of the work. He now purposes driving a tunnel from the head of the cut 300 feet into the bank, which will tap the channel seven feet lower than it has ever been tapped before. The prospects for this claim are immense.

San Diego.

HELVETIA. — Julian *Sentinel*, Dec. 3: The machinery is now being put in place and housed in, so the storms of winter won't interfere with the development of the mine. The work, which has been going slow for the lack of machinery, will now be pushed as rapidly as possible, and ere long we hope to hear the music of the stamps running on Helvetia ore.

STANLEY.—Tommy Roland is pushing work on the Stanley mine, at Banner. The shaft is now down 35 feet, with fine prospects for a good mine. It is the intention to sink 100 feet.

Siskiyou.

QUARTZ.—Yreka *Journal*, Dec. 7: Spencer & Co. of Humbug have two teams hauling quartz from their mine to the McCook mill at the forks, which will be started up this week, to be run by a steam engine secured from Scott valley. Dodge & Co. have moved their well-boring machine back to Ashland from Henley, to replace it with heavier apparatus in boring for the blue lead, as soon as the roads are in better condition for hauling. The river miners on the Klamath are still taking out considerable gold-dust, the river and weather being favorable for good working in sinking down on the old channel. The Humbug creek quartz miners are making great preparations for big work next summer, and a mining boom may certainly be anticipated, as all the ledges tested prospect exceedingly rich. Martin Andrews' claim at Hamburg on the Klamath was filled again by the last storm, which closes out work on his part for the season. He took out considerable money, realizing some $5000 in one week, but lost heavily by the great cloud-burst of August, which prevented him from getting more than even on the outcome.

Santa Cruz.

IN THE COAST RANGE.—Santa Cruz *Sentinel*, Dec. 7: The ledge on P. T. Stribling's gold mine near the Ben Lomond road was again struck the other day, and the quartz averaged $20 to the ton. Work on the mine has been suspended for the present and will be resumed in two weeks. Specimens of sulphurets of iron sent to San Francisco assay $175 to the ton.

Sierra.

GOLD.—*Mt. Messenger*, Dec. 7: The yield of the Young America for November was $23,000; Sierra Buttes, $9000; Cleveland, $1800.

BUNKER HILL.—Work has been temporarily suspended on the Bunker Hill for want of air in the breasts, but will shortly be resumed.

TUNNEL.—Hard rock has been encountered in the tunnel being run below Holland Flat by George W. Cox.

THE EXCELSIOR M. Co., at St. Louis, is raising a shaft for gravel known to be overhead.

CHIPPS. — Work is being pushed on the Chipps mine, above Sierra City, by Mr. Lock. The only thing lacking is a lot of pipe, some of which is on the way from below.

Tuolumne.

BOSS PROCESS.—*Union Democrat*, Dec. 7: The Boss continuous process of amalgamation, erected on the Golden Gate mine, is now in operation after many delays and difficulties overcome. The result will soon be known of its application to gold sulphuret ores. It has heretofore been used on silver ores on the Comstock, etc. A large steam boiler and Root blower passed through town to the Hyde mine a few days ago. The latter is to be used to ventilate the mine. Mr. Maxwell and his son arrived on Tuesday last and proceeded to the mine, where operations are being vigorously prosecuted.

NEVADA.

Washoe District.

YELLOW JACKET.—Virginia *Enterprise*, Dec. 7: Daily ore shipments have been increased to 80 tons. Battery samples show an average assay value of $21.50 per ton.

ALPHA.—The usual prospecting operations are in progress on the 500 and 600 levels.

EXCHEQUER.—The 382 level east crosscut has entered vein matter, and the 500 level north line west crosscut continues in quartz.

OVERMAN.—Mine looking well and shipping the usual amount of ore.

NEW YORK CON.—The raise above 800 level west crosscut is still showing fair-grade quartz.

CALEDONIA.—The southwest drift still in porphyry and clay.

ALTA.—Are crushing about 340 tons of ore per week, worth $29.75 per ton. During the week have sent below $22,011 in gold coin, being the net proceeds of ore concentrations for November.

CON. IMPERIAL.—North drift on the 300 level up 30 feet, with top in porphyry. Some low-grade quartz is found on the 500 level.

CHALLENGE CON.—The joint Confidence-Challenge west crosscut from the 300 level north drift is out 48 feet, 7 feet having been added during the week; face shows porphyry and quartz.

GOULD AND CURRY.—Prospecting on the 200 and 400 levels is continued in favorable ground.

BEST AND BELCHER.—Most of the prospecting is on the 625 level. West crosscut No. 1 on said level is showing a promising formation of clay, quartz and porphyry.

JUSTICE.—Mill running to its full capacity on ore that assays $20 a ton.

HALE AND NORCROSS.—On the 300 level No. 1 east crosscut is in 145 feet, with the face in porphyry and clay. The north upraise from the 1300 level is advanced 30 feet. The top shows quartz giving low assays. The south upraise from the same level is advanced 50 feet. The face shows stringers of fair-grade ore. During the week have hoisted 958 cars of ore, shipped to the Nevada mill 840 tons, and milled 840 tons. Total number of tons milled last month, 3900; average battery assay, $30.10.

SAVAGE.—During the past week have hoisted 500 cars of ore and shipped to the Rock Point mill 437½ tons; average battery assay, $28. Have not received final cleanup from the mill for last month's crushing. We are extracting ore from the 400, 500 and 750 levels. Have men employed on repairs and prospecting the several levels.

CROWN POINT.—The north drift on the 400 level, ninth floor west, is in clay and porphyry. The pay ore has been cut out in that direction. Nothing new to report of the stopes elsewhere. Shipped to the mill during the past week 960 tons and 1410 pounds of ore, the average battery assay of which was $17.75 per ton.

BELCHER.—Low-grade quartz is showing on both the 1000 and 1200 levels. On the 850 level the south drift is in clay and porphyry. It begins to show a little water.

SEG. BELCHER.—The usual prospecting operations are in progress on the 1200 level.

UNION CON.—The west crosscut from the north lateral drift on the 1465 level is in porphyry that contains some clay "slips."

MEXICAN.—The west crosscut from the north drift from west crosscut No. 1, on the 1465 level, continues in a vein material composed of quartz, clay and porphyry.

OPHIR.—On the 1300 level from the end of the east crosscut from the shaft station, a south drift is advanced 93 feet. Formation, porphyry and quartz.

CON. CALIFORNIA AND VIRGINIA.—From the stopes on the 1300, 1435, 1500, 1600 and 1650 levels continue to extract ore sufficient to supply the Morgan and Eureka mills. The ore breasts on the 1650 level continue to look well, and are yielding the usual quality of milling ore. The average battery

samples will probably be about the same this week as last, *i. e.* $26.

UTAH.—The southeast drift on the 600 level continues in vein material composed principally of porphyry and clay.

OCCIDENTAL CON.—Sufficient ore is being extracted to keep the mill fully employed. The average of the pulp assays remains about $17 a ton.

NORTH OCCIDENTAL.—The 300 and 400 levels continue to look well and are yielding the usual amount of ore.

SIERRA NEVADA.—On the south drift from the main east drift a drift is out about 140 feet. It is being advanced in a favorable formation of porphyry and clay.

POTOSI.—There is still a good deal of ore showing in the drift on the 800 level as it advances, but it is not of high grade.

EAST SIERRA NEVADA.—The south drift on the 520 level is making the usual good progress.

CHOLLAR.—The ore-producing sections continue to look and yield well. The amount of ore crushed weekly at the Nevada mill is about 400 tons. On the 500 level and in some other parts of the mine the work of prospecting is still continued.

Blind Mountain District

SILVER ORE.—Pioche *Record*, Dec. 1: Wednesday Jimmy Clark was in from Blind Mountain district, where he has been working for a long time past. He recently shipped nearly a carload of ore which assayed up in the hundreds in silver.

Ely District.

PLACER MINES.—White Pine *News*, Dec. 1: There has been considerable excitement in placer locating during the past week. The whole of Robinson canyon, the town of Ely, and down as far as McQuitty's have been taken up. In all the prospects made, coarse gold in paying quantities has been found. It now looks as if Ely's placer-fields would, at no distant date, show up as promising as those of her sister camp Osceola.

THE JOANNA BONANZA.—White Pine *News*, Dec. 1: We took a drive up the canyon a few days ago to take another look at the Joanna mine. We found three men quarrying out the hillside on a breast 100 feet or more, and keeping two teams steadily at work hauling to the mill. The only waste on this breast of ore is about a foot of sagebrush and loose gravel that is stripped from the slanting surface of the hill. The grade of the ore has raised from $30 to $40 a ton. Mr. D. C. McQuitty, an old California miner, who accompanied us, was greatly astonished at the immense mass of ore in sight and said that in all his experience in California he never saw anything like it. It is a mountain of high-grade gold-bearing rock which promises to contain millions of the most precious metal. Every one who sees it is astonished at its great mass and high grade. Already numerous offers are coming in from mining men looking to a purchase of the property, but Mr. Watson, knowing he has a good thing, is not at all anxious to part with it. We are reliably informed that a bond for 30 days and $100,000 with a forfeit of $10,000 has been refused by Mr Watson. We are not in a position to say what exact value Mr. Watson places upon the property, but it is probable that not less than half a million dollars would induce him to sell, and the company that gets hold of it at that figure we should consider lucky. The Joanna is a great property, and, whether sold or worked by its present owner, is almost certain to last for many years and pour out a constant supply of the most valuable metal known to commerce. That there are other equally as good mines in this district all indications seem to warrant, when explored and opened up.

Eureka District.

ORE SHIPMENTS.—Eureka *Sentinel*, Dec. 7: During the week the following named companies made shipments of ore to Salt Lake City, viz.: Diamond mine, 63 tons; Bullwhacker, 58 tons; Jackson, 44 tons; Matthewson Bros., 24 tons.

Freyburg District.

ASSESSMENT WORK.—Belmont *Courier*, Dec. 7: George Ernst and Michael Colligan are doing assessment work on Mr. Ernst's mine in Freyburg district.

Harrison District.

GOLD.—Lyon County *Times*, Dec. 3: Harrison District is in Mason valley, about two miles northwest of the town of Greenfield, and gold was discovered in the district a little over a year ago by Pat Gallagher. Soon after the first discovery was made the surrounding hills were rapidly staked out into claims, and a number of locators did quite a little work on their claims. Three well-defined ledges were discovered. On the first ledge is the Harrison claim, owned by Pat Gallagher, and south on ledge No. 2 is the Cyclone claim, owned by Watkins, Mullen and McGowan, while still south of this claim, on ledge No. 3, is the Sunday claim, owned by Barton, Cooper and Emmerson. The Harrison and Sunday claims have had the most work done on them, and for the past month the owners of the latter have been at work on their ground. Pat Gallagher started work on the Harrison on the 2d of this month and will continue the work during the winter. Two inclines have been sunk on the Harrison to a depth of 35 feet, and in one, drifts have been run each way on the ledge to a distance of about 30 feet. The ledge is about four feet wide and the gold is free. Assays show the ore to go from $15 to $28 per ton, and the gold is worth about $18 an ounce. Mr. Gallagher will have a sample lot of the ore from the Harrison worked at some mill on the Carson river as soon as he can have it taken out.

Jefferson District.

SILVER.—Belmont *Courier*, Dec. 7: Thomas Warburton brought in a very rich specimen of silver ore from Jefferson on Tuesday last. It was extracted from one of the ledges in the Harrison mine, and assays $1 to the pound. The Harrison Bros. had 1000 pounds of this class of ore in sacks when Mr. Warburton left Jefferson for Belmont.

Silver Park District.

RICH ORE.—Pioche *Record*, Dec. 1: J. B. Gilbert and John Wagener have shipped a carload of rich ore from the Hassampie mine, in which they recently made a strike while chloriding. At last accounts the ore has widened to two feet.

Tuscarora District.

PROSPECTING.—*Times-Review*, Dec. 3: There is a great deal of prospecting going on in this district. Many of the miners who are unable to obtain work at day's wages are sensibly putting in their time upon locations of their own, and the probabilities are that a number of paying properties will be developed before the opening of spring.

DIANA.—*Times-Review*, Dec. 7: Have started work in east crosscut No. 2, 300-foot level from the North Belle Isle.

BELLE ISLE.—South drift from west crosscut, 250-foot level, extended 10 feet. The face continues in vein.

NAVAJO.—Work in the mine has been continued to the stopes above the 150-foot level, which shows some high-grade ore.

GRAND PRIZE.—North crosscut on the 500-foot level extended 13 feet without change. A winze has been started on the south 400-foot level drift and sunk eight feet; bottom showing two feet of concentrating ore.

DEL MONTE.—East crosscut No. 1 from north drift, 225-foot level, extended 10 feet. Joint crosscut, same level, extended 12 feet. East crosscut No. 2, 100-foot level, extended 20 feet; the face is still in the vein.

NORTH COMMONWEALTH. — Joint crosscut, 225-foot level, extended 12 feet; the face shows well. The crosscut west from the end of the south drift, same level, has been extended 16 feet in the vein. A crosscut has been started east from the same point.

NORTH BELLE ISLE.—North drift, 600-foot level, is in 38 feet from the shaft. The rock is hard with seams of spar giving low assays. The crosscut from the 300-foot station has been extended 23 feet; face looking favorable.

NEVADA QUEEN.—South intermediate drift from Commonwealth 150-foot level has been extended 11 feet. From this drift a crosscut has been run into the hanging-wall a distance of 18 feet. The ore is too low grade to pay and the miners have been put to work in crosscut 120 feet east.

COMMONWEALTH.—100-foot level: No. 1 east crosscut extended 19 feet and has improved in quality, showing some high-grade ore. No. 2 east crosscut advanced 18 feet; face in the vein giving low assays. No. 1 west crosscut has been run 21 feet. A drift has been started from upraise in north drift; average assay from ore extracted, $261 per ton. 150-foot level: East crosscut from No. 11 drift extended 17 feet; total, 45 feet. North drift from No. 14 upraise extended 14 feet and continues to develop good ore. North drift, 50 feet east of No. 14, advanced 10 feet, following ore; average, $88 per ton.

ARIZONA.

QUARTZ MOUNTAIN.—Arizona *Journal-Miner*, Dec. 4: An abundance of water in the Hassayampa will enable the Quartz mountain mill to start up on full time. As they have also an abundance of good ore out, this property will soon range itself in the list of bullion-producers. Twelve tons of the richest ore yet taken from the Catoctin mine were shipped this week.

BIG BUG.—A deed from the Big Bug Mining and Reduction Co. for 18 mines in Big Bug district has been filed for record in consideration of $250,000. By this transaction the former company virtually ceases to exist, and the company becomes known by the latter name, a company incorporated under the laws of the State of New York. The reason given for the change is stated to be that the former name of Big Bug had an entirely different and more significant meaning to New Yorkers than it had in Arizona. Over 21,000 pounds of ore were received at the sampling works Wednesday.

DAKOTA.

UNCLE SAM CLEANUP.—Deadwood *Pioneer* Dec. 5: Cleanup from the Uncle Sam for November's run has not yet been brought in for shipment East. A *Pioneer* reporter was told yesterday, however, by a gentleman in position to know whereof he spoke, that the bullion secured will be worth nearly if not quite $20,000. This amount would be even better than the public and perhaps stockholders had looked for. Until November 16th but 20 stamps were dropping; since then 10 more have been let loose. Therefore, $20,000 would indicate that the quality of ore has improved greatly, and also that operations for the future will be profitable enough to soon warrant payment of dividends.

BLUE BIRD.—While doing annual representation work day before yesterday, miners employed by the Blue Bird Co., Ruby Basin, struck a body of very good ore. Stockholders were somewhat excited about the matter yesterday, and look for great things in a very little while.

COLORADO.

REDUCED FORCE.—Aspen *Times*, Dec. 3: Following the temporary discharge of the main force employed on the Aspen mine, the Compromise Co. has also cut its force down to a mere handful. This action results entirely from the condition of the ore market. D. R. C. Brown, in talking about the matter, stated that, so far as the Aspen mine was concerned, there was no other reason whatever connected with the shut-down besides the condition of the market for the product. He fully expects that satisfactory contracts will be made during the month and that the mine will start up again with a full complement of men by Jan. 1st. A force of about 30 men is now employed. The Compromise has only been employing 60 hands since the product was cut down some two months ago. The conditions surrounding it are exactly like those that affect the Aspen.

STRIKE IN THE MONARCH.—It is difficult to secure definite information regarding the strike in the Monarch, but it is pretty well settled that one of the most important discoveries of the year has been made in that property. The ore was first found on that part of the territory which is claimed by the Cora L., and, in following it down into the undisputed ground, it has opened out wonderfully. The ore body is declared to be very large and of a superior grade.

THE J. C. JOHNSON.—Some very important developments are now being made in the J. C. Johnson. At a point 650 feet north of the main incline a second incline is being run following the chute of lead ore found in that part of the mine. The incline starts from the fourth level, the fifth being used as a sump. It has reached a point 150 feet under the fourth level, or 56 feet under the fifth, and the sixth level has been started. It is in this that the recent developments have been made, the most important feature being an 18-inch streak of high-grade lead ore. This runs 40 per cent lead and away up in silver, being the best mineral ever found in the mine. The importance of this discovery lies in the fact that it shows that the ore increases in grade as depth is gained. This has been shown at every other point along the Aspen belt, and the further demonstration in the Johnson is highly interesting.

ORE SHIPMENTS.—*Idaho Springs News*, Dec. 6: Ore shipments from this place for the month of October aggregate 2,849,000 pounds, while the shipments for November amounted to 2,704,550 pounds. The Mixsell mill has resumed operations after a suspension of a couple of weeks on account of the cold weather. The mill is making piles of concentrates. The Idaho Custom mill, under the management of J. C. Holmes, continues to do good work. Three batteries of stamps are kept pounding steadily on ore from the Grover Cleveland. During the month of November the Lamartine shipped 40 carloads containing from 12 to 15 tons of ore. The lessees, Hanchett, Burns, Williams and Armstrong, each pocketed about $10,000 after paying all expenses, as a result of the month's product.

IDAHO.

ORE SHIPMENTS FROM HAILEY.—Wood River *Times*, Nov. 15: During the year ending Sept. 1, there were 151 carloads of ore, weighing 4,271,175 pounds, shipped from Hailey. This is an average of about 28,286 pounds to the car.

THE BLACK CREEK MINES.—Boise *Statesman*, Dec. 1: Arthur Neal was in the city yesterday, at the Overland Hotel, and a reporter interviewed him for the purpose of obtaining reliable news from headquarters concerning the Black Creek mining region. Mr. Neal was in a communicative mood, and stated that there have already been 40 or so quartz locations made in that vicinity. The district lies in Elmore county two miles east of the Ada county line, and to get there one has to travel only a distance of 21 miles east from Boise City. Mr. Neal individually owns the Homestake and Mountaineer locations, and is co-owner with Mr. George House in the Rover, Humming Bird, Bertha, and Washington claims, the latter being an extension of the Homestake, which lode is 100 feet wide on the croppings, the ore from which runs on an average by assay of $50 per ton.

CŒUR D'ALENE DISTRICT.—Wardner *News*, Dec. 1: The placer interests on the North Side have a stanch friend in Syd Mills, who continues operations in a very systematic manner, proving incontestably the vast amount of gold contained in the claims purchased and operated by him. He keeps a force of 12 men under the superintendence of Ben Stahl, piping on the Robinson claim and on ground adjoining on Fancy gulch. He is also doing a large amount of assessment work, employing an equal number of men on Eagle creek, five miles above Eagle City.

LALANDE DISTRICT.—The concentrator of the Tiger mine which was closed down for some weeks for repairs and the introduction of new machinery, was started up again on Friday, the 22d, under the supervision of A. B. Campbell, who has been appointed receiver for the property.

A LEASE.—Ketchum *Keystone*, Dec. 7: Messrs. Philbrick, Harlan & Williams have secured a lease of the Nabob mine at Galena. Two teams—one six-horse and the other a two-horse team—left Ketchum last Wednesday with sleighs loaded with about 5000 pounds of supplies for the mine. The Nabob is considered a very good prospect. A lot of ore from the Tyrolese mine was brought to the Ketchum sampler this week which yielded 126 ounces silver, $30 gold and 45 per cent lead per ton. Ore shipments continue well as compared with this month of previous years, and several leasers of good properties in this vicinity are arranging now to continue shipping ore all winter.

LOWER CALIFORNIA.

ALAMO GOLD.—*Nugget*, Dec. 5: The purchases of gold-dust for November as reported by Smith & Edwards, Aldrete & Romero, Carillo, Venn and others indicate that the placer yield for the month was from $250 to $500 more than for October. About $5500 is a fair estimate. Doc. Breckon and Jack Barnes have struck another lot of rich ore in the 26-foot drift of the Asbestos. Sierra's cinnabar prospect on Mt. Alamo is scooped in by the 10,000 meter grant of the tunnel company. The heavy rains we are now receiving ought to increase the placer yield for December in Alamo district to $10,000. The dry washers are taking a rest these moist days. The water-loving prospectors are engaged in looking over the mountains and mesas. Several blasts this week in the A. H. Butler indicate that Mr. Hughes and the boys are getting ready for another run at the little five-stamp mill.

MONTANA.

TO RESUME.—Butte *Miner*, Dec. 4: Since the advance in the price of copper several properties which have in the past produced a vast amount of copper, but which had to close down when the metal became cheap, are now getting ready to resume operations. The principal one of these is the Ramsdall-Parrot. This mine now has a 400-foot shaft, from which crosscuts and levels have been run. The lead is the same one as that on which the Parrot is located, and the product will in future add greatly to the copper and silver output of the camp.

SUSPENDED. — *Inter-Mountain*, Dec. 4: The Elm Orlu has suspended operations for the past two weeks, having lost the lead at the bottom and the upper workings having been entirely worked out. In the past this mine has produced some very fine and exceedingly rich ore. The company are at present running a drift from the 300-foot level of the Black Rock that is considerably lower than the Elm Orlu, that will have to be run at least 600 feet to determine if the Elm Orlu is really on the vein as originally supposed, and if such be the case and an ore body is cut, it will be entirely worked through the Black Rock shaft.

THE ANACONDA SMELTER. — *Inter-Mountain*, Dec. 6: The Union Pacific has been rushing coal into Anaconda at a lively rate for the past few days, and the prospect for a constant supply of fuel is such that the upper smelters of the company began work last evening and are now in full operation. The company has made a large increase in its coal order, and intends to provide at great expense storage capacity for the extra coal received, so that in the event of a snow blockade this winter, or a temporary stoppage of railroad operations for a short period, a shutdown of the smelters will not be necessary. The big new smoke-stack at the upper works is a success, and carries all the smoke over the hills to Lost creek and keeps it out of the town of Anaconda. At the mines of the Chambers syndicate the forces have been increased to such an extent that ore can readily be produced sufficient to keep the smelters in constant operation. At the Anaconda and St. Lawrence there is no change to report, though it is expected that the mine will be opened within 24 hours. There are no indications of fire in either shaft.

NEW MEXICO.

DEVELOPMENT WORK.—Silver City *Enterprise*, Dec. 7: James Kerr and Paul Mitchell have secured a lease on the Timmer mine, Cow Springs district, and will soon be taking out plenty of ore. M. W. Bremen is improving the road leading from his mine into town. It will shorten the distance to the mine by a mile and a half, and will enable the teams now at work to deliver 150 tons per month more than over the old road. John A. Miller has a lease on the Telegraph mill and will haul ore there from the Nugget mine, Carlisle, for treatment. The Carlisle Co. has let out 15 miners in the past week. The Frue vanner recently ordered by the Humboldt Co. of Shakespeare has arrived, and is being put in position in the mill. Sil Gamblin has purchased a one-half interest in the Red mine, at Pinos Altos, from Mr. Robinson. A force of men is now at work in the mine. W. C. Tonkin informs the *Enterprise* that a force of men has been put to work on the Canyon Gold Co.'s property near Clifton. Work will be pushed and a mill erected soon. Work on the Grand Tower group at Gold Hill is progressing satisfactorily. A considerable body of carbonate ore has been discovered, which it is thought will average $200 in silver and over 20 per cent lead. A lease has been secured on the upper levels of the Golden Giant, at Pinos Altos, by J. W. Clark. The double-compartment shaft will be timbered from top to bottom, a distance of 280 feet, after which several contracts will be let to extend the various drifts and the sinking of the main shaft.

OREGON.

CORNUCOPIA.—Bedrock *Democrat*, Dec. 7: There is at present between three and four feet of snow at Cornucopia, and the indications point strongly to the heaviest fall this winter ever known in that locality. At Cracker City there is more snow now than there was all last winter. In the Greenhorn and Granite mining sections there is already an abundance of snow. The same can be said of the other mountain sections, and not only the miners but every person in Baker county is in consequence happy at the prosperous outlook for a great water supply the coming season.

GREENHORN MOUNTAIN.—*East Oregonian*, Dec. 7: B. L. Duncan arrived on Sunday from the Greenhorn mining section, via Baker City. Mr. Duncan reports three feet of snow in the Greenhorn mountains, and mining operations comparatively at a standstill on account of the winter having set in. Mr. Duncan reports this to be a wonderful mining country, there being so much rich ore in sight. He brought samples down from a number of mines in that section. He says J. H. Mitchell, owner of the Virginia mine, has met with great success of late, and is doing more work in his mine than any other one man in the mining district. He has already worked up 100 tons of ore from which he has realized handsomely; has another hundred tons on the dump, and from 500 to 1000 tons in sight. The Phœnix, owned by the Berry Bros., is turning out well. They have an arastra and work their own ore.

UTAH.

STRIKE IN THE WOODSIDE.—Park *Record*, Dec. 7: For some time past the Woodside company's workings have been of such a nature that people in local mining circles have been on the tip-toe of expectancy for some good news from this bonanza property. The news is ripe, for a very important strike has been made. During the last four months operations at the mine, under Supt. Chas. H. Gitsch, have not been confined solely to cleaning up and shipping the ore left by the leasers, but also to driving two crosscuts in the direction of where it was expected a north vein would be encountered. This vein was cut on Tuesday and a fine body of ore is exposed which has not yet been driven entirely through. The vein lately encountered is large and rich, and the ore is of about the same character as what made the leasers wealthy.

ACTIVITY AT THE ANCHOR.—Pursuant to the terms of the contract awarded to W. W. Dull, an Eastern oil man of 25 years' experience, the work of boring an eight-inch hole from the bottom of the Anchor shaft to the tunnel level will be commenced the coming week. The machinery and drill are now here and they are now being set up. There can now be no question about the success of this enterprise. As soon as the hole is down, the mine will drain itself, and then the shaft, at present 600 feet deep, will be sunk to the tunnel level, which is nearly 1200 feet from the surface. When the shaft connections are complete the numerous veins of ore in all this vast space will be opened up to great advantage. Since the work of getting the boring machine ready was started, work on the crosscuts has been stopped, and Thursday morning the men commenced drifting on the veins from the tunnel level. Teams also commenced delivering the second-class ore to the Union concentrator, and the concentrator started to treat it yesterday. The operations at the Anchor are in charge of Wm. M. Curtis, the efficient superintendent.

THE ONTARIO SHAFT.—The deepest workings of the Ontario are now at 1320 feet, or rather that is the depth of the No. 2 shaft. Drifting to cut the vein on the 1300-foot level is being pushed, and the work of sinking the shaft to the prospective tunnel level, 1560 feet deep, will be resumed ere long. The water is easily handled.

CAMP CROSSCUTS.—A shipment of bullion is being made up at the Marsac mill. The vein opened up by the leasers of the Creole No. 2 continues to get richer. Ore is being sacked for shipment. The Ontario bullion shipment for the week was 38 bars, containing 19,538.55 fine ounces of silver. Col. Ferry's shaft on the North Pole claim is down 50 feet, to bedrock, from whence drifting to cut the vein is in progress.

MECHANICAL PROGRESS.

American Screw Machines in England.

A late number of London *Iron* makes the following notice of a roller screw machine which has recently been introduced into the works of the American Screw Company at Providence, Rhode Island:

These machines—one for forming the blanks and the other for rolling the screw-threads—have been recently brought over to this country [England] and we have just been afforded the opportunity of witnessing their satisfactory working. The blanks are formed from a coil of wire of the necessary gauge. They leave the machine with the head, the slot, and the point fully developed, at the rate of from 50 to 60 per minute in regular working. From the blank-forming machine the blanks are taken to the threading machine, and are placed en masse in a revolving tray, from which they are fed automatically into the body of the machine. Here they come between a pair of fluted dies which are made to traverse past each other in a horizontal direction. The dies roll the blanks in succession between them, the thread being thus formed, the finished screws dropping from the dies at the rate of 54 per minute. Upon the occasion of our visit the working of this latter machine was made comparative with an ordinary screw-cutting machine. The ordinary machine was set to work on 1½-inch blanks of No. 9 gauge, the threads being cut in the usual way, and the screws being turned out at the rate of seven per minute. The American machine was then started on blanks of the same length and gauge, the finished screws being turned out at about the rate already stated. The finish was all that could be wished, while the rate of production as compared with the ordinary machine renders comment superfluous. But the rate of production is by no means the only advantage arising from the new system of manufacture, there being many points of improvement in the screws thus formed. The following claims are advanced for these gimlet-pointed rolled wood screws: (1) Superior point, centralizing the screw, and enabling it to enter the wood straight. (2) A deep, thin thread, having a greater hold and not distorting the fibers of the wood. (3) A small shank, which avoids splitting the wood, and requires but one boring for hard wood. (4) The use of a tough material, and the absence of a weak place in the screw.

Besides the screws we have been describing, we were also shown some new drive-screws. These screws have a very quick thread, which facilitates their advance into the wood, into which they can be driven clean home by a hammer, and extracted like ordinary screws. Hitherto the cost of manufacture of these screws has prevented their wide adoption. In order to secure a good hold of a screw, it is essential that the fibers of the wood should be as little broken up as possible by the entrance of the screw. In driving a screw of the ordinary type into wood with a hammer, the fibers are so broken up by the screw-threads that the holding capacity of the thread is greatly reduced, and even where threads of steep pitch are cut into wire, the waste of material and reduced strength counterbalance, to a great extent, the holding capacity due to the spirally formed threads. A nail or screw forces its way into the wood, and its holding power depends more directly upon the shape and condition of the walls of the cavity formed by its entrance than it does upon the tensile strength of the metal itself, which is generally more than sufficient to resist any direct strain brought upon it. The American company's drive-screw is capable of forming a cavity which, as to the strain upon it and its withdrawal, acts like a nut to a screw. The walls of this cavity are made up of the compressed fibers of the wood, instead of disintegrated fibers which result from driving ordinarily.

These screws are made by special machinery designed by the American Screw Company, and which forms the screw by swaging and rolling. This drive-screw can be forced into wood by the blow of a hammer, makes its own nut as it descends into the wood into which it is driven, and may be withdrawn from the wood by turning with a screw-driver in the ordinary way. This was demonstrated at our recent visit, the screw being seen to give a partial turn at each blow of the hammer. The cold-rolled screw machines are being introduced in this country by Mr. Wm. H. Reynolds, Bartholomew House, Bartholomew Lane, London.

THE LAW OF GRAVITY IN THE MANUFACTURING BUSINESS.—It is now recognized in New England that there is really such a law, and that it has a tremendous force and never fails to be executed. Mechanics and capitalists are equally concerned to know what is the scope and meaning of this law, and then to study carefully its relation practically to their business as craftsmen or as employers or masters. In New England it is rapidly beginning to be felt that the manufacture of cotton goods must eventually be carried on near the place of production, and hence a general rule is being formulated that in the near future raw materials must be manufactured near the place of production, if any money is to be made in the operation. Already an edge-tool company in Maine has begun the erection of a branch factory in the metal region of the South, and this is by no manner of means an isolated instance. Year by year the competition in business is becoming more and more serious, and common prudence seems to demand that a very thorough study of the situation should be made. If the cotton manufacture shall in the next twenty-five years center chiefly in the South, or the metal manufacture nearer the source of supply, and otherwise the factory approach the place where raw materials are produced or found, it by no means follows that the North may not have some equivalent to take the place of cotton, or New England some factories to work other productions than iron. The genius and skill of our inventors and artisans will rapidly find out the industries and manufactures for any given locality, and so the real balance will be properly kept, while the prime cost of production will be lessened. The warning has been plainly heard all along the line, and capitalists will study the situation more carefully than ever, and discriminate with greater closeness before selecting the particular direction in which to spend time and money.—*The World's Progress.*

New Foundry Practice.

We have been asked the question several times recently, "What are foundrymen now doing who have always insisted that they were obliged to have some Scotch pig-iron as part of their mixture?" The great advance in prices abroad of course prompts the question. Foundrymen who have been interviewed on the subject give various answers. Some, especially in the East, have still on hand or under contract a supply which covers their immediate requirements. What they will do when that is exhausted they leave for the future to determine. Others, and a far more numerous class, have cut loose from Scotch pig-iron entirely, using in its place Ohio softeners of practically the same characteristics, realizing the same results. They will probably not return to the use of Scotch pig-iron again unless radical changes, now most unlikely, should occur in the iron market here and abroad. But the great majority of our foundrymen have cut loose from all past practice and are making satisfactory mixtures with Southern soft grades or Northern high-silicon irons. We have recently been shown numerous specimens of difficult foundry work made by enterprising molders, in which not a pound of Scotch pig or any other special softener had been used. But a few years since such work would not have been attempted without a most carefully compounded mixture. Present foundry practice is in the direction of the intelligent use of pig-iron according to its own chemical constituents and without the blind adherence to tradition which involved a constant reliance on one particular kind of iron as part of the mixture.—*The Iron Age.*

A NEW STEEL PROCESS.—Some stir, says the Chicago *Journal of Commerce*, has been made in that city during the past week anent the promulgation of a process, invented by two gentlemen of Kentucky, which it is claimed will speedily change low-grade steel into tool metal possessing a high degree of superiority. The method embraces a bath containing glycerine and several hydrocarbonaceous substances dissolved in water. The low-grade steel is brought to a white heat, then plunged into a bath and permitted to remain until cool. The heated metal in the bath sets free certain hydrocarbon gases which are absorbed by the steel, and by the time the latter has cooled, chemical and physical changes have taken place in its composition and transformed it into a hardened, high-grade, impenetrable steel. This process is known as the Redeman-Tilford, and as such is already known among iron men. Great things are claimed for it, and these claims, it is alleged, are supported by careful tests.

BLACKSMITHING A LOST ART.—Blacksmithing may very properly be classed among the lost arts. The hammerers in iron of to-day do not possess a tithe of the skill of their seventeenth century brethren, and even of an earlier date. At the Birmingham museum and art gallery is a lobster executed in hammered iron, a piece of ancient Japanese work and supposed to be the specimen work of an armorer. All the articulations had the exact movements of its natural prototype, and were equally close and nicely fitted. At the Paris art gallery there is a gate made in the seventeenth century by a blacksmith, every part of which was hand-forged or hammered. It is made in the form of the limb of a tree full of leaves, and every leaf is as perfect as nature forms it. A close examination showed that no file or other finishing marks had been used in the perfection of these works of art. It may well be doubted if there is a hammersmith in the world who could duplicate these specimens to-day.—*Ex.*

A MAMMOTH GLASS ENTERPRISE.—Eastern and Pittsburg capitalists are about to inaugurate a great glass enterprise near Pittsburg, Pa. The invested capital will be $3,500,000. On a tract of 500 acres, embracing one and one-half miles of river front in the Monongahela Fourth Pool, there will be erected, among other factories, plate glass works 1500 feet long, and employing at the outside nearly 3000 men. The purchase price of the tract was $250,000, and deposits have been made.

YOU cannot dream yourself into a character. You must hammer and forge one for yourself.

SCIENTIFIC PROGRESS.

Japanese Art.

At the opening of the Annual Exhibition of the School of Design of this city, on the evening of the 4th instant, the Alvord gold medal for excellence in oil painting was awarded to Oroka Soyeda, a young Japanese student. Another Japanese, Mr. Takahoski, was awarded honorable mention for excellence of sketches in water-colors, both in figures and landscapes. After Mr. Soyeda had received his medal, a little girl from the audience ran up to him and presented him with a handsome bouquet, which he received with manifest delight. The second and only other gold medal was awarded to Miss Isabel Hunter for excellence in drawing.

The Way a Japanese Artist Works at Home.

The following sketch of the manner in which Japanese artists work in their own country will be read with interest in connection with the above. We copy from a late number of the *Magazine of Art:* The technique of Khiosi's work was most fascinating. I had come away from England with all sorts of theories concerning the technical part of an artist's work, and when I got to Japan I found there was absolutely nothing that was not known by that man. This fact is as remarkable as it is true. His method of work, too, interested me exceedingly. To begin with, the assistant brought his stretcher of silk—a lovely piece of silk stretched across a wooden frame—and placed it in front of him. Then, taking a long, burnt twig, he thought for a few minutes, looking all the while at his silk—thought out his picture, indeed, before he put a single touch on his canvas. How different is this from the man who so often, with us, puts on a lot of hasty touches in the hope that they will suggest the picture!

When this Japanese saw his picture completed in his mind, he began with the little burnt twig to trace a few sure lines. I never saw such facility in my life. A few swift strokes indicating the outline on the silk of two black crows, then he took up his brush and began at once with the Indian ink, with full powerful color, and in about seven minutes he had completed a picture, superbly drawn and full of character—a complete impression of two black crows, very nearly life-size, resting on the branch of a tree.

Khiosi never under any circumstances repeats himself; every picture he paints is different, while for his work he asks but a small price. Captain Brinkley told me of an incident which well illustrates the man's character. A member of one of the foreign legations had invited Khiosi to come around and sketch on the floor at an evening party to himself and a number of Europeans. Khiosi refused absolutely, although he was to be paid enormously well for his work, because he said he felt he would not have a sympathetic audience.

After he had done his crows, he painted a colored picture, beginning with Indian ink. First he tried all his colors, which were ready prepared in different little blue pots and placed all around him. These little shallow pots, or saucers, had each its own liquid, which the assistant had prepared to a certain extent beforehand. They contained flesh tint, drapery color, tones for hair, gold ornaments, and so forth. These colors had evidently been used before, as they were in their saucers, merely requiring dilution before immediate use. The saucers were arranged chiefly on his right, with a great vessel of water, of which he used a great deal. All his utensils were scrupulously clean. When he began there was no fishing for tones, as on the average palette. No accident! All was sure—a scientific certainty from the beginning to the end.

The Carboniferous Era.

Buried in the depths of the earth, distributed all over the globe, and in total quantity beyond the ability of the human mind to conceive, and almost beyond its power of computation, lie the skeletons of forests which covered the earth for, perhaps, millions of years, during that early period called by the geologists the carboniferous. During a long interval of time the globe was covered with a warm, moist, misty atmosphere, rich in carbonic acid, the food of the vegetable kingdom, and its soil was kept warm and productive by the conjunction of the heat of its internal fires with the caloric received from the sun and held encaged by this atmosphere, which is known to have the property of permitting easy transmission of the rays of the sun to the earth, while strongly resisting their return into space. Under such circumstances the growth of vegetation took place with a rapidity unknown even in the tropics of to-day; the earth became covered with forests; forests grew on the relics of early vegetation; millions of square miles of soil were composed of the trunks, the branches, the leaves of tropical plants, the stems of gigantic ferns, the masses of enormous moss; while the sea was clogged with marine vegetation, the growth of which was stimulated by a steady and uniform warmth extending from the equator to the poles.

Higher animal life could not exist amid this atmosphere of mixed air and carbonic gases; but the lower forms swarmed throughout the world. Thus heat, moisture, and carbon-supplying compounds conspired to provide a wonderfully gigantic and rankly-growing vegetation, and the progress of ages saw the rise and the fall of measureless quantities of woody material, which was finally spread over the earth, to form, by later consolidation, and by the elimination of volatile constituents, those apparently inexhaustible stores of fuel now an essential element of human life and civilization. The partial decomposition of the animal and vegetable juices and fiber produced the petroleums and the unimagined quantities of compressed gases, which are just coming into use for fuel and light in many parts of the country—a hitherto unsuspected reserve. This process of production and storage of fuels of such strange variety of condition and composition is now known to have been a system of reception and storage of a minute part of the energy, the work-power, that the sun and the subterraneous fires of the earth were lavishly and wastefully distributing in all directions into space. Every pound of the carbon thus stored away for the use of the human race in the millions of years succeeding the millions that should elapse before its appearance on the globe, is now known to hold in "potential" form, as the man of science puts it, 14,500 thermal units of heat.—*Prof. R. H. Thurston.*

WHY FLOWERS SLEEP.—It is to give busy insects a chance to fertilize them. That flowers sleep is evident to the most casual observer. The beautiful daisy opens at sunrise and closes at sunset, whence its name, "day's eye." The morning-glory opens its flower with the day. The "John-go-to-bed-at-noon" awakes at 4 o'clock in the morning, but closes his eyes in the middle of the day, and the dandelion is in full bloom only during the hours of strong light. This habit of some flowers is certainly very curious, and furnishes one of the many instances which prove the singular adaptability of everything in nature. The reason is found in the method by which this class of flowers is fertilized. It is obvious, says Sir John Lubbock, that flowers which are fertilized by night-flying insects would derive no advantage from being open by day; and, on the other hand, that those which are fertilized by bees would gain nothing by being open at night. Nay, it would be a disadvantage, because it would render them liable to be robbed of their honey and pollen by insects which are incapable of fertilizing them. It is possible, then, that the closing of flowers may have reference to the habits of insects, and it may be observed, also, in support of this that wind-fertilized flowers never sleep.—*Jewish Messenger.*

THE COLOR OF THE EIFFEL TOWER, says the *American Architect*, has been one of the puzzles of the Paris Exposition, no two persons agreeing as to what the real color is. Some people imagine that it has been plated with nickel or silver, while others call it red, and others, again, think it is of a beautiful bronze color. The fact is that it is painted in five shades of the same color, modulated with the skill that the French often show in cases of the kind. From the base of the first platform the color is a dark "Barbedienne" bronze, verging a little to red; thence to the second platform the color is the same, but lighter; and from this point to the top the color grows constantly lighter, by five successive gradations, the top being almost a golden yellow. Three coats of paint are spread over the entire surface, and over all is a coat of very hard, transparent varnish, which, by reflecting the sun, adds to the difficulty of defining the color.

DANGER FROM "FLASH POWDER."—The recent fatal explosion of so-called "flash" powder at the laboratory of a Philadelphia chemist is a startling reminder of the unknown perils encountered daily by the fireman. The detonation was caused by the action of water upon the powder which was being poured into it from a seven-pint jar, with the idea of rendering it harmless and getting it out of the way, and was so terrific that three men were killed at once and five others injured. How it came that the unfortunate chemists were ignorant of the peculiar qualities of the powder will never be known. This case certainly calls for legislation absolutely forbidding the storage or manufacture in our cities of a substance which can be set off with the destructive force of dynamite by a simple stream of water, perhaps from a hoseman's pipe.—*Ex.*

METALS IN THE SUN.—Platinum has never as yet exhibited its presence in the sun's atmosphere, but recent investigation upon the solar spectrum would seem to establish the fact that it exists in the sun as well as upon the earth, lines corresponding to that element having been observed in the spectrum. The same investigation confirmed the belief in the presence of such metals as bismuth, cadmium and silver, which have heretofore been considered doubtful.

FOSSIL ICE.—Large deposits of ice, believed by some to be relics of the glacial period in this country, have been discovered in Idaho. It is proposed to form companies to mine this ice for sale in Western cities, where ice is always dear and scarce.

COCOANUT BUTTER.—German chemists have discovered in the cocoanut a fatty substitute for butter, and it is being produced in large quantities at Manheim. One factory turns out 6000 pounds per day, worth 15 cents per pound.

GOOD HEALTH.

The Temperature of Our Food and Drinks.

Of all nations, the American is the most in the habit of taking his food and drink at a temperature as remote as possible from that of the body. Ice-water drinking is a national habit, and ice cream a national dish, predilection for which runs through all classes of society, and becomes a binding force in social, and we might add, scientific and religious gatherings. Americans should, therefore, take an interest in the experimental researches on the temperature of our food and drink made by certain foreign savants whose names are, as is usual, hyperplastic with consonants just in proportion to the rigidity of their science and the seriousness of their inquiries.

The temperature of our food and drinks was treated of by Von Spath and Kostjurin a year ago, and more recently by Uffelmann of Rodstock.

Prof. Uffelmann reviews the work of his predecessors, and draws his conclusions partly from this and partly from his own experiments. They bear first upon the temperature of ingesta in health, and the rules laid down are:

1. That, in general, a temperature of food and drink which approaches that of the blood is most healthful. For nurslings such temperature is essential.

2. For quenching the thirst, the best temperature is from 50° F. to 68° F. The favorite American temperature is, as is well known, 32° F., and an issue is raised at once between Prof. Uffelmann and the American nation.

3. The ingestion of very hot or very cold food or drink in health has a damaging effect, which is increased just in proportion to the rapidity with which the hot or cold substance is taken. Hence the gulping down of ice water or hot coffee, etc., means eventually, according to the light we are quoting, a mere ventral damnation. If a person takes a drink for the purpose of warming himself, as in cold weather, he can accomplish this by having the drink at a temperature of 116° to 120° F.

4. The use of very hot and cold substances, following or alternating, is injurious to the teeth. But the taking of cold water lessens the injurious action of extremely hot substances upon the stomach.

5. Ingestion of cold food and drinks lessens the bodily temperature, whether it be normal or febrile.

6. Cold fluids lessen the hyperirritability of the stomach.

Cold ingesta raise the tone of the stomach, increase peristalsis, and promote movement of the bowels. Cold food and drinks increase the tendency to cough, according to Uffelmann, by causing reflexly a congestion of the bronchial vessels. Hence, persons with bronchial disease ought not to indulge in cold drinks. It is, however, a common custom to give persons who suffer from pulmonary hemorrhages ice to swallow; and, according to the view stated, this would be an injurious practice.

Hot food and drinks stimulate the stomach more than cold. But after repeated use they lessen the tonus of the digestive tract, and cause congestion and dyspepsia. This condition has been observed after the so-called hot-water cure. Hot drinks tend to lessen bronchial irritation, and this is one cause, possibly, of the success in some cases of the hot-water treatment of consumption.—*Medical Record.*

REMEDY FOR LOW SPIRITS.—Take an ounce of the seeds of resolution, mixed well with the oil of good conscience, infuse into it a large spoonful of the salts of patience; distill very carefully a composing plant called "other people's woes," which you will find in every part of the garden of life, growing under the broad leaves of disguise; add a small quantity and it will greatly assist the salts of patience in their operation; gather a handful of the blossom of hope, then sweeten them properly with the balm of prudence; and if you can get any of the seeds of true friendship, you will then have the most valuable medicine that can be administered. But you must be careful to get some of the seeds of *true friendship*, as there is a seed very much like it called "self-interest," which will spoil the whole composition. Make the ingredients into pills and take one night and morning.—*Cor. Sac. Sunday Union.*

CIGARS INFESTED WITH TUBERCULOSIS.—A celebrated European specialist for diseases of the throat, nose and ear, asserts that tuberculosis is making alarming progress among cigar-smokers. He does not attribute this to the use of tobacco, but to the manner in which cigars are manufactured. Rolling the tobacco-leaf is a craft that requires neither strength nor intelligence, consequently in this branch of the operation it is usual to find male and female operators who are weak and diseased, and who, in consequence of their infirmities, are economical employes. Most of these suffer from scrofula or tuberculosis. They cough, and often give the finishing touches to a cigar with their lips.—*Epoch.*

BETTER THAN DRUGS.—The victim of the habit of "taking something" for every little derangement or ailment often becomes a confirmed invalid. This paragraph is written with the hope that those not yet in bondage to this habit may be prevented from forming it. Exercise, open air, sleep, diet, rest, food, not in excess or deficiency—let the ailing medicate themselves with these, and there will be no drugs in their bodies to poison them. A good sister approached one of our ministers and asked information as to a certain remedy that costs a dollar. Said he: "Now don't try that drug, but spend the dollar in oranges, and eat one or two for *the first dish at breakfast;* they will produce the effect you desire, and they won't poison you." She followed the advice, and was gratified with the results.

CANCER AND AGE IN ANIMALS.—An instructive monograph on tumors in the lower animals, by Dr. Plicque, appeared in the *Revue de Chirurgie.* Among the more interesting definite facts included in his paper are the subjects of melanosis and the relation of cancer to age. Melanosis, so malignant in man, is far nearer the innocent type of tumor in animals, especially in the horse. A melanotic nodule on a spot subject to irritation by harness sometimes disappears when the harness is adjusted so as to rub the new growth no longer. The phenomenon has even been observed after the growth has begun to ulcerate. Other tumors, especially sarcoma and carcinoma, are often more intensely malignant in animals, especially the horse, than in man. Animals protected by the resources of civilization, so as to live to an old age, rarely if ever met with in nature, are especially subject to cancer. Indeed, Dr. Plicque finds distinct evidence that age is far more predisposing to cancer in beasts than in man. Bouley, a French veterinary authority of experience, believes on the ground of long observation, that dogs are doomed to cancer if they live to old age and are not killed by some acute pulmonary or gastro-intestinal affection. The cat, often cherished and kept alive when old and miserable, is also very subject to cancer in age. Statistics show that cancer is far more frequent in the carnivora than in vegetable eaters. This statement, as Dr. Plicque is careful to explain, is liable to mislead the pathologist; indeed, it is a capital example of a statistical doctrine eminently calculated to deceive the thoughtless. For if we only note what animals are mentioned in this paragraph the truth will become apparent. Old cats and dogs, carnivorous animals, are kept alive through a somewhat misguided philanthropy, or rather zoophily. But an old horse is seldom favored in this doubtful way, and cattle are killed, or ought to be killed, when they are young and tender. The herbivora have little chance of living long enough to have cancer.—*Lancet.*

USEFUL INFORMATION.

Chinese Floating Gardens.

Dr. Macgowan, a gentleman well known to scientific circles in this city, and long a resident of China, has given a lengthy description in the *China Review* of the manner in which the well-known floating gardens of that country are formed. The article has been condensed as follows: "In the month of April, a bamboo raft 10 to 12 feet long, and about half as broad, is prepared. The poles are lashed together with interstices of an inch between each. Over this a layer of straw an inch thick is spread, and then a coating two inches thick of adhesive mud taken from the bottom of a canal or pond, which receives the seed. The raft is moored to the bank in still water, and requires no further attention. The straw soon gives way and the soil also, the roots drawing support from the water alone. In about 20 days the raft becomes covered with the creeper (*Ipomœa reptans*), and its stems and roots are gathered for cooking. In autumn its small, white petals and yellow stamens, nestling among the round leaves, present a very pretty appearance. In some places marshy land is profitably cultivated in this manner. Besides these floating vegetable gardens there are also floating rice-fields. Upon rafts constructed as above weeds and adherent mud were placed as a flooring, and when the rice shoots were ready for transplanting they were placed in the floating soil, which being adhesive and held in place by weed-roots, the plants were maintained in position throughout the season. The rice thus planted ripened in from 60 to 70, in place of 100 days. The rafts are cabled to the shore, floating on lakes, pools or sluggish streams. These floating fields serve to avert famines, whether by drouth or flood. When other fields were submerged and their crops rotten, these floated and flourished; and when a drouth prevailed they subsided with the falling water, and while the soil around was arid, advanced to maturity. Agricultural treatises contain plates representing rows of extensive rice-fields moored to sturdy trees on the banks of rivers or lakes which existed formerly in the lacustrine regions of the Lower Yangtsze and Yellow rivers."

A MACHINE FOR WRAPPING ORANGES.—The Remington Arms Company is manufacturing for Humphrey Williams of Yorkville, Oneida county, N. Y., a large number of machines for packing or wrapping oranges in papers for shipping. The machines are simple and comparatively inexpensive, but one will do the work of three persons at least. They will wrap nicely in papers 2500 oranges per hour. The machine is about three feet long by three feet high and 18 inches wide, not including the cylinder for feeding or the endless chain carrier, which is about seven feet long, and operates like a straw-carrier in a threshing-machine, and carries the fruit after the wrapping operation to bins or boxes. The machine is operated by a crank. The fruit passes from the cylinder down a slide, one at a time, into a wire cup, which opens and drops the orange on a square paper cut by the machine from a roller, then passes through an aperture which wraps the paper and trims it, then the fruit passes on to the carrier. The operation is both simple and rapid.

CAST IRON PIPE FOR NATURAL GAS.—An opinion has become quite prevalent that cast-iron pipe is not safe for collecting natural gas. Those who have imbibed that idea may be interested in the following which a Cincinnati manufacturer of cast-iron pipe writes to an exchange: "The Central Ohio Natural Gas and Fuel Company of Columbus, O., has just contracted with Northern pipe foundries for 25 miles of cast-iron pipe, to be used in the distribution of natural gas. This, in connection with the ever-increasing demand for pipe, even in the Pittsburg district, for the same purpose, is of sufficient interest to your readers, we think, to have you devote some space in your next number to calling attention to the use of cast-iron pipe as a conduit of natural gas. This year the Equitable Natural Gas Company have laid their entire system from their field reducing station to Pittsburg of 24-inch and 30-inch cast-iron pipe, and now have their plants in successful operation. The People's Natural Gas Company, the Monongahela Natural Gas Company, the Philadelphia Company, all of Pittsburg, are laying enormous quantities of natural gas cast-iron piping. The Indianapolis (Ind.) Natural Gas Company, as well as the natural-gas companies of Fort Wayne and Logansport, Ind., have much of their system laid with cast-iron pipe, and their extensions are being made with the same kind of pipe."

HOW TO STOP A RUNAWAY HORSE.—A policeman, who has distinguished himself in stopping runaway horses, gives in the Medical Classics the following points as to how to accomplish this difficult feat with the greatest success. When you see a runaway coming, do not try to check him by a rush from the opposite direction or the side, for you will be immediately knocked flat by the collision; but instead, prepare yourself for a short run with the horse. Measure with your eye the distance, start for the run while he is yet some distance off, perhaps ten feet in the case of fair to medium runaways. You may depend upon his keeping a straight line, for a really frightened horse is half blind, and would not veer for a steam engine. He will go straight ahead until he smashes into something. So do not get close to the line on which he is rushing, and as he passes you, grab the reins near the saddle. Gather the reins firmly, and then, leaning backward as you run, give them a powerful yank. You may be able to brace yourself somewhat as you give this jerk by half sliding on your feet. The strong jerk on the bit tells the horse that he again has a master, and prepares him for the final struggle. A step or two forward after the first yank, do it again. This is the finishing stroke. It never fails when given by a determined man. Keep a firm pull on the reins till you grasp the horse by the nostrils, and hold him so till he is pacified.

A NEW USE FOR THE FIRE-ESCAPE LADDER.—In the next war we are likely to see the aerial turntable ladder truck employed in a novel manner in siege or even field operations. The Germans have discovered that for purposes of observation the extension ladder fire-escape is superior to a balloon. The latter is, of course, peculiarly liable to destruction from an enemy's shot, while from the top of an aerial ladder a man can look over into a fortification or earthwork with the minimum of danger. The apparatus is, of course, also more handy in every way than a balloon. Apparatus of the kind have already been added to the equipment of the German army, and are being experimented with. Here is a new field opened to our enterprising inventors and makers of such machines.

LOCK-WIRE ROPE.—A style of wire rope, quite new in this country, although it has been used for a year or two in England and on the continent, called "lock-wire rope," bids fair to take the place of the greater portion of other make of wire rope now in use, particularly where great strain is required and as small a rope as possible is desired. The outer layers of wires of which the rope is made are irregular in section, and not round, as in ordinary wire rope. The inside or heart of the rope is formed of wires instead of hemp, and these wires are round.

DIRT REMAINS.—Somebody says: If the floor of a room is swept ever so clean with a hair broom, yet if it is then washed, the water in the pail reveals that much dirt was left; if wheat is ever so well cleaned with the dry process and then washed in a good wheat-washing machine, the water reveals the dirt still remaining.

WHY DO THEY?—A correspondent of an exchange writes: Apropos of left-handedness, I should like to see a satisfactory explanation of the fact that women always (with exceedingly rare exceptions) button from right to left, and men from left to right. Personally I have remarked only four cases of exception to the rule.

ELECTRICITY.

PROGRESS IN ELECTRIC LIGHTING.—The recent advance in electric lighting is most notable. The increase in the number of lights has been steady and rapid, and, although no radical improvements nor fundamental discoveries have been made, yet the efficiency of all of the lighting systems has been largely increased and the expense reduced. In arc lighting, there have been only changes in detail of the important systems, but the number of new stations being equipped, and that have started in the last year, greatly exceeds the showing made in 1887. Incandescent lighting has progressed still more rapidly. The Edison Company has erected central stations of large capacity—up to a maximum of 50,000 lamps—in New York, Philadelphia, Chicago and other cities, besides adding to the already long list of smaller stations. They have increased the efficiency of their incandescent lamps, and have perfected their dynamos. The returns of stations using this system have been for the year most satisfactory, and it is stated in some of the technical papers that no less than $10,000,000 has been subscribed abroad for the extension of the system. The number of electric motors that have been supplied from central stations has also largely increased. The Westinghouse Company has continued to distribute electricity by the alternating system, and has rivaled the increase of the older Edison Company.

GENERATION OF ELECTRICITY DIRECT FROM COAL.—Prof. John Perry, F. R. S., in a recent address in England said: "Now, I pointed out in 1881 that if coal or gas were burnt in a voltaic cell, as zinc is burnt, and an electromotor were used, we could utilize as mechanical energy not merely one-tenth but nearly nine-tenths of the energy of coal. I pointed out then that coal-gas could be burnt in this way, but there were two difficulties: First, the apparatus required was too large per horse-power developed. Second, the apparatus required was too expensive. The first of these difficulties has already been got over by a correspondent, who is in some sense my partner. We see our way to developing one useful horse-power per cubic foot of volume of apparatus. Unfortunately, the difficulty of expense still remains. But I am firmly convinced, and I have good reason for my belief, that all the difficulties will be got rid of, and that coal will actually be burnt in this way. Even to those of you who may not be troubled about the general question of economy, the mere possibility of an armor-clad being able to carry enough coal for a voyage at full speed around the world, must appear to be an important result."

SPEED OF ELECTRICITY.—There is, as Prof. Thompson remarks, no assignable "velocity of electricity," as this must vary with the current and the conductor. Wheatstone, in 1833, seemed to show a transportation velocity of 183,000 miles a second through copper wire; but in late experiments, signals were sent over ordinary telegraph wires on poles, and had a rate of only 14,000 to 16,000 miles. With wires near the earth, the velocity was 12,000 miles, but reached 24,000 on very high wires.

ELECTRICITY IN A COAL MINE.—The Erie colliery at Mayville, Penn., is lighted by electricity, and uses an electric motor for hauling purposes. It is claimed that this use of electricity effects a saving of $25 per day on the cost of power, and that with the further advantages derived from the electric light over the ordinary method of lighting, has enabled the company to increase its output from 1000 to 1500 tons per day.

PRESERVING MILK BY ELECTRICITY.—M. Maisonhaute, says the *Bulletin International de l'Electricite*, having noticed that the passage of a current of electricity through milk retarded the formation of cream, made a series of experiments to see whether milk could be kept fresh in this manner. The result of these experiments is a patent for the preservation of milk by means of either static or current electricity.

TELEPHONES IN AUSTRIA.—Telephonic communication has been established in Austria between Vienna and Prague, a distance of 220 miles. It is said that the curious fact has been noticed that those who listen at Prague hear more clearly than those who listen at Vienna. After much discussion as to the cause, some one has suggested that they speak plainer at Vienna.

TELEGRAPH RATES IN RUSSIA.—In Russia, the telegraphic system is under Government control. One of its rules requires that no female telegraphist shall marry any one not employed as a telegraphic operator, and it also requires that in case of sickness the wife shall be the substitute of the man, and perform double service.

AN ELECTRICAL DOG-CART.—An ordinary-looking four-wheeled dog-cart, without shafts and driven by electricity, recently appeared in Camden, New Jersey, doing ten miles an hour with ease. It has been built for the Sultan of Morocco.

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Passing Events.

The heavy rainstorm has continued for many days, and as we write (Thursday), gives promise of still continuing. More or less damage has resulted from the incessant rainfall, mainly in washouts along the railroad lines. Some of the lands along the main rivers have been flooded, and there is anxiety where the levels are not of first-class construction. There will be no lack of water the coming mining season.

A very important decision to owners of mines within the Central Pacific Railroad grant has been rendered by the U. S. Circuit Court, in which the miners lose, on the ground that the land had been listed as agricultural and was not known as mineral when the grant by Congress was made. The subject is referred to elsewhere in the PRESS.

The message of the President and the election of a "gold-bug" as Speaker of the House, seems to have had a bad effect on the price of silver, which has stopped the advance it had previously been showing. However, the subject of silver will be very thoroughly discussed during the present session of Congress, and the interests of silver miners will not be neglected.

AN officer of the Canadian Pacific steamer Danube told a reporter of the *Astorian* that his entire crew were made seasick on a recent trip crossing the Columbia river bar.

Secretary Windom's Report on Silver.

In another column we give the text of Secretary Windom's views on the silver problem, a careful reading of which will convince the most obtuse that while he advances arguments from his standpoint that are of a convincing character of their correctness, not only in theory but also when put in practice, yet he would give the Treasury such monetary power as to virtually dictate the finances of the country. In this we make more special reference to his being granted "discretionary power to suspend temporarily the receipt of silver bullion for the payment in notes when necessary to protect the Government against combinations formed for the purpose of giving an arbitrary and fictitious price to silver." If this be granted, he is to be the sole judge, which clothes him with a financial dictatorship that no one man should possess.

The Secretary has unquestionably given to the subject that close study which its great importance demands, and has evidently brought to his aid the views and opinions of the ripest and most experienced financiers in the country. In doing this he must have consulted with those holding all grades of opinion on the silver problem, and from their expressed opinions deduced his own conclusions. If a bill is drawn up in accordance with the Secretary's suggestion, it will be hedged in such a manner as to insure both the Government and the holders of Treasury notes issued against deposited bullion against loss; it will give to the notes a monetary value which places them at par without fluctuating, for it would pledge the Government for their redemption on demand at their full expressed face value. In this connection we refer the reader to the Secretary's report, which is not only concise but made so plain as not to require elaborating.

The more closely the Secretary's position is studied, the more convinced must be the student that if his views, with probably two or three changes, and two or more other provisions, be drafted into a bill and become a law, the result will be, sooner than thought, the free coinage of silver, not only in this country but also by the nations composing the Latin Union, which will have a strong bearing in causing other countries to remonetize silver and adopt free coinage. One of the provisions we refer to is the retirement of both the national bank notes and legal tenders, by the payment of Treasury notes issued against silver purchased by the Treasury. These purchases would absorb the silver bullion product of this country for several years to come, and bring the metal up to the parity of gold. Holders of legal tenders would not hesitate a moment to relinquish them and accept in lieu therefor notes that are based on the metal currency of the country, and for whose redemption on demand the Government stands pledged.

Probably one of the most essential ideas conveyed in the Secretary's suggestions, and which the casual reader would overlook, is that if his views, as expressed in his report, are enacted into a law, England and other nations desiring silver bullion from this country must bid well up for it in the open market or else buy Treasury notes and draw out the bullion from the United States depository. This would virtually give to this country a whip handle in the world's silver market never before enjoyed by giving us the full control of values. The Act would also prevent this country from being flooded with foreign silver coin, which is a desirable end to be kept in sight.

The Secretary's report is so worded as to convey the idea that he, like many others, labors under the impression that the production of silver can be largely increased to the detriment of the country that remonetizes it. In the light of the past we think that it is about time that such absurd notions are dispelled. The world's product has steadily decreased until last year it reached only about $135,000,000, being below the world's requirements.

AMERICAN TIN.—It is stated that an English syndicate with $15,000,000 capital is about to develop the American tin mines. The first operations will be in the Black Hills, Dakota.

THOMAS CRACKLIN was killed in the North Star mine, Grass Valley, on the 9th inst. He was struck by a car on the 900-foot level and was knocked to the 1100-foot level.

The World's Increasing Gold Production.

Heavy deposits of snow on the higher mountain ranges insure a liberal supply of water in this State for both surface and deep mining. For several winters past the water supply has been steadily decreasing, in many districts either not affording enough for surface mining and water-power for mills, or else giving a supply not lasting longer than two or three months. Private advices received from several of these localities give the gratifying information that there is quite a sufficient supply to admit of working the idle mines. As they are producers of gold, it now looks as if for the fiscal year ending with June, 1890, California's output of gold will show an increase of fully 20 per cent over that for the like time in 1888–89. California is not alone on this coast in the promise of an increased gold yield, for from Nevada advices are coming to hand that make it certain that that State's gold output will show a very large gain, particularly from the Comstock mines and the White Pine district. It looks as if the mines on the Comstock will before the close of 1890 show all of from 75 to 90 per cent gold against very nearly that much of silver now.

With an increased production of gold in this State and also in Nevada, it confirms the view of many that the world's output of gold in next year will equal if not exceed that of silver. This is borne out by returns for the first six months of this year from the several gold-producing countries. Bearing on this, a late English exchange says that from January 1, 1889, to July 1st, the gold product of the Transvaal district, South Africa, was £750,000, as compared with £400,000 during the corresponding period of last year and £900,000 during the whole of 1888. During the 17 years from 1871 to 1887 the South African gold production averaged only £50,000; this year the Transvaal and remaining localities are estimated to turn out £1,750,000. In Australia, Queensland is gradually taking the lead. From 1851 to 1886 the yearly average was £542,000, the 1887 production reached £1,590,000, and during the first half of the present year it amounted to £1,400,000, the increase being chiefly due to the extraordinary yield of the Mount Morgan mine, which for some months past has been distributing a monthly dividend of £100,000 on a stock capital of £1,000,000. About 6000 tons of gold quartz pass through the stamps of the mine every month, the average extracted from a ton being 5¼ ounces. Several other Queensland mines are also doing well. The total yield of the colony is estimated at £3,000,000 for the current year against an average of £542,000 from 1851 to 1886, both included.

Favorable reports have recently been received from Peru and Bolivia, where, between the River Madre de Dios and the Peruvian frontier, rich gold-fields have been discovered. A railroad is to be built from the banks of the Madre de Dios to the Amazon river in Brazil. Gold production in British India has to deal with comparatively modest figures. During the fiscal year 1888–89 the entire yield was £400,000.

Shasta County Ore Milling.

Josiah Phillips, who had charge of the Dodge pulverizing-mills at the Hart & Fleming and Little Nellie mines, Shasta Co., is in the city again. He says the Dodge pulverizers and Triumph concentrators have been doing excellent work up there. At the Hart & Fleming, they had a five-stamp mill, but could make no money with it, and tried a Dodge pulverizer and Triumph concentrator. With these, the mine paid enough in the last six months for Hart & Fleming to buy for $40,000 the Bugbee or Little Nellie mine, where they have put up another No. 2 Dodge mill and two Triumph concentrators. The pulverizer has been crushing 12 tons of very hard rock every day—rock that many people did not think the machine could handle at all. The machinery used saves the sulphurets and fine slimes, which makes all the difference possible in the results accomplished.

The Walker Bros.' mine, near Redding, Mr. Phillips says, started up a few weeks ago. They have ten stamps of 1150 pounds each, and crush 30 tons of ore per day, employing 45 men in the mine and mill.

Prospectors and Geologists.

Prospecting for gold is done either in a region hitherto unproved, or in sections which contain auriferous areas for extensions are lost or abandoned leads. There are still tracts in this State which have never been carefully prospected, but where gold may possibly be found. The Los Burros district, in Monterey county, is in a range where no one supposed good mines could ever be discovered; yet some good mines are being worked there, and it is on the Coast Range. The relations between the geologist and the practical miner have never been very cordial in this country. There is a tendency on the part of the geologist to regard the miner as an empiric, while the miner is apt to regard the geologist either as possessing mysterious knowledge or one ignorant altogether of practical mining.

Geological science does not teach that gold is arbitrarily confined to any particular formations, or to rocks of any special group; but the experience of practical observations and the results of scientific investigation show that in various parts of the world the deposit of gold in matrix rocks has been most actively developed during certain geological periods, some very ancient, others comparatively recent, and that alluvial gold can only be looked for successfully in formations resulting from the denudation of such matrix rocks. Every old prospector can tell his tale to illustrate how uncertain and apparently erratic is the mode of occurrence of gold in both alluvial and quartz. The creek-bed prospected from side to side without result, while the rich lead lay concealed under adjacent hill-slopes; the holes bottomed without a color, while a few feet away ounces of gold to the pan rewarded subsequent workers; the promising quartz-gravel in well-defined lead worthless, while an adjacent ledge-wash or angular detritus near by paid well; the well-defined lead barren, while an insignificant vein near by, paid largely. All and many more instances are within the experience of most men who have worked in gold-fields.

This does not imply there is no law. It simply means that we have not yet mastered the law so far as to be able to indicate certainly where gold will or will not be found within an area having generally encouraging conditions. Every fragment of gold is in the place where found in consequence of the operation of certain fixed laws. The chemical laws we may know, but have not learned their application as regards the deposits of gold in matrix rocks. The mechanical laws are simple enough in themselves, but how their operation was influenced by past geological or physical conditions we can only conjecture.

Hence it can be easily understood that, though the geologist may be able on scientific reasoning to indicate generally the areas where gold may or may not be found, he may not be able, unless he has had practical experience, to direct the actual search as well as the practical prospector, who has been taught by numerous failures or successes to look for it in any conceivable position, regardless of any apparent law that may have been formulated from a limited experience.

THE North Beach & Mission R. R. Co. of this city will probably decide at its next meeting whether its cars, which are now drawn by horses, shall be moved by cable or electricity. Electricity is favored by the company and will be adopted as the motive power if it is found that it can be used successfully.

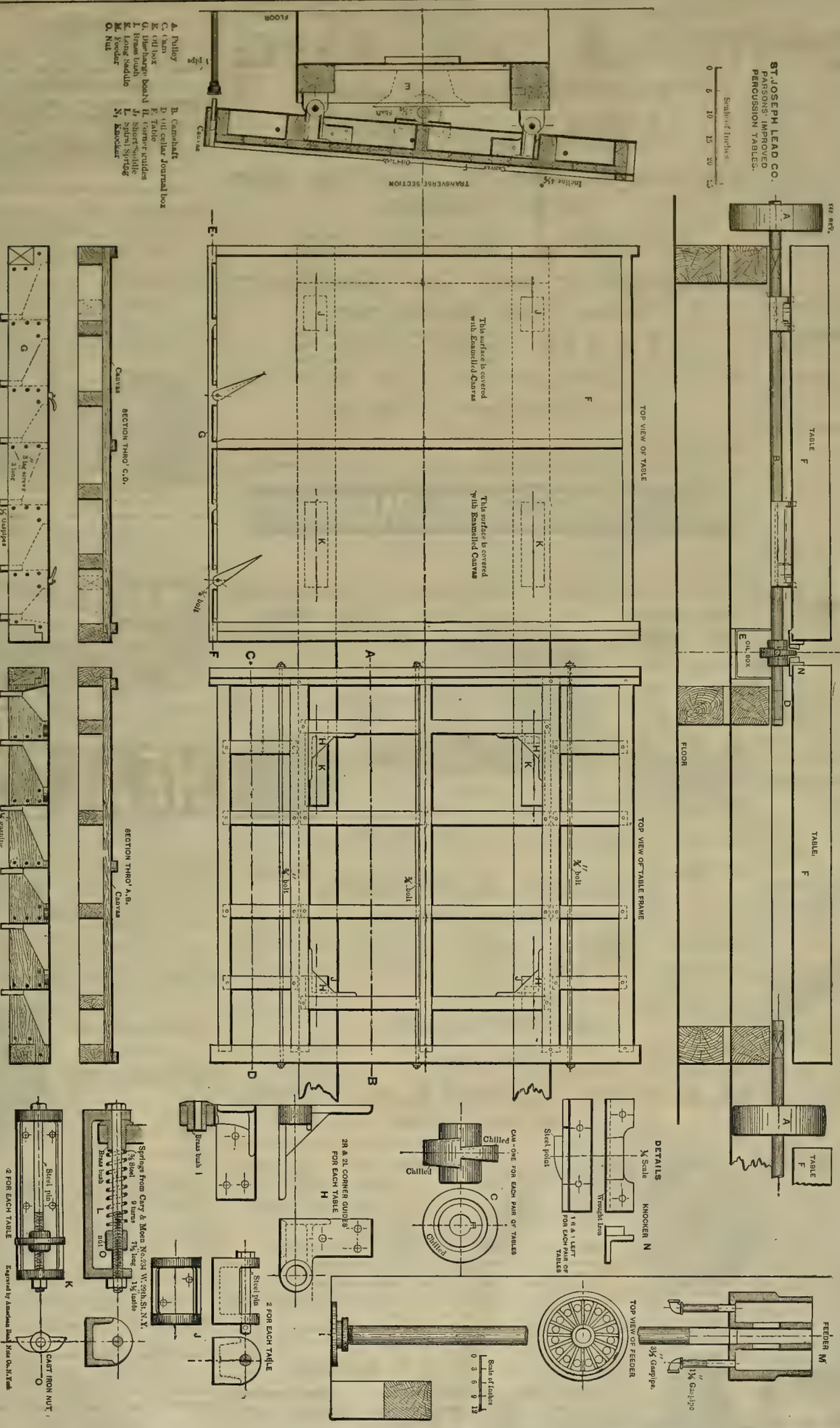
EDMUND BELL, a well-known mining man, was drowned near Sunny Hill, Shasta county, on Sunday. He was engaged in replacing a foot-bridge across the north fork of Cottonwood Creek and fell into the water.

RUDOLPH HERING, an Eastern sanitary engineer, is to be paid $1000 and expenses by Oakland for a report as to the condition and requirements of the municipal sewer system.

SINCE the late storm, placer mining near Hornitos, Mariposa county, is prosecuted with much success. The Merced *Express* says the miners expect to get $100,000.

THE new coast defense vessel now well under way at the docks of the Union Iron Works has been named the Monterey.

THE San Francisco Supervisors will soon appoint an inspector of elevators.



THE PARSONS-RITTINGER TABLES IN USE AT THE ST. JOSEPH ORE-DRESSING WORKS, BONNE TERRE, MISSOURI.

Parsons-Rittinger Table.

The Rittinger side-bump table, as modified by Mr. Parsons, is used at the ore-dressing works of the St. Joseph Lead Co. at Bonne Terre, Mo., and was described before the American Institute of Mining Engineers by H. S. Munroe, of the School of Mines, N. Y. The cut on this page shows the table in detail. The tables are built in pairs, and each table is made double as usual. They are small, each half the double table being about 3 feet by 7½ feet. Instead of being hung from rods, the table is supported on four cast-iron feet or "guides," which slide on horizontal steel rods. The latter rest in cast-iron "saddles," bolted to the heavy sill-timbers which run under the whole row of tables. Light spiral steel springs around two of these rods give motion to the table. The tables bump against each other, the blow being taken by a joist of hard wood lying loose between them (not shown in the drawing). The tables are forced apart, against the tension of the springs, by a spiral wedge-shaped cam; 150 bumps, ⅝ inch long, are given per minute.

The surface of the table is covered with the black enameled duck, sometimes used for desks. This covering is cheap and easily renewed, and furnishes a surface well adapted for the exceedingly fine material treated. The tables are inclined 4½°. There are 16 pairs of double tables in the mill, or 64 tables in all. Of these, 32 are head tables and 32 are used for treating middlings. They are not worked to their full capacity, the head tables treating but 1¼ tons each, or 2½ tons to the double tables per 24 hours. The material treated is exceedingly fine, 70 per cent being less than one-twentieth mm.

The following are typical assays of the stuff treated and the resulting tailings. The samples, as before, were subdivided by sifting: Size, ½ mm. to ¼ mm.; percentage of sand of given size, 9 0; percentage of lead in stuff treated, 2.50; percentage of lead in tailings, .82; size, 1-20 mm. to ⅛ mm.; percentage of sand of given size, 19 4; percentage of lead in stuff treated, 2.65; percentage of lead in tailings, .40; size, below 1-20 mm.; percentage of sand of given size, 71.6; percentage of lead in stuff treated, 15.52; percentage of lead in tailings, 2.74; average percentage of sand of given size, 100.0; average percentage of lead in stuff treated, 11.75; average percentage of lead in tailings, 2.45

The yield of ore treated year before last was 5.65 per cent. The loss on the tailings is about 2.13 per cent, or 27.4 per cent of the total amount of lead in the ore. The losses in the Lake Superior copper-mills range from 28 5 per cent to 31 per cent, treating material much more easily saved than this galena. At Bonne Terre, an unusually large part of the mineral exists in the ore in an exceedingly fine state of division. This necessitates very fine crushing, and consequently involves the production of a large amount of very fine stuff, much of which contains galena too fine to be saved. The cost of dressing is 36.4 cents per ton, which compares favorably with the very best Lake Superior practice.

Natural Gas Pipe.—It is estimated that there are 27,350 miles of pipe mains being used for the transmission of natural gas at the present time. In Pittsburg alone there are 500 miles, which supply 40 iron-working factories, 37 glass houses, 83 foundries and shops, 450 enterprises of various kinds, and 4268 private houses. The amount of gas consumed is represented by an annual consumption of about 7,000,000 tons of coal.

Lake Nyassa, Africa, is a gigantic trough of granite and gneiss, 300 miles in length, nowhere over 50 miles in breadth, and 1600 feet above the level of the sea, the mountains rising all around it, and sometimes almost sheer above it to a further hight of 1000, 2000 and 3000 feet.

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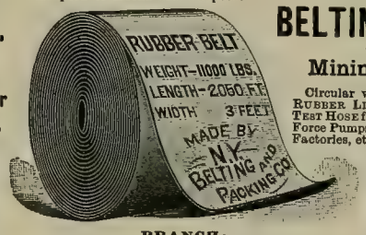
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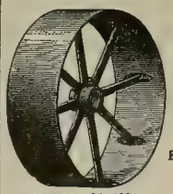
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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific States.

FOR WEEK ENDING DEC. 3, 1889.

416,603.—CONCENTRATOR BELT—H. G. Blasdel, Oakland, Cal.

416,216.—GAS-GOVERNOR—F. Ellis, S. F.

416,673.—CABLE GRIP—J. W. Gentry, Oakland, Cal.

416,674.—STAMP-CANCELING MACHINE—Wm. Groth, S. F.

416,603.—AIR BRAKE RELIEF VALVE—Wm. W. Hanscom, S. F.

416,689.—OIL-GAS APPARATUS—A. Henning, Oakland, Cal.

416,704.—ORE CONCENTRATOR—H. P. Holland, S. F.

416,618. FEEDER FOR HARVESTERS—Benj. Holt, Stockton, Cal.

416,622.—LADDER—T. J. Hubbell, Santa Clara, Cal.

416,626.—ORE CONCENTRATOR—J. B. Irvin, Sparta, Ogn.

416,189.—REGULATOR FOR ELECTRIC MOTORS—N. S. Keith, S. F.

416,464.—GRAIN-CLEANER—M. N. Laufenburg, Stockton, Cal.

416,472.—ADDRESS TAG—R. J. Loughery, S. F.

416,129.—AGRICULTURAL MACHINE—J. D. Morgan, Ventura, Cal.

416,302.—COFFIN-FASTENER—Scott & Nelson, S. F.

416,516.—AIR-BRAKE VALVE—T. P. Sweeney, Sacramento, Cal.

416,518.—SICKLE-GRINDER—H. Thibault, Stockton, Cal.

416,201.—STRINGING PIANOS—C. S. Weber, San Jose, Cal.

416,386.—NECKTIE-FASTENER—A. A. Wentworth, Merced, Cal.

17,241.—TRADE-MARK—J. P. Smith, S. F.

The following brief list by telegraph, for Dec. 11, will appear more complete on receipt of mail advices:

California—H. W. Bodeman, San Francisco, adjustable stove-grate; M. P. Boss, San Francisco, stamp battery; S. P. Burdick, Oakland, vehicle; H. A. Free, Vacaville, paper-fastener; George Harvey, Forrestville, draft-hook; Benjamin Holt, Stockton, grain-cleaner; W. P. Humphreys, San Francisco, three patents for dredging apparatus; Anthony McLean, San Francisco, carrying-pulley; J. H. McNutt, Alameda, water-heating attachment for gas-stoves; P. J. Moore, San Francisco, oil-can; Jacob Myers, Eureka, suspender buckle; Charles E. Naylor, San Francisco, means for operating device for show windows; E. L. Ransome, San Francisco, concrete mixing machine; W. T. Y. Schenck, San Francisco, hose reel; Charles Schultz, Merced, cable-grip and turn-tab e; Emil Schroeder, San Francisco, hair-clipping bench for fur dressers; J. H. Scott, San Francisco, c ffin-fastener; J. A. Howell, Wheatland, sickle bar for harvesters; H. E. Thomas, assignor of one-half to F. H. Hausman, San Francisco, surf-power machine.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

GRAIN SEPARATOR AND CLEANER.—M. N. Laufenburg, Stockton, assignor to the Stockton Combined Harvester and Agricultural Works. No. 416 464. Dated Dec. 3, 1889. This is an apparatus for more perfectly separating and cleaning grain. The invention is intended to separate from the grain as much as possible of the straw and lighter chaff so as to reduce the work of the supplemental cleaner.

OIL-GAS APPARATUS.—Abel Henning, Oakland, assignor of one-half to Alfred M. Belt of Alameda and Thos. Flint of San Juan. No. 416 609. Dated Dec. 3, 1889. This is an improved apparatus for the manufacture of gas from naphtha or other similar hydrocarbon product. By the arrangement adopted the inventor has an automatic control over the supply of gas-making material so that the apparatus will be self-operative and self-regulating.

ADDRESS TAG.—Robert J. Loughery, S. F. No. 416,472. Dated Dec. 3, 1889. The object of this invention is to provide a convenient and effective device for use in putting up and shipping bundles of merchandise with a permanent tag on which to mark the address of the goods for shipment or other purposes. It consists of a combination binding board and tag, having rope permanently attached thereto, said ropes being passed around the bale or bundle so as to inclose the whole, and the board with them.

FEEDING MECHANISM FOR COMBINED HARVESTER AND THRASHER.—Benjamin Holt, Stockton. No. 416,618. Dated Dec. 3, 1889. This is an improvement in traveling harvesters in which the grain which is cut by the sickle is transported by a carrying-belt called the "draper" and discharged upon what is known as the self-feeder, from which it is delivered to the cylinder of the thrashing machine, passing thence to the cleaning apparatus. The present invention consists of a device for assisting in the delivery of the straw from the draper to the self-feeder and preventing the lodgment and clogging of the straw in its progress from the header to the thrasher. In the usual construction of headers and thrashers the grain is delivered from the upper end of the draper so as to fall approximately upon the self-feeder which delivers it to the cylinder; but a great deal of the straw and chaff fall down from the end of the belt and soon become piled up and clogged in this space. Mr. Holt's invention is designed to overcome this difficulty by providing a constantly-moving shaking-table intermediate between the draper and self-feeder.

SICKLE-GRINDER.—Henry Thibault, Stockton. No. 416,518. Dated Dec. 3, 1889. This is a grinding implement specially adapted for sickle-grinding. The blade to be ground is supported by flanges of a top-plate and presses down on the stone, which, by means of a treadle and intervening gears, is rotated. The pressure down upon the stone causes a spring to condense and bear upwardly so as to hold the stone constantly and with required pressure to its work. In grinding sickles it is of great importance that the pressure of the stone be nicely regulated. In this case this is effected permanently by a collar by which the inventor accurately regulates the tension of the spring.

ORE CONCENTRATOR BELT.—Henry C. Blasdell, Oakland. No. 416,663. Dated Dec. 3, 1889. This invention relates to that class of belts used in endless-belt concentrators, and it consists in the novel arrangement of the side flanges of the belt. The object is to provide a concentrator belt of this class with side flanges which are arranged in such a manner that in passing over the drums or rollers of the machine they will conform in the best manner to their change of direction and will also better confine the charge upon the surface of the belt.

Secretary Windom's Silver Policy.

Late mail advices from Washington give the following from Secretary Windom's report to Congress, and to which President Harrison referred in his annual message :

The Secretary enters into an able and learned dissertation on the silver question, and devotes many pages of his report to the same. Elaborate statistics are given and the subject is thoroughly discussed in all its details, closing with the following recommendation :

The Measure Recommended.

Issue Treasury notes against deposits of silver bullion at the market price of silver when deposited, payable on demand in such quantities of silver bullion as will equal in value at date of presentation, the number of dollars expressed on the face of the notes at the market price of silver, or in gold, at the option of the Government; or in silver dollars, at the option of the holder. Repeal the compulsory feature of the present Coinage Act.

The Secretary desires to call special attention to this proposition, believing that in the application of its principles will be found the safest, surest and most satisfactory solution of the silver question as it is now presented for the action of this country.

In explaining the proposed measure at this time it is intended to deal only with its general features, but, if desired, a bill embracing the details believed to be necessary to its satisfactory operation will be prepared and submitted for the consideration of Congress.

The proposition is briefly this: To open the mints of the United States to the free deposit of silver, the market value of the same (not to exceed $1 for 412.5 grains of standard silver) at the time of deposit, to be paid in Treasury notes; said notes to be redeemable in the quantity of silver which could be purchased by the number of dollars expressed on the face of the notes at the time presented for payment, or in gold, at the option of the Government, and to be receivable for customs, taxes and all public dues; and when so received they may be reissued; and such notes, when held by any national banking association, shall be counted as part of its lawful reserve.

The Secretary of the Treasury should have discretionary power to suspend, temporarily, the receipt of silver bullion for payment in notes, when necessary to protect the Government against combinations formed for the purpose of giving an arbitrary and fictitious price to silver.

If the price of silver should advance between the date of the issue of a note and its payment, the holder of the note would receive a less quantity of silver than he deposited, but the exact quantity which could be bought in the market with the number of gold dollars called for by his note, at the date of payment. If the price should decline, he would receive more silver than he deposited, but the quantity which could be purchased with the number of gold dollars called for by his note at the time presented for payment.

Three Good Results.

The advantages of retaining the option to redeem in gold are three-fold :

First—It would give additional credit to the notes.

Second—It would prevent the withdrawal and redeposit of silver for speculative purposes.

Third—It would afford a convenient method of making change when the weight of silver bars does not correspond with the amount of the notes.

So far as the issue of the notes is concerned, the plan is very simple. If a depositor brings a hundred ounces of silver to the mint, and the market price of silver at that date, as determined by the Secretary of the Treasury, is 95 cents an ounce, he would receive in payment Treasury notes calling for $95.

Various methods of redeeming the proposed notes have been considered, but the plan recommended seems preferable.

They might be redeemed wholly in silver bullion of the same weight as that deposited; that is to say, if an owner of silver had deposited a hundred ounces, he might receive back a hundred ounces.

The objection to this plan of redemption is that it would subject the notes to all the fluctuations which might occur in the price of silver, and, from lack of steadiness and certainty of value, they might not circulate freely as money.

Another plan which has been suggested is to redeem them in lawful money of the United States, dollar for dollar. This is practically a purchase of the bullion at its market price, the Government becoming the owner of it on the issue of the notes. This method has some features which commend it, but on the whole it does not seem logical or desirable that the notes should be redeemed in a currency which is certainly no better, if as good, as themselves. Moreover, it does not seem expedient to pile up in the vaults of the Government a large quantity of silver bullion, which cannot be made available for the redemption of the very notes which are based upon it.

True, the Government might coin the bullion into standard silver dollars and use the resulting coin for the redemption of the notes, which would be quite satisfactory when the silver dollar becomes equal in value to the gold dollar, but at present it would not appear to be either just or desirable to issue a note on a deposit of a hundred cents' worth of silver, and redeem it with a dollar containing only 72 cents' worth of silver.

Advantages of the Proposed Measure.

Among the obvious advantages of the measure proposed, the following may be briefly stated:

First—It would establish and maintain through the operations of trade a convenient and economical use of all the money-metal in the country.

Second—It would give us a paper currency not subject to undue or arbitrary inflation or contraction, nor to fluctuating values, but based, dollar for dollar, on bullion at its market price, and having behind it the pledge of the Government to maintain its value at par, it would be as good as gold, and would remain in circulation, as there could be no motive for demanding redemption for the purposes of ordinary business transactions.

Third—By the utilization of silver in this way a market would be provided for the surplus product. This would tend to the rapid enhancement of its value, until a point be reached where we can with safety open our mints to the free coinage of silver.

Fourth—The volume of absolutely sound and perfectly convenient currency thus introduced into the channels of trade would also relieve gold of a part of the work which it would otherwise be required to perform. Both of the causes last mentioned, it is confidently believed, would tend to reduce the difference in value between the two metals and to restore the equilibrium so much desired. It would furnish a perfectly sound currency to take the place of retired national bank notes, and thus prevent the contraction feared from that source.

Fifth—It would meet the wants of those who desire a larger volume of circulation by the introduction of a currency which being at all times the equivalent of gold, would freely circulate with it, and thus avoid the danger of contraction, which lurks in the policy of increased or free coinage of silver, by reason of the hoarding or exportation of gold.

Sixth—It should not encounter the opposition of those who deprecate inflation, for though the volume of currency may be somewhat increased, the notes would be limited to the surplus product of silver, and each dollar thus issued would be absolutely sound, and would represent an amount of bullion worth a dollar in gold.

Better for Silver-Producers.

Seventh—It would be far more advantageous to silver-producers than increased coinage under existing law, for in both cases bullion would be paid for at its market value, and under the plan proposed a much larger amount could be used with safety, and while increased coinage would arouse the fears and encounter the opposition of a very large and powerful class of people, it is believed that this measure would meet with their acquiescence.

Eighth—There would be no possibility of loss to the holders of these notes, because in addition to their full face value in bullion they would have behind them the pledged faith of the Government to redeem them in gold or its equivalent in silver bullion.

Ninth—The adoption of this policy and the repeal of the Compulsory Coinage Act would quiet public apprehension in regard to the overissue of standard silver dollars, and the present stock could therefore be safely maintained at par.

Tenth—This plan could be tried with perfect safety, and, it is believed, with advantage to all our interests. Should it prove a successful and satisfactory plan for utilizing silver as money, other nations might find it to their interest to adopt it without waiting for an international agreement, and should concerted action be deemed desirable, it could then be more readily secured.

By this method it is believed that the way would be paved for the opening of the mints of the world to the free coinage of silver and the restoration of the former equilibrium of the money metals.

The Celebrated H. H. H Liniment.



The **H. H. H. Liniment** is for the treatment of the Aches and Pains of Humanity, as well as for the ailments of the beasts of the fields. Testimonials from importers and breeders of blooded stock prove its wonderful curative properties. No man has ever used it for an ache or pain and been dissatisfied.

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QUICKSILVER

For Sale in Lots to Suit by

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306 California St., San Francisco, Cal.

Assessment Notices.

Booth Gold Mining Company. Location of principal place of business, San Francisco, California. Location of Works, Auburn, Placer Co., Cal.

NOTICE is hereby given that, at a meeting of the Board of Directors, held on the 23d day of November, 1889, an Assessment, No. 4, of Two(2) Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin, to the Secretary, at the office of the Company, No. 310 Pine Street, Room No. 28, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of December, 1889, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the 20th day of January, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

GEO. R SPINNEY, Secretary,

Office, No. 310 Pine Street, Room No. 28, San Francisco, California.

DELINQUENT SALE NOTICE.

Gray Eagle Mining Company, Location and principal place of business, San Francisco, California. Location of Works, Placer Co., Cal.

NOTICE.—There are delinquent upon the following described Stock, on account of Assessment (No 15), levied on the 16th day of October, 1889, the several amounts set opposite the names of the respective Shareholders, as follows:

NAMES.	No. Certificate.	No. Shares.	Am't.
Brown, G. A.	463	100	$ 6 00
" G. A., Trustee	484	5,000	300 00
" " "	465	2,500	150 00
Bogart, O. H., Trustee	414	500	30 00
" " "	428	100	6 00
" " "	430	100	6 00
" " "	431	100	6 00
" " "	432	100	6 00
" " "	433	100	6 00
" " "	435	50	3 00
" " "	436	100	6 00
" " "	447	5,000	300 00
" " "	470	1,000	60 00
" " "	484	200	12 00
" " "	485	200	12 00
Colton, A. O., Trustee	243	100	6 00
" " "	244	100	6 00
Carnes, W. A.	254	416	24 96
Chase, Q. A., Trustee	419	3,814	228 84
Durning, T. G., Trustee	231	440	26 40
Ettlinger Isaac	137	600	36 00
Field, W. A.	403	100	6 00
Francis, H. L., Trustee	444	1,500	90 00
Gray, H. W., Trustee	446	200	12 00
Horton, Thos. R., Trustee	315	5,000	300 00
Hersey, C. S.	95	2 0	12 00
Hall, Wm. E.	131	900	54 00
" " "	154	1,000	60 00
Hall, Wm. E., Trustee	411	200	12 00
" " "	412	200	12 00
Nash, H. W.	269	104	6 24
Rosekrans, H. M.	39	600	36 00
Riordan, Thos. D.	491	12	72
" Thos. D., Trustee	415	500	30 00
" " "	416	500	30 00
" " "	417	500	30 00
" " "	418	500	30 00
" " "	492	500	30 00
Stout, C. S.	486	100	6 00
" " Trustee	422	100	6 36
" " "	476	2,000	120 00
Searles, W. A., Trustee	129	250	15 00
" " "	322	250	15 00
" " "	429	1,040	62 40
Shankland, Robt.	144	600	36 00
" "	173	400	24 00
Taylor, J. N.	102	1,000	60 00
" "	330	40	2 40
Waller, L. P. F., Trustee	358	100	6 00
" " "	367	3,000	180 00
" " "	458	100	6 00
" " "	459	100	6 00
" " "	460	100	6 00
Winn, A. H., Trustee	486	1,000	60 00
Wetzel, Theo., Trustee	337	40	2 40
" " "	360	1,000	60 00

And in accordance with law, and an order of the Board of Directors, made on the 16th day of October, 1889, so many shares of each parcel of such Stock as may be necessary, will be sold at public Auction, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California, on TUESDAY, THE TENTH (10th) DAY OF DECEMBER, 1889, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

J. M. BUFFINGTON, Secretary.

Office, Room 11, No. 303 California St., San Francisco, California.

POSTPONEMENT.

At a meeting of the Board of Directors of the Gray Eagle Mining Company, held this day, the day of sale of the above delinquent stock was postponed until Friday, the Third (3d) Day of January, 1890, at the hour of one (1) o'clock P. M.

San Francisco, Dec. 10, 1889.

J. M. BUFFINGTON, Secretary.



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On Market St., corner of Tenth, is the most realistic and interesting picture ever produced. Read what General Howard says of it in our Catalogue.

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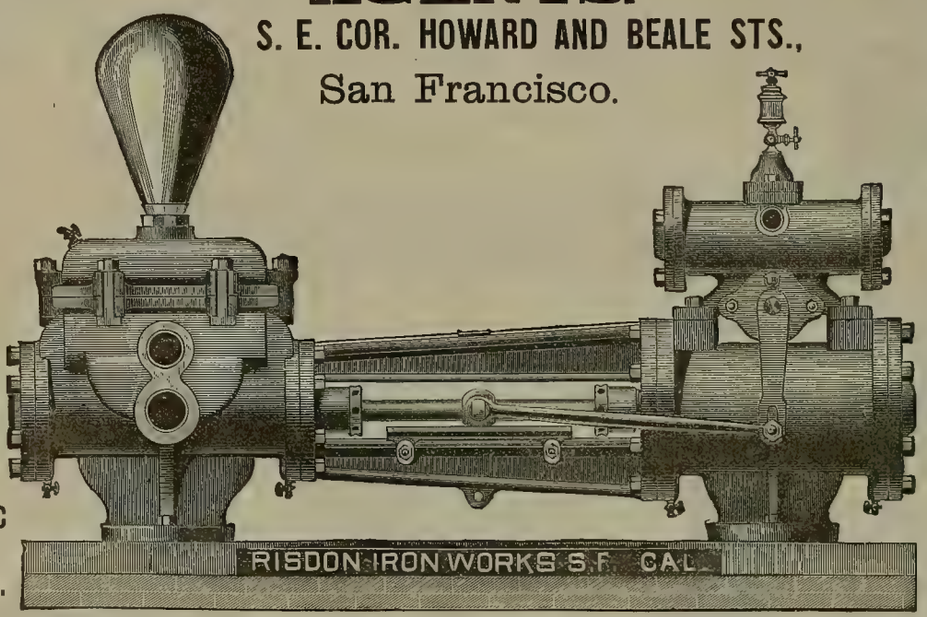
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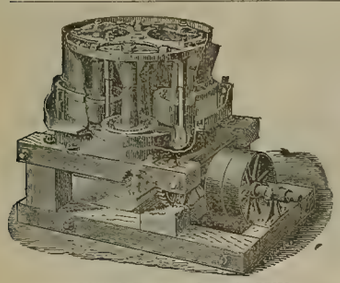
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Fire Pumps,
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Sugar House Pumps,
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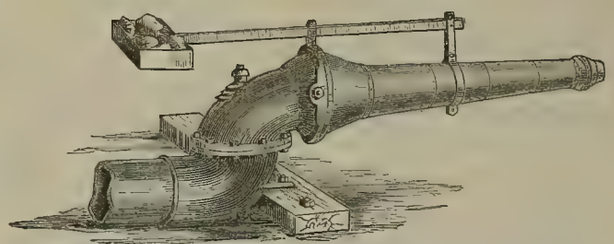
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California Inventors Should consult DEWEY & CO. AMERICAN AND FOREIGN PATENT SOLICITORS, for obtaining Patents and Caveats. Established in 1860. Their long experience as journalists and large practice as Patent attorneys enables them to offer Pacific Coast Inventors far better service than they can obtain elsewhere. Send for free circulars of information. Office of the MINING AND SCIENTIFIC PRESS and PACIFIC RURAL PRESS, No. 220 Market St., San Francisco Elevator, 12 Front St

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One 50-ton, wrought iron, water-jacket Smelting Furnace (36″x60″ at the tuyeres) of the latest design, with Crusher, Blower, Boiler, Pumps, Engines, Tools, and everything complete for immediate delivery, and only used about six months. Cheap for cash, or will exchange for interest in a Lead-Silver Mine, or erect in any mining camp that will guarantee a certain output. For further particulars address Box 23, Elkhorn, Montana.

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Stamp Mills for Wet or Dry Crushing. Huntington Centrifugal Quartz Mill. Drying Cylinders. Amalgamating Pans, Settlers, Agitators and Concentrators. Retorts, Bullion and Ingot Moulds, Conveyors, Elevators, Bruckners and Howell's Improved White's Roasting Furnaces, Etc.

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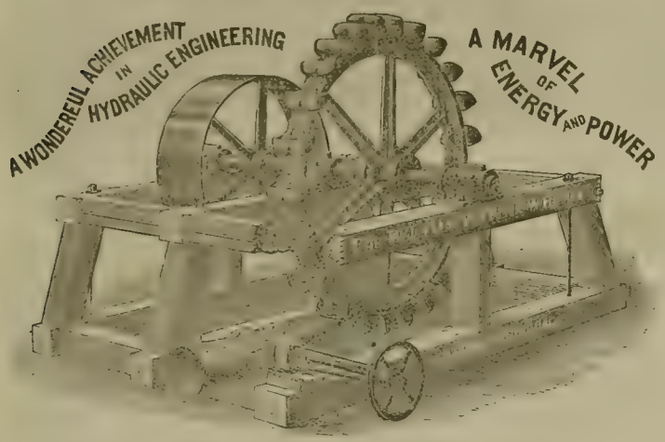
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GIVES THE HIGHEST EFFICIENCY OF ANY WHEEL IN THE WORLD.



OVER 800 ALREADY IN USE.

Affords the Most Simple and Reliable Power for all Mining and Manufacturing Machinery.

Adapted to heads running from 20 up to 2,000 feet.

From 12 to 20 per cent better results guaranteed than can be produced from any other Wheel in the Country.

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Power from these Wheels can be transmitted long distances with small loss, and is now extensively used in all parts of the country for generating both power and light.

APPLICATIONS

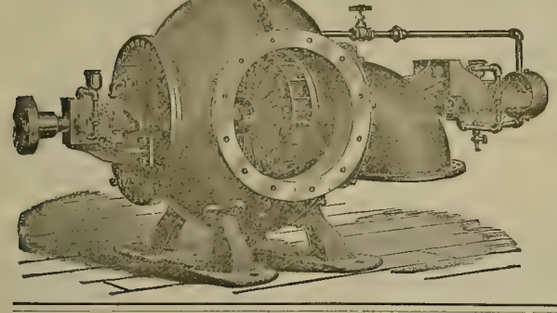
Should state amount, and head of water, power required, and for what purpose; with approximate length of pipe; also, whether the application is with reference to *Wheels* or *Motors* described below. SEND FOR CIRCULARS.

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PELTON WATER MOTORS.

Varying from the fraction of 1 up to 15 and 20-horse power. Unequaled for all light-running machinery. Warranted to develop a given amount of power with one-half the water required by any other. ☞ SEND FOR MOTOR CIRCULAR. ADDRESS AS ABOVE. ☜



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Mining Turbine Water Wheel.

These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

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Ores worked by any Process.

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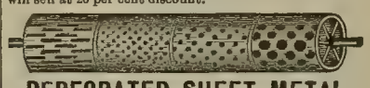
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Dec. 12, 1889.

General trade is very quiet—heavy rainfalls interfering with the distributive demand. Money is easy, considering that taxes are being paid and that general annual settlements will soon be in order. After the holidays the money market is expected to rule very easy.

MEXICAN DOLLARS—The market has been fairly active under buying for shipment by steamer leaving for China on Saturday of this week. From first hands quotations are given at 77½ cts.

SILVER—As indicated would be the case in last week's paper, the market has been gaining in strength. This is due to the position taken by Secretary Windom and also to the acknowledged fact that Congress will act in favor of silver. Another factor is the English mint being again in the market. There is no denying but the better informed begin to agree with the position of the PRESS that the world's gold production is increasing quite rapidly, while that of silver shows very little change, and consequently the white metal is likely to be the scarcer of the two. The failure of active explorations on the Comstock in uncovering a large silver bonanza, with the percentage of gold increasing in the bullion output, and work in the leading mines running toward the gold lode, are very important facts bearing on silver. If they find, which they undoubtedly will, a high-grade gold lode on the Comstock, and one or two outside districts develop large lodes of high-grade gold, the change of silver for the better will be quite marked. During the past week there has been quiet buying of silver in our market at advancing prices from 96 cts. up to 97 cts, yestesday (Wednesday).

QUICKSILVER—The market shows considerable strength. There is a growing confidence of more activity next year than witnessed for several years past. Receipts the past week aggregate 390 flasks.

BORAX—The market is quiet but firm at current quotations. Receipts the past week aggregate 372 ctls.

LIME—Receipts the past week aggregate 1754 bbls., and exports by sea 1230 bbls. to Honolulu and 250 bbls. to Kahului. The market is dull and easy.

LEAD—The market holds to steady prices. English and Eastern advices report the market fairly active, with an undertone denoting considerable strength. The Australian output is being closely watched.

COPPER—The exports by sea the past week aggregate as follows: To New York 20,200 lbs. copper cement. From the New York *Iron*, Dec. 5th, we obtain the following cable advices: Consumers purchase freely, and Birmingham firms and buyers for the Continent operated heavily. Smelters are reported to be comparatively bare of stock. It is believed that the adoption of the new smokeless powder by the German Government will lead to a large increase of consumption of copper in the manufacture of cartridge-cases. The report has circulation that the Cape Company and other London-owned mining concerns have sold their entire stock, and German representatives are said to have contracted for the greater part of the entire production for months ahead. If the German Government adhere to the new powder it is believed that the requirements of copper for cartridge manufacture will be equal to nearly the entire European production. Secret negotiations have, it is reported, been carried on by the French Government, and their agents are said to be endeavoring to secure any supplies that the Germans have not monopolized. The stock originally held by the late syndicate has been reduced 60,000 tons in eight months, and it is believed that a further considerable reduction of the holdings will be made without bad effect upon the market. The stock remaining unsold is held by four bankers.

CHROME ORE—Exports by sea the past week aggregate 194,390 lbs. to New York. The market and mines are without any particular change to note.

TIN—Imports the past week aggregate 40,223 boxes of plate from England. The exports aggregate 280 boxes of plate to Mazatlan. The local market shows a stronger tone for spot, due to high prices abroad, shipments to arrive contracted for and the near approach of the can-making season. European advices report a strong and fairly active market for both pig and plate.

IRON—Imports the past week aggregate as follows: From Hull, 100 tons; Liverpool, 135, and Newcastle (England), 300. The market is lifeless, yet holders are not disposed to make concessions so as to effect sales. The close of the year has an unfavorable bearing on the market.

COKE—Imports the past week aggregate as follows: From Antwerp, 300 tons, and 650 tons from Newcastle, Eng. The market is reported stronger, with higher prices to buy.

COAL—Imports the past week aggregate as follows: From Seattle, 6945 tons; Coos Bay, 750; Departure Bay, 4255; Nanaimo, 2184; Sydney, 4100; Swansea, 2379; Tacoma, 4600; New York, 100; total, 25,313 tons. The market is reported unchanged, although in some grades more activity is noted. The mild weather is against any decided consumptive demand for household coals. Steam coals are in fair inquiry, but consumers are for present requirements reported to be well stocked. Outward freights from Australia continue to rule strong at high figures, owing to crop prospects promising the largest outturn on record.

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian ...	7 75 @ 8 00	Cardiff	9 50@10 00
Liverpool St'm	8 50 @— —	Lehigh Lump..	16 50@17 00
West Hartley.	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint.	9 00 @ 9 00	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Seattle	7 00
Scotch Splint	9 00	Coos Bay	6 00
Greta	9 00	Cannel	12 00
Westminster Brymbo.	9 00	Egg, hard	18 00
Nanaimo	9 00	Cumberland, in sacks	19 00
Sydney	8 00	do, bulk	18 00
Gilman	7 0		

Eastern Metal Markets.

By Telegraph.

NEW YORK, Dec. 12, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	43¾	94¾	$14 00	$3 85	$21 50
Friday	43¾	94¾	14 00	3 85	21 50
Saturday	43¾	95	14 00	3 85	21 25
Monday	44	95⅝	13 90	3 85	21 00
Tuesday	44	96⅜	14 00	3 85	21 00
Wednesday	44½	95⅝	13 90	3 85	21 15

NEW YORK, Dec. 12.—Spot business in copper light, but prices fairly supported. Lake Ingot, $14.50; wire bars, $14.75; Arizona, $13.50; casting, $13; futures, February, $14.30; March, $14.25; April, $14. Lead restricted to light wants of consumers $3.80@3.85 full for spot or near future. Quicksilver is fairly steady. Iron is very firm.

LONDON, Dec. 6.—The copper syndicate holds less than 130,000 tons of that metal taken from the Societe des Meteaux. It is the intention of the syndicate to maintain the price of copper at £50@55 ₱ ton. Should the price fall below £50 the syndicate will cease selling and even buy. It is believed the syndicate is competent to sustain its project.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, December 5, 1889.

ANTIMONY—	25 @	—
BORAX—Refined, in carload lots	7¼@	7⅝
Powdered " "	7½@	—
Concentrated " " "	— @	6¾
All grades jobbing at an advance.		
COPPER—		
Bolt	21 @	22
Sheathing	22 @	24
Ingot, jobbing	17 @	18
do, wholesale	15 @	16
Fire Box Sheets	22 @	24
LEAD—Pig	4¼@	4½
Bar	5 @	—
Sheet	7 @	—
Pipe	6 @	—
Shot, discount 10% on 500 bags Drop, ₱ bag.	1 45 @	—
Buck, ₱ bag	1 65 @	—
Chilled, do	1 85 @	—
STEEL—English, lb	16 @	20
Canton tool	9 @	9
Black Diamond tool	9 @	9
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4¼@	—
TINPLATE—B. V., steel grade, 14x20, P. S.	5 25 @	5 50
B. V., steel grade, 14x20, spot	4 90 @	5 10
Charcoal, 14x20	6 75 @	7 00
do roofing, 14x20	5 50 @	—
do, do, 20x28	11 00 @	—
Pig tin, spot, ₱ lb	23 @	25
COKE—Eng., ton, spot, in blk & sks, resptvly	14 00 @	16 00
Do, do, to load	16 00 @	—
QUICKSILVER—By the flask	48 00 @	48 50
Flasks, new	35 @	—
Flasks, old	35 @	—
CHROME IRON ORE, ₱ ton	10 00@	—
IRON—Bar, base	3 @	3½
Norway, base	4½@	5¼

	Spot.	To Load.
IRON—Glengarnock ton	35 00 @—	34 @ —
Eglinton, ton	35 00 @—	32½@ —
American Soft, No. 1, ton	— @35 00	32½@ —
Oregon Pig, ton	— @35 00	— @ —
Clay Lane White	— @38 00	27 @ —
Shotts, No. 1	35 00 @35 00	32½@ —
Bar Iron (base price) ₱ lb	— @ —	— @ —
Langloan	35 00 @—	34 @ —
Thorncliffe	35 00 @—	34 @ —
Gartsherrie	35 00 @—	34 @ —

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$20 00	$17 00
41 to 50 ft	21 00	18 00
51 to 60 ft	23 00	20 00
61 to 70 ft	27 00	21 00
1x3, fencing	19 00	16 00
1x4 "	21 00	18 00
1x3, 1x4 and 1x6, odd lengths	19 00	16 00
Second quality	17 00	15 00
Selected	24 00	22 00
Clear, except for flooring	31 00	28 00
Clear for flooring	2 00	.....
Clear V. G. No. 1 flooring	6 00	.....
Firewood	14 00	10 00
Dressed Pine, flooring, No. 1, 1x6	32 00	29 00
No. 1, 1x4	34 00	30 00
No. 1, 1¼x4, 1¼x6, and odd sizes	37 00	33 00
All sizes, No. 2	27 00	24 00
Stepping, No. 1	44 00	35 00
Stepping, No. 2	34 00	25 00
Ship timber and plank, rough	27 00	18 00
Selected, planed 1 side, av'ge 40 ft	29 00	24 00
" " 2 " " "	31 00	26 00
" " 3 " " "	33 00	28 00
" " 4 " " "	35 00	30 00
Deck plank, rough, average 35 ft	35 00	32 00
Dressed, average 35 feet	40 00	35 50
Pickets, rough, B. M	20 00	16 00
½x1½, 4 ft long, ₱ M	6 50	5 00

Mining Personals.

At a special meeting of the Boards of Directors of the Navajo, Belle Isle, North Belle Isle and North Commonwealth and Del Monte mines of the Tuscarora district, W. C. Price, the superintendent, presented his resignation. As Superintendent Price stated his action was prompted from a necessity for rest and vacation from business, it was accepted. R. M. Catlin, formerly the assistant superintendent and civil engineer of the mines, will be appointed superintendent of the Belle Isle, North Belle Isle and the Navajo mines, and F. F. Coffin will be made the superintendent of the North Commonwealth and Del Monte mines. Superintendent Price, however, will retain his large interests in the several mines.

Prof. C. E. Anthony has returned from Lower California with the idea that as soon as a big smelter can be erected somewhere south there will be plenty of ore for it. He has been trying to get the Los Angeles people to subscribe, but has not been successful. The San Diego people would like to have the proposed smelter in their city.

Harry Wolcock, a miner well known in Grass Valley, who has been working some time at the Idaho mine, has had an offer to go to Honduras to engage with a mining company operating there, and will soon leave for that country. He has had mining experience in South America, and therefore is familiar with the work that is before him.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Belle Isle M Co	Nevada	13	15	Dec 4	Jan 3	Jan 30	J W Pew	310 Pine St
Bullion M Co	Nevada	35	25	Dec 4	Jan 3	Jan 24	R R Grayson	327 Pine St
Bodie Con M Co	California	11	25	Nov 11	Dec 17	Jan 22	E L Burling	309 Montgomery St
Booth G M Co	California	4	2	Nov 23	Dec 28	Jan 20	Geo R Spinney	310 Pine St
Con Imperial M Co		26	5	Nov 22	Dec 27	Jan 15	O L McCoy	329 Pine St
Calaveras Blue Gravel Co	California	4	3	Nov 15	Dec 23	Jan 14	B Burris	240 Montgomery St
California State Co	California	5	25	Oct 21	Nov 26	Dec 23	J O Hanscom	9 Mission St
Con Pacific M Co	California	11	10	Nov 1	Dec 5	Dec 28	F R Luty	330 Pine St
Chollar M Co	Nevada	28	50	Nov 1	Dec 4	Dec 24	C E Elliott	309 Montgomery St
Del Monte M Co	Nevada	2	20	Oct 28	Dec 3	Dec 26	J W Pew	310 Pine St
Golden Jacket M Co	Nevada	3	10	Oct 14	Nov 21	Dec 20	R G McClellan	331 Montgomery St
Gray Eagle M Co	California	15	6	Oct 16	Nov 18	Jan 4	J M Buffington	303 California St
Grand Prize M Co	Nevada	23	20	Nov 21	Dec 24	Jan 15	R R Grayson	329 Pine St
Kentuck M Co	Nevada	20	30	Dec 11	Jan 14	Feb 4	J W Pew	310 Pine St
Livermore Coal M Co	California	1	50	Nov 16	Dec 19	Jan 4	G C Higgins	120 Sutter St
Locomotive M Co	Arizona	5	5	Oct 19	Nov 25	Dec 17	A H Fish	309 Montgomery St
Mono G M Co	California	29	25	Nov 18	Dec 23	Jan 24	B L Burling	309 Montgomery St
North Occidental G & M Co	Nevada	1	7	Dec 2	Jan 6	Jan 27	W H Watson	302 Montgomery St
North Gould & Curry M Co	Nevada	11	20	Nov 6	Dec 7	Dec 27	O H Mason	331 Montgomery St
Nevada Queen M Co	Nevada	6	20	Oct 31	Dec 4	Dec 30	H Deas	309 Montgomery St
Palisade M Co	Nevada	2	5	Nov 1	Dec 16	Jan 9	D Buck	309 Montgomery St
Platt & Gilson G M Co	California	4	3	00 Nov 13	Dec 20	Jan 6	C Herrmann	326 Kearny St
Russell Reduction & M Co	California	5	5	Nov 11	Dec 16	Jan 8	J Morizio	328 Montgomery St
Savage M Co	Nevada	74	50	Nov 5	Dec 10	Dec 30	E B Holmes	309 Montgomery St
Sunmit G M Co	California	11	5	Nov 14	Dec 20	Jan 14	B L Burling	309 Montgomery St
Trinity River Tunnel & M Co	California	2	50	Nov 27	Jan 6	Jan 28	L H Pockman	28 California St
Utah Con M Co	Nevada	8	25	Oct 23	Nov 26	Dec 16	A H Fish	309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F	MEETING	DATE
Andes M Co	Nevada	J J E Hawkins	309 Montgomery St	Annual	Dec 18
Gould & Curry	Nevada	A K Durbrow	309 Montgomery St	Annual	Dec 15
Kennedy M Co		L F Reichting	404 Montgomery St	Annual	Dec 16
Locomotive M Co	Arizona	A H Fish	309 Montgomery St	Annual	Dec 16
Mt Diablo M Co	Nevada	R W Heath	313 Pine St	Annual	Dec 16
Ophir M Co	Nevada	E B Holmes	309 Montgomery St	Annual	Dec 18

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	AMOUNT.	PAYABLE
Champion M Co		T Wetzel	522 Montgomery St	10	Nov 25
Caledonia M Co	Nevada	A S Cheminant	328 Montgomery St	08	Aug 5
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	Dec 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	Aug 25
Idaho M Co	California		Grass Valley	5 00	Nov 7
Mt Diablo M Co	Nevada	R Heath	319 Pine St	30	Oct 23
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Nov 10

Mining Share Market.

The mining share market the past week showed more activity in the Comstocks, with Chollar and Potosi the leaders in an up move and Con. Virginia in the North Ends and Crown Point in the Gold Hills leaders on the down grade. The movements both up and down give unmistakable signs that the pool is after stock—stocks they want and stocks they will have; of this fact the outside public may make up their minds. There is no doubt but they have gathered in large lines of stock from the disgruntled, disappointed outside holders who never see anything good in the market when prices are low; they only see big things when stocks are active, high, and every other person, except insiders, want them. In outside stocks trading was slow in the Quijotoas and Bodies, but fairly active in the Tuscaroras on bull points freely circulated on the outside.

A correspondent writing from Virginia City says that the ore taken out of Kentuck on the 1300-foot level went in bullion from $40 to $60 a ton. This is four times what Gov. Stevenson, the reported controller of the mines, stated when the Kentuck case was on trial.

There are points out for lower prices of the Comstock, when there will be a buy for something big. More assessments are to be levied so as to frighten holders and give the pool an opportunity to sink prices lower.

The November bullion output of Hale and Norcross was over $85,000; Savage, over $38,000; Crown Point, $33,938; and Chollar, nearly $22,000. This month's output of the two latter promises to be larger than was that in November.

From the mines the news is of an unimportant character so far as official reports go, but private advices are very favorable and point with unerring certainty to developments within the next few months. This information comes from miners who have facilities for being the best posted on the Comstock mines. The length of time before a development is made depends upon the character of the work and also insiders' wishes. The north drifts on the various levels of the Gold Hill mines are being pushed ahead, and air connections ought to be made soon, if not already, on one or two of them. In Con. Imperial, on the 300-foot level, another west crosscut has been started. A joint west crosscut on the 800-foot level has been started by Challenge and Confidence. On the 850-foot drift in Belcher a crosscut is to be started soon. An improvement is reported in both Chollar and Potosi, but of what nature we are not advised. Work in the North End mines will bear close watching. From the outside mines all advices are of a procrastinating character—the same old "chestnut" of the past few months.

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Germania, Dec. 3, $2472; Hanauer, 3, $9500; Alice, 6, $18,688; Hanauer, 5, $4900; Savage (for Nov.), $88,932; Crown Point (for Nov.), $33,939; Hale & Norcross (for Nov.), $85 293; Hanauer, 6, $4500; Germania, 6, $2446; Occidental, 8, $5235; Con. California & Virginia, 7, $61,048; total for November, $234,422; Hanauer, 7, $2875; Eureka Con., 7, $14,800; Richmond Con., 7, $12,590. The ore and bullion receipts at Salt Lake City during the week ending Dec. 7th, were $302,604.40, as compared with $123,483.90 for the week previous.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. C. HOAG—San Francisco.
R. G. BAILEY—San Francisco.
M. D. SHRADER—Santa Clara Co.
W. W. THEOBALDS—Los Angeles Co.
E. FISCHER—Central California.
GEO. WILSON—Sacramento Co.
R. H. SCHAEFFLE—Fresno Co
C. EDWARD ROBERTSON—Humboldt Co.
FRANK S. CHAPIN—Butte and Yuba Cos.
WM. H. HILLEARY—Oregon.
E E. DEMING—Oregon.
W. B. FROST—San Luis Obispo Co.

THE Elsinore *News* says the reported discovery of a ledge of bituminous coal at the place is premature.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov. 21.		WEEK ENDING Nov. 26.		WEEK ENDING Dec. 4.		WEEK ENDING Dec. 11.	
Alpha	1.35	1.40	1 30	1.40	1.10	1 25	1.05	1.15
Alta	2.10	2.15	2.00	2.15	1.60	2.00	1.15	1.70
Andes	....	....	....	....	.45	.55	.45	....
Belcher	2 30	2.95	2.60	2.95	2.40	2 65	2.15	2.45
Best & Belcher	3.25	3.6	3.10	3.40	2 80	3.15	2.70	2.90
Bullion	.60	.65	.55	.65	....	....	.40	.60
Bodie Con	.60	.70	.60	....	.45	.55	.50	.55
Benton	....	....	9.50	....	5.00	....	4.00	....
Bulwer	.20	.30	....	....	....	....	....	....
Commonwealth	2.95	3.05	3.00	....	2 80	3.10	3 00	3.10
Con. Va. & Cal	6.50	6⅞	6.00	6.50	5⅝	6⅛	5	5⅞
Challenge	2.05	2.20	1.90	2 25	1.60	1.8	1.35	....
Chollar	1 65	1.85	1.55	1.75	1.55	2.10	1.95	2.50
Confidence	5.00	....	4¼	5¼	4.30	4.35	....	4¼
Con. Imperial	.35	....	.30	.35	.25	.30	.25	....
Caledonia	....	....	....	....	.15	.20	.15	....
Crown Point	2 55	2.75	2.50	2.70	1.90	2.55	1.65	2.15
Crocker	....	....	.30	....	.25	....	.15	....
Eureka Con	....	....	4.00	....	....	....	....	....
Exchequer	.60	....	....	....	.60	....	.35	.55
Grand Prize	.75	.75	.45	....	.60	.55	.40	.60
Gould & Curry	1.55	1.95	1.65	1.85	1 60	1.75	1.50	1.65
Hale & Norcross	3.00	3.15	2.90	3.10	2.75	3.00	2.70	2.90
Julia	.40	.45	.35	.40	.35	.35	.30	....
Justice	1.60	1.75	1.75	....	1.50	1.6	1.40	1.50
Kentuck	....	....	....	....	.85	.8	.60	.70
Lady Wash	.40	.45	.40	....	.30	.40	.25	.30
Mono	....	....	....	3.75	.35	....	....	....
Mexican	3.70	4.00	3.10	....	2.80	3.20	2.60	2.95
Navajo	....	....	.25	....	.30	....	.25	.30
North Belle Isle	1.20	1.25	1.15	.75	1.00	1.15	.90	1.20
Nev. Queen	.80	....	.70	1.30	.70	.80	.75	.85
Occidental	1.25	1.37	1.15	4.50	1.05	1.05	.75	.95
Ophir	4.50	4.80	4.00	1.00	3.75	4.20	3.65	3.90
Overman	.95	1.05	.95	1.90	.80	.95	.70	.80
Potosi	1.50	2.00	1.70	....	1.70	1.80	1.70	2.20
Peerless	.30	.35	.30	....	.20	.25	.25	....
Peer	.15	....	....	1.65	....	....	.15	....
Savage	1.50	1.65	1.40	1 55	1.25	1.50	1.40	1.85
S. B. & M	1.55	1.60	1.30	2.75	1.10	1.50	1.00	1.15
Sierra Nevada	2.55	2.85	2.50	.45	2.40	2.65	2.25	2.60
Silver Hill	.40	.45	.40	....	.35	....	.35	....
Scorpion	.25	....	.25	....	....	....	....	....
Union Con	3.30	3.60	2.90	3.45	2.80	3.15	2.55	2.80
Utah	.65	.75	.70	.90	.75	.85	.65	.80
Weldon	....	....	.15	....	....	....	....	....
Yellow Jacket	2.85	3.05	2.75	2.95	2.40	2.80	2.25	2.45
	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY, Dec. 12, 9:30 A. M.

400	Alta	340	Gould & Curry 1.50
150	Alpha 1.0	200	Julia 30c
300	Belcher 2.10	200	Hale & Nor 2.80
300	B. & Belcher 2.65	300	Justice 1.45
200	Bodie 65c	500	Mexican 2.65
100	Bullion 48c	250	N. Belle Is 1.10
50	Challenge 3	150	Occident 70
500	Chollar 2.25	110	Ophir 3 60
100	Commonwealth 3.05	830	Potosi 2.00
80	Confidence 4.10	350	Savage 1.65
600	Crown Point 1.70	150	S. B. & M 1.05
400	Con. Imperial 20c	350	Sierra Nevada 2.15
100	Con Va & Cal 4.95	150	Utah 70c
10	Eureka Con 3.20	750	Union 2.55
300	Exchequer 40c	500	W Comstock 25c
		200	Yellow Jacket 2.20

Complimentary Samples.

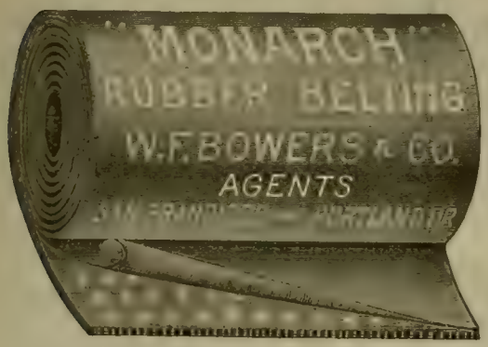
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THE Evans School of Assaying has removed to rooms 46 and 47 Montgomery Block, No. 628 Montgomery street, now occupying the place where the U. S. Geological Survey officers had their laboratory. Mr. Evans is about to start a class in chemistry as applied to mining. The new rooms are very well adapted to the requirements of the school. The prospects are quite bright for the next season.

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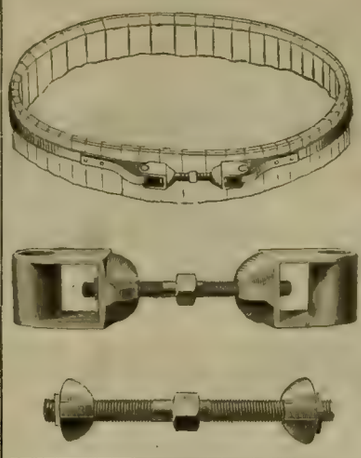
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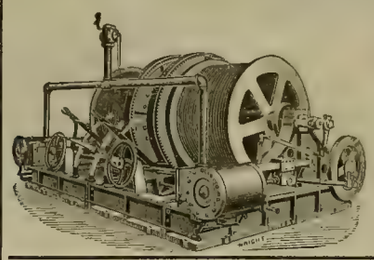


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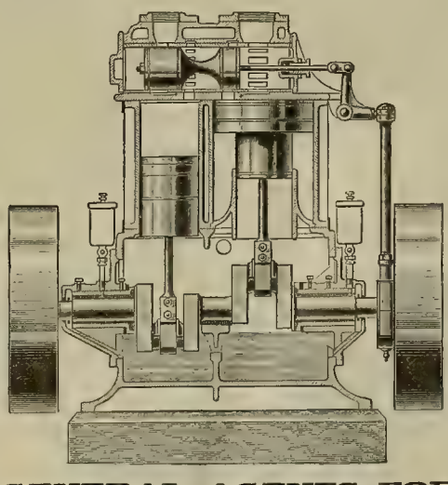
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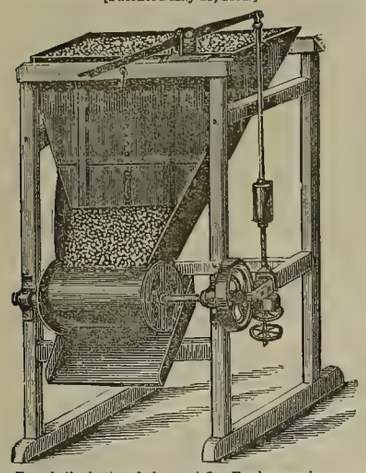
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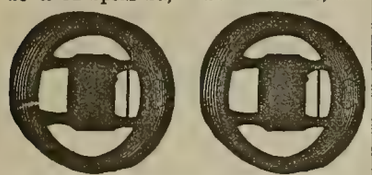


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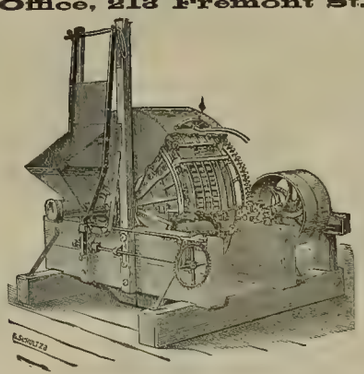
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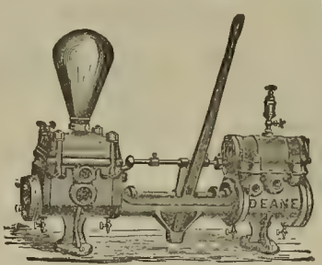
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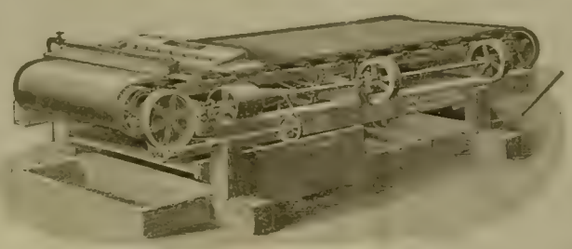
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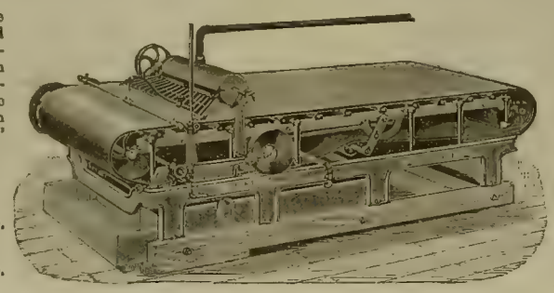
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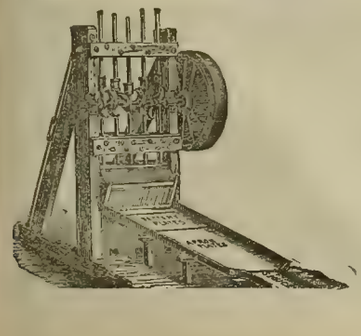
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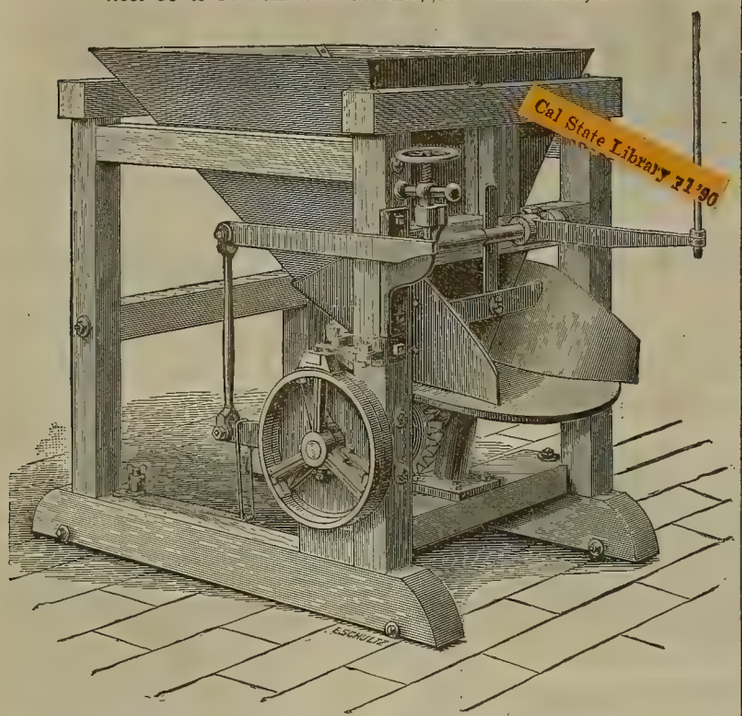
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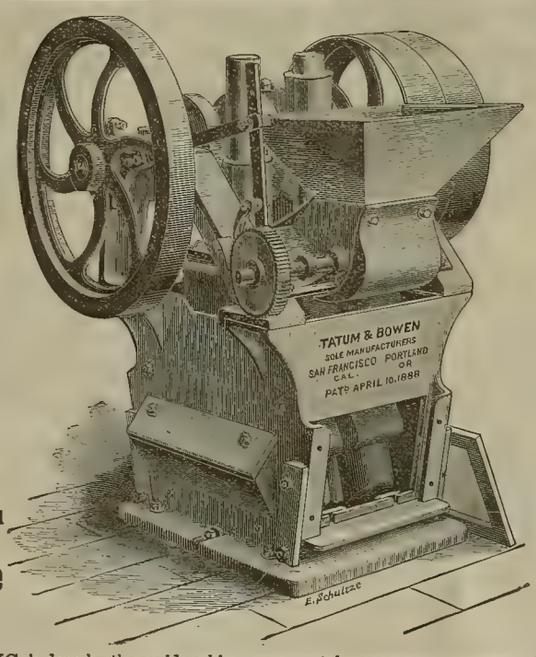
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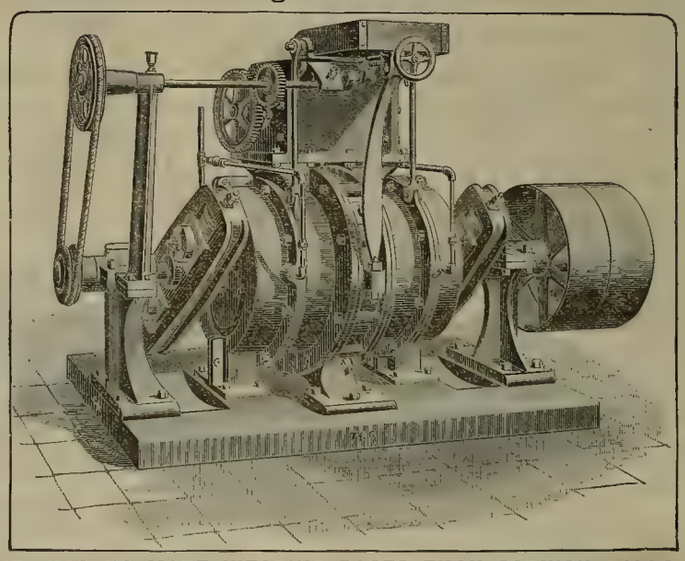
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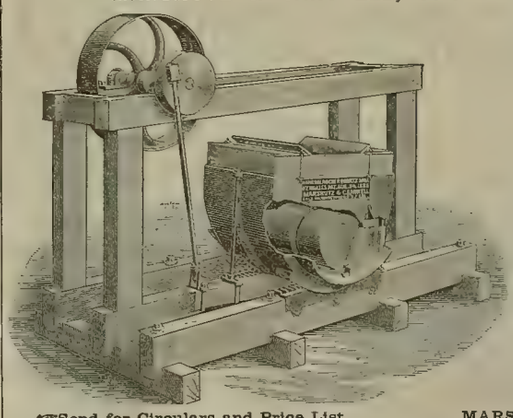
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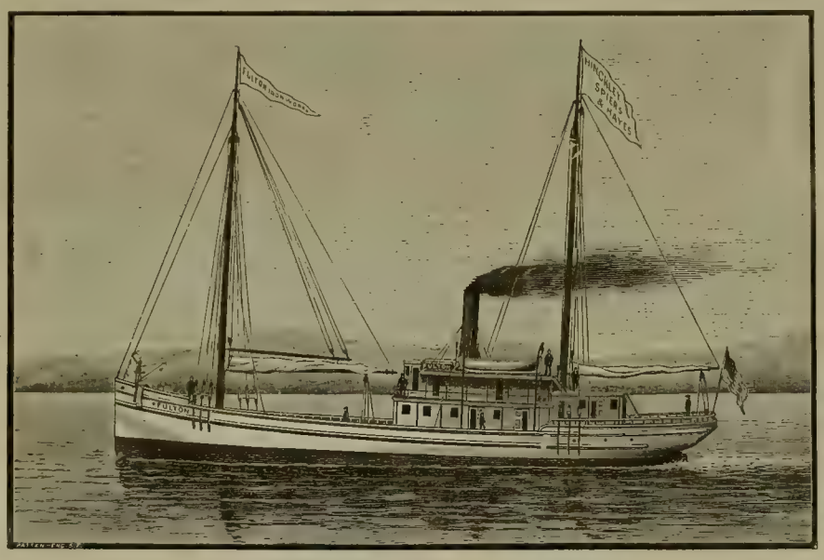
SAN FRANCISCO, SATURDAY, DECEMBER 21, 1889.

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Engines for Steam Schooners.

Within the past few years the use of steam schooners for the coasting trade has largely increased, it being found that they are quite profitable and answer the purpose better than ordinary sailing craft. Although very many have been built, they are in demand at present and the demand cannot always be met. It is probable, therefore, that a number more will be built the coming season.

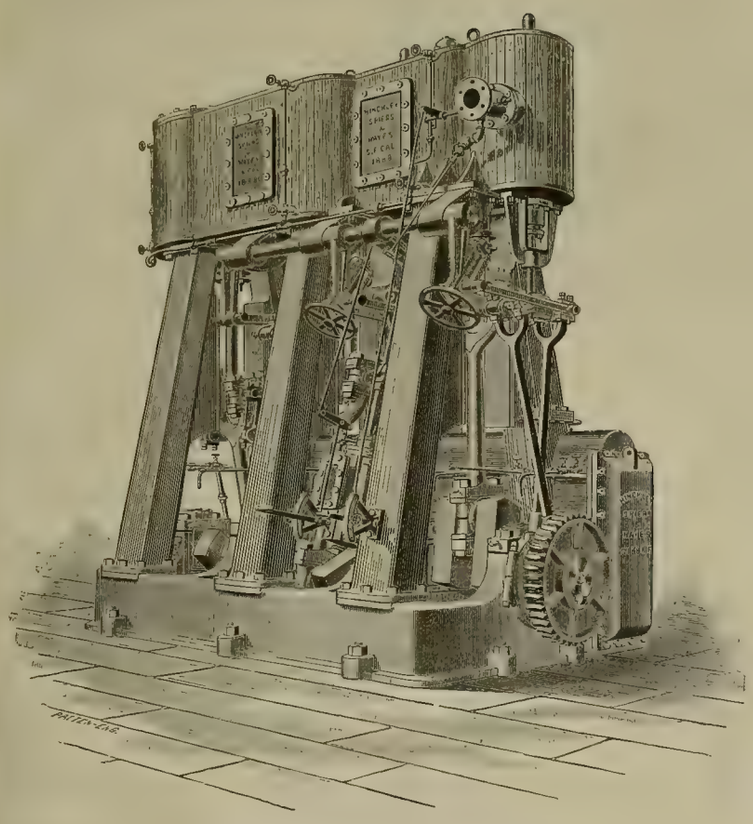
The Fulton Iron Works of this city has made a specialty of the machinery of these schooners and makes several types of engines particularly adapted to this class of vessel. Among these is the "compound tandem" engine illustrated on this page. For smaller vessels this is a very convenient engine, being light, compact and inexpensive. They work with equal efficiency to the ordinary compound, though in this type one cylinder is immediately over the other. The only objection made to this class of engines is that it may "stick" in the center. This objection, however, has no more weight than it has against any ordinary rough crank-engine, some of which are used in our large tugs, like the Monarch. An engineer of any experience can prevent any difficulty.



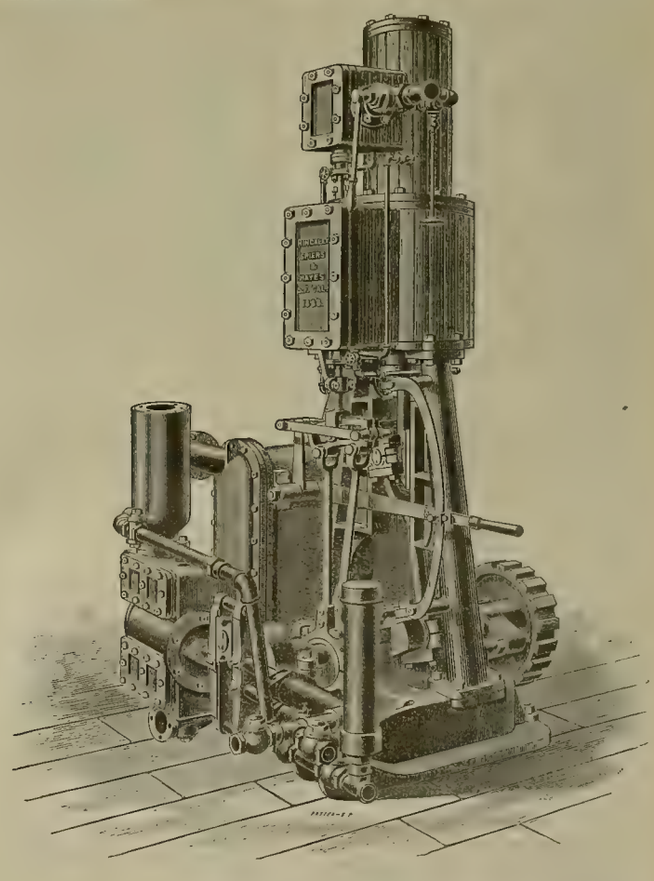
STEAM SCHOONER FOR THE COASTING TRADE.

Another engine made by these works for steam-coasters is the triple expansion of the type shown in the cut. They work with great economy, comparatively little fuel being used, which is a point to be gained in these vessels, which have little room for coal. In order to obtain economy in these engines the steam must enter the first cylinder with pressure of 140 to 160 pounds. The practical object of using the three cylinders instead of two or one is to obtain as great a uniformity of temperature in each cylinder as possible, in order to prevent condensation which occurs in long cylinders. There are many of this type of engines in use on this coast. The style of engine here illustrated has been placed in the steamers Ajax, Farralones, Noyo, Point Loma and National City.

An engraving is herewith given which illustrates the type of steam schooners in use on this coast. Most of them are employed in running to and from the lumber ports, and in carrying produce of different kinds. They make their trips regularly, and with sufficient speed for freight purposes.



TRIPLE-EXPANSION MARINE ENGINE.



COMPOUND TANDEM ENGINE.

NATURAL GAS.—A company has been organized at Salinas to bore for natural gas. The stock has all been sold and work will be commenced early next year. Natural gas has been discovered near Salinas several times during the past few years and at a depth of from 80 to 100 feet, but this company proposes to go deep, and if possible, get something permanent, as the flow from those already discovered was not of sufficient quantity to be utilized with any degree of satisfaction.

THE pottery at Lincoln keeps 165 men steadily at work. Their salary-roll amounts to $8000 a month.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Mariposa County.

Mines Off and On the Grant.

[From Our Own Correspondent.]

EDITORS PRESS:—Outside of the county the general impression is that all the mineral wealth of this county is on the Mariposa Grant. In consequence the county is seldom visited by experts in search of mining property of proven value. While the grant contains large areas of mineral-bearing ground, the county holds within its limits a vast mineral territory that when tested has proven equal in extent and richness to the mines on the grant. From Tuolumne Co. via Coulterville, until near Bear Valley, the mother lode stretches along mile after mile before it strikes the grant.

On this Belt

Are innumerable prospects only awaiting capital to prove them mines of value. Independent of the mother lode, but on what might be called the "mother lode belt," are a number of developed properties that will well repay a visit of inspection by mining capitalists.

Hornitos.

Within 16 miles of Hornitos is a group of mines that with a small outlay of capital in addition to that at present invested, would prove very valuable. The group includes the Moorehill, Rand & Wallace and Francis mines. The vein is in contact with slate for hanging and granite for foot-wall. The course of the vein is northwest and southeast and the pitch about 35 degrees. The lode crosses Mariposa creek, which furnishes water for batteries thoughout the entire season and sufficient flow for water-power during seven months of the year. The first mine is

The Moorehill,

Owned by Mr. J. W. Craighan of Hornitos. A shaft 110 feet in depth shows a vein of an average width of six feet, with two feet on the footwall of heavily mineralized ribbon-rock; 26 tons of rock from this shaft milled 31 ounces of gold. The average milling value of the vein is from $15 to $20 in free gold and 5 per cent of sulphurets worth $80 to $90 a ton.

The mine crosses Mariposa creek, and from its banks a tunnel 70 feet long has been driven on the vein. This can be continued throughout the entire length of the mine and backs be obtained of an average depth of 250 feet. Adjoining the Moorehill on the southwest is

The Rand & Wallace.

This location is developed by a tunnel 40 feet in length, which shows a vein 4½ feet in width of quartz carrying free gold and galena sulphurets. From this claim a large amount of gold in the shape of specimens has been extracted; none of the rock has been milled to test its value, and as assays prove nothing, I will not quote them, but state that the rock is similar to that of the Francis, which joins it on the northeast.

The Francis.

This mine is owned by F. Olcese of Hornitos. It is developed by tunnel No. 1 of 350 feet in length, with crosscut from the end of tunnel 80 feet long, which cuts the vein at a depth of 80 feet. Tunnel No. 2 is 250 feet long, being driven on the vein which shows an average width of seven feet, at 130 feet deep, running from $8 to $10 in free gold, and carrying 20 per cent of sulphurets that go from $75 to $90 a ton. A shaft has been put down on the vein 300 feet from the east end, which shows in its 80 feet of depth a vein averaging four feet, very evenly mineralized; the surface ores from this shaft milled $18 a ton. The tunnels on the mine can be continued from Mariposa creek on through the entire 3000 feet of the property.

A 10-stamp mill with two Frue concentrators is in operation on the mine. In looking at this ore I see that it carries the same antimonial silver ore that is characteristic of the mines of Ophir, Placer county. While none of the present owners will admit that there is silver ore in the vein, its presence is evident to the naked eye. Once the vein is worked below water level, this class of ore will, without doubt, come in as heavily as in the Hathaway of Ophir, and in consequence double the present value of the rock. These mines could be worked as one or separately. Wood and water free is to be had on the mine. All that is required is capital to develop, equip and work the mines in a practical way.

On the Enterprise,

Near Hornitos, the vein has been developed to a depth of 115 feet by shaft, on a two-foot vein, giving $9.75 in free gold, with sulphurets running as high as $2000 to the ton. At present the mill is running on custom rock from prospects in the immediate vicinity.

Eureka, or Quartz Mountain, Mine.

This is two miles south of Hornitos and is the property of Mr. M. L. Rodgers. The vein has a dip of 42 degrees, with slate walls. A main working shaft has been put down on the center of the 1500-foot of the mine to a depth of 200 feet. From the bottom of the shaft a drift has been run north 40 and south 60 feet. The vein in the north drift averages ten feet in width, while the south shows seven feet. The ore is free gold and sulphuret. All along the surface numerous shafts have been sunk in the earlier workings by Mexicans, the ores from which yielded by arastra as high as $80 to the ton. The ore extracted from the present shaft and drifts gave an average of $5 to the ton in free gold, and 4 per cent of sulphurets of $50 a ton value. Some 200 feet of backs can be obtained from the bottom of the present shaft.

There is on this mine a complete ten-stamp mill, hoist, air-compressor, Burleigh drills, pumps and all the necessary buildings, all in first-class order. The hoist is capable of sinking to a depth of 2000 feet. This property can be bought for less than the cost of the improvements at this time.

The Dorse mine joins on the west. On this a ten-foot shaft has been put down on a ten-foot vein of rock which milled $8 to the ton. Adjoining this is the Brooks, where a shaft 130 feet deep on a vein 6 to 12 feet wide shows $13 rock. The Carr mine joins this; the workings on it are only superficial. Here are four locations of 1500 feet each on a vein that is proven to exceed an average of eight feet in width, and worth $8 to the ton. Either of these mines can be worked separately or the whole under one consolidation. All this group requires is the necessary capital to either transmit power by electricity from the Merced river or a railway to the river from the mines. The entire belt or group can be secured at a nominal cost, and in the hands of capitalists, the property could be put on a working basis of $2 a ton, thus leaving $6 per ton profit. As at present situated, Mr. Rodgers does not feel able to equip it so as to bring the cost of working down to $2, and to work the mine with its present plant is only wasting the ore in unnecessary expense. Capitalists desiring a large property containing a large body of fair-grade gold ore will find this group worthy of inspection.

From Coulterville across to the Grant, numerous claims are being worked in a small way. The Cathay mine, which joins the Grant mine on the northwest, is now down 100 feet on good rock, though the owners content themselves for the present with the pockets encountered. The average of the vein matter is up to that on the mother lode, on which it is located.

The Champion

Mine is five miles from Mariposa. The property is under development by Chicago capitalists. Their shaft is now down 90 feet, and a drift has been run 150 feet on the two ledges of rock, running from $2 to $16 to the ton, with two to eight feet of vein matter. The owners are very sanguine, and have every reason to believe that the mine will, when developed and equipped, prove a dividend-payer.

Mariposa M. & M. Co.'s Mines.

This company's property embraces the entire Mariposa grant of 44,000 acres, and an unbroken stretch of 20 miles on the mother lode and its accompanying ledges. Naturally, all Mariposa county sits and waits for the development and operation of this immense property. Once it is put in full operation, this property alone will make Mariposa as lively as she is now dull; and with the successful working of these mines, other capital will flow in to develop the other mines of the county. It is not necessary for me to dwell upon the early history of this famous property. At the present time the company is confining its work to a point two miles north of Bear valley, and within half a mile of the old Pine Tree workings. Here, under the management of Mr. J. W. Cross, the superintendent, very large bodies of high grade, free-milling rock have been developed in the present system of tunnels and crosscuts. From the main working tunnel three crosscuts have been driven. In No. 1 the first vein struck is the Josephine, which here shows a width of 30 feet of rock, running from $15 to $20 to the ton. Continuing, the crosscut next encounters the west branch of the Josephine, which averages 16 feet in width of ore of similar value. Still farther on and the Pine Tree ledge is cut, showing 30 feet in width of rock running $6 to $8 to the ton. In crosscut No. 2 the same veins are encountered, but show that they are gradually going nearer to each other, while the size and character of the rock remain the same as in the No. 1 crosscut. As the tunnel continues on its course east, the ledges join and form one vein, 40 feet in width. All of the work at the present time is in development. Chinese miners are employed exclusively, and all the work conducted on a most conservative basis. On the Princeton, which is seven miles southeast of Bear valley, it is the intention of the superintendent, Mr. Cross, to put down a 1000-foot shaft the coming spring. Just what action the owners, Messrs. Hayward, Hobart, Mackey, and Jones Bros., will take is unknown. That the ores are in large bodies, and the grade unusually high for so large a vein, is now proven, and it is not to be supposed that with these facts proven the wealthy mining operators who own the property will long allow this great wealth to lie undisturbed, especially as Mr. Hayward is now credited with owning the controlling interest. Once this property is in full operation, Mariposa will awake to find herself famous and her mineral equaling her scenic wealth.

E. H. SCHAEFFLE.

THIS year 125,000 French Canadians have come to our side to get work. The amount of money they take to Canada on their return will count high up in the millions. If only $150 each, a moderate amount, for the Canadian French are a prudent, saving people, they will deplete the United States of nearly nineteen millions of dollars.

A Californian in British Columbia.

EDITORS PRESS:—On the 18th of September myself and wife took our departure from San Francisco for Victoria and Port Vancouver, B. C., on the Canadian Pacific steamer Pueblo. The voyage was a pleasant one to Victoria, which place we reached in two days. The accommodations on the steamer were first-class. The officers and servants on the boat were pleasant and polite in their intercourse with the passengers. At Victoria we had to wait till 4 o'clock next morning for a steamer to convey us to Port Vancouver, the western terminus of the Canadian Pacific, which point we reached about 10 o'clock the next morning. The voyage on the sound was most delightful and picturesque. The water was smooth as a mill-pond, disturbed by no ocean swell—nothing to cause nausea to the most susceptible to seasickness. Our way over the waters of the sound was encompassed by numerous islands covered from shore to summit with a dense growth of pines and cedars clothed in living green.

Victoria

Is a well-built city of about 30,000 inhabitants. It contains many fine structures, mostly of brick, among which are the Government buildings, erected in the center of spacious and well-kept grounds. It has a large park, well laid out, shaded with noble forest trees, well trimmed up, but sedulously preserved. Its streets are wide and well kept, and its surroundings are pleasant. But unfortunately for its future growth and commercial prosperity, its site was not well chosen. Located as it is upon an island surrounded on all sides by deep water, it can never be reached by railways, those great arteries of modern commerce. In the future, it must depend for its prosperity on its local trade in lumber and on its fisheries. Its Frazer River trade, heretofore its chief source of prosperity, is now being rapidly extinguished, by reason of the superior facilities for trade offered by Port Vancouver, distant from New Westminster, at the mouth of Frazer river, only 12 miles, with good water communications and soon to be connected with Vancouver by railway. Other places will soon grow in commercial importance, but Victoria must in the nature of things remain stationary.

Port Vancouver

Is the Pacific terminus of the Canadian Pacific railway. Located on the sound, its harbor is among the best on the Pacific Coast. It is easy of approach by sea—no bar to obstruct the passage of vessels of any draft into port. It is three days nearer by steamship to Asiatic ports than is San Francisco. It offers great advantages as a commercial emporium for the Pacific ocean commerce. The Canadian Pacific Railway Co. has a line of steamers plying between Vancouver and China and Japan. The natural condition is such that this great transportation company can, it seems to me, successfully compete with any other company for the Asiatic trade. The company own their coal mines wherewith to coal their steamers, then the three days less time required to make the voyage from China to Vancouver than to San Francisco reduces the coal consumption immensely and freedom from port charges, so that on the whole "the blarsted Britisher" holds the winning card, and holding it, as I think he does, I am confident he has sense enough to play it to the best advantage.

The site of Vancouver is elevated ground and well adapted for health and activity. The place is new yet, scarcely four years old, and the present population about four thousand. I am told it is underlaid with a stratum of coal; certain it is, the pine and cedar stumps are not yet all removed from its streets. Real estate is yet low in Vancouver. It is well situated for trade and commerce, with immense natural resources behind it of timber, coal and iron, to say nothing of the mines of gold and silver in British Columbia. It must in a few years grow to be a city, large and prosperous.

After a stop of some two hours, we took the train for

Winnipeg,

Some 1400 miles to the eastward from Vancouver. The first 500 miles or thereabout is mountainous, and densely covered with a heavy growth of pine, fir and cedar, overlying immense beds of coal in some places. The mountains in places are very picturesque. On the highest peaks glaciers are seen from which numerous little streams of water were continually trickling down the mountain-sides.

After taking leave of the mountains, the railway traverses the great plains of Manitoba for 800 or 900 miles to and beyond Winnipeg. On this part of our journey there is but little worthy of note other than the continuous rich prairie soil traversed by the railway—a soil and a climate peculiarly adapted to the production of wheat. There are few settlements as yet commenced on these great plains. The winters are long and rigorous. Still such is the fertility of the soil and the general healthfulness of the climate that ere long these plains will be occupied by a hardy, vigorous, liberty-loving people. This whole vast region and the Dakotas and Minnesota can never become, beyond the production of a few berries, a fruit-producing country. West of the mountains of British Columbia, apples and plums, and perhaps cherries, may be grown, but peaches will not amount to much. I saw good, fair-looking apples in the gardens of Victoria.

On Wednesday, just one week after leaving San Francisco, we reached Winnipeg. And now of the Canadian Pacific railway. I regard it as among the best constructed roads on the continent. The trains move on it without jolt or jar. The coaches on the road are first class. Every ordinary coach has one end fitted up with lavatories and towels for the convenience of passengers, and also a separate room, into which passengers may retire to change and adjust their linen—conveniences for promoting the comfort of passengers that I have never seen provided on any of our American roads. The officers are polite and obliging. The company are restricted by law to 20 miles an hour, hence rapid time cannot be made on the road. This restriction, I am told, will expire in 1892, by which time it is thought the roadbed will become so solidified that rapid running of the cars will not injure it.

I will give further notes of our trip later.

Haywards. WM. C. BLACKWOOD.

Storm Winds.

A Student's Composition.

EDITORS PRESS:—Inject a spray of cold water or cold air into a cylinder filled with steam or watery vapor, and the result is a rapid condensation of the same. As a familiar illustration: Low-pressure engines are run upon this principle. The partial vacuum produced by the condensation causes the piston to plunge into the cylinder by atmospheric pressure.

The sudden or gradual condensation of moisture in the air operates in the same manner, and thunder-showers and storms, where great local condensation occurs, draw in air from all sides to fill the partial vacuum, and winds are the result. A great storm may start as a local shower caused by an uprising of warm, moist air into the higher cold regions of the atmosphere. The condensation creates a vacuum which draws upon the surrounding lower air charged with moisture, and also draws the cold air down at the same time. The action once set up, continues as long as warm, moist air and the upper cold air continue to pour in upon each other. The motion of storms is circular and toward the supply of warm air, and of course against the lower or warm, moist wind. And this condition continues till the moisture is mostly condensed in rain, or an equilibrium of temperature is brought about.

It sometimes happens that one storm follows upon the heel of another, causing a conflicting wind in certain localities. The cold wind felt right after the passage of a storm is drawn down and is following the storm and condensing the moisture drawn into the same from the warmer quarter.

No wonder there are terrific winds when the condensation is rapid over a large area of surface, for "nature abhors a vacuum," and it takes an immense deal of air to fill the void thus created. A single storm of but a few hundred miles in extent will draw upon the air and produce winds many hundreds of miles distant. But there is another principal cause of winds besides the vacuum produced by condensation. This is the primitive formation of vapor, and it acts with a *push*, while the condensation acts with a *pull*. This *push* wind may be observed locally about the Bay of San Francisco when the moist air pushes in through the Golden Gate and over the low hills thereabout. And it may happen, and often does, that the moist wind is pushed as well as pulled toward a storm at its inception, and this may account for an especially violent wind. The barometer shows the condition of the atmosphere in any special locality, and whether the wind is pushed or pulled. A vacuum lowers the mercury in the tube, while any extra pressure raises it above the normal level of atmospheric weight.

As to the cause of the expansion of the air and vapor, if it is heat or caloric, then must heat be a substance instead of a condition and enter chemically or mechanically into combination admixture with the air and water to produce vapor (at certain temperatures) and be set free or escape at a lower one; else why the expansion and contraction? Either this, or each particle or minute bubble of moisture must surround a vacuum, and when this breaks, air must replace it. This takes us into deep water, and philosophers must find out the truth, for there is evidently no truth past finding out which it is the province of the mind of man to come in contact with sooner or later.

The primal cause of all life and motion (winds included) on this earth is the sun, from which we get heat, light, electricity and the subtile somethings which impel the crudities of Nature into use for man's promotion and Nature's evolutions. The rising of heated air causes local drafts of wind, particularly near mountain ranges, and the falling of the cool air down the slopes of mountains at night may condense the moisture in valleys and aid local disturbances. But these are minor causes, although the rising of local warm, moist air up a mountain into the cold stratum may cause showers, winds and storms resulting.

The circular motion of storms, as well as the general direction of winds, are greatly influenced by the local formation of the mountain ranges, valleys, etc., as everybody knows. And many severe "atmospheric disturbances" at a long distance from storms may be traced to the distant vacuity drawing upon air currents set in motion by the expansion of vapor at some other distant quarter. S. H. H.

Los Gatos.

Lessons from Australian Planting.

EDITORS PRESS:—I have just received the report of the Forest Department of South Australia for the season of 1888 89. It is interesting to us in California as coming from a country of similar climate, of recent settlement, and otherwise reminding us of our own conditions.

Our tree-planting season now upon us makes it worth while to look into this report, because we can learn what trees are now most favored by the strongly established and long experienced forest department of South Australia.

One thing about these reports is rather unsatisfactory. It is that there is nothing in them to indicate the location or climate of any of the eight forest reserves and planting stations. The majority, however, are in the interior and have a small rainfall.

The season covered by the report was a dry one in Australia and unfavorable to tree planting. In spite of this the department set out nearly a million trees, distributed to private persons about 250,000 trees, and by protecting the forest reserves, from which the ripe timber had been cut from fire and sheep, secured a healthy natural growth of 1,100,000 trees.

A great variety of trees were planted, but only a few kinds in large numbers for economic purposes. All the varieties planted for returns had an established reputation from previous experiments, consequently these Australian plantings give California tree-growers a valuable lot of information.

The trees planted in Australia during the last season in quantities of 10,000 and over were as follows:

Eucalyptus Corynocalyx (Sugar gum)	291,067
" globulus (blue gum)	195,960
" Viminalis (Manna gum)	155,079
" rostrata, S. A. red gum	72,500
" leucoxylon, S. A. blue gum	30,049
" Gunnii (white swamp gum)	16,000
Pinus insignis, Monterey pine	23 533
" pinaster, cluster pine	10,225

Of the other eucalypti, there were planted of the

E. gomphocephala (Tooart gum)	5,338
E. cornuta, Yate	4 750
E. Stuartiana, Stuart	8,500

The large planting of sugar and manna gums justified themselves by their endurance of the dry season. All the other varieties showed a much lighter death rate than these. Of the 236,000 trees distributed, 109 154 were sugar gums, 17,038 blue gums, 47,566 Monterey pine, and the rest in small lots.

Of the 1,100,000 protected on the reserves, 1,000,000 were sugar gums, 60,000 red gums (E. rostrata), and 40,000 redbox (E. polyanthena).

These facts show us the opinion of the forest department of Australia as to the best trees to plant in that country, and also the trees that reproduce themselves by seeding when the ripe timber is cut. The blue gum, it will be noted, is not one of these.

Those persons who planted in our drier sections sugar gums, manna gums and Monterey pine on my advice when chairman of the California Board of Forestry, may now gather courage and confidence from these Australian figures.

One of the troubles tree-planters have to contend with here is the difficulty of obtaining seeds true to name. Thus it frequently happens that after we have studied the climate and soil of some particular situation, and picked out a tree for it, we purchase seed, plant the seedlings and find out in the end that it is not the tree we ordered. As soon as one goes off the beaten track of blue gum and Monterey cypress seed, certainty ceases except with the most reliable houses; consequently a tree-planter seeking new things should stick to the old reliables.

Recently I ordered quite a quantity of seed of the Eucalyptus rostrata (red gum) from a San Francisco seed firm. The seed on coming up proved to be Eucalyptus viminalis (manna gum). This is a very good tree, but the red gum seed was ordered for a special situation, and it is not a little to lose a year's time in planting with the cost of germinating and care of seeds, not to speak of the risk of having planted manna gums where red gums should go.

From the information at my command, I believe that there will be more trees planted in California this season than in any two previous ones. The missionary work of the foresters is commencing to tell, and we may hope that our annual devastating forest fires will soon be a thing of the past through an increased intelligence on forest affairs and an increased efficiency in the forest officers. ABBOT KINNEY.

Santa Monica, Nov. 29, '89.

[The selling of *viminalis* seed as red gum, instead of *rostrata*, is an old mistake of seedsmen, and it is time that it were done away.—EDS. PRESS]

American Capitalists and Mines.

EDITORS PRESS:—In your efforts in aiding the development of the natural resources of this coast, through the columns of the PRESS, and especially her mineral resources, do you not notice, and is it not singularly strange, that a large majority of our best and most productive mines seem to find their way readily into the hands of English capitalists? And is it not an *exception* rather than the rule, when *large* mining operations are undertaken by a co-operation of American capitalists? In most instances, if I mistake not, the American capitalist and *so-called* mining man thinks more of milking the public through some system of stock jobbery, than he does of legitimately working and developing a mine.

I cannot refrain from imposing on your crowded columns in expressing an opinion in the manner I do, because to me it seems a self-evident fact, the truth of which, to my mind, cannot be denied. The natural result is, that all new and important discoveries of mineral deposits on this coast seem to seek foreign capital in preference to home or American capital, from the fact as above stated, that there is no co-operation on the part of our mining capitalists in the legitimate development of the mineral wealth of this coast.

As an illustration, we learn of an English company being formed with $15,000,000 capital to work and develop the tin deposits in the Black Hills. We also hear of negotiations for extensive lead and silver mining properties in Alaska Territory by English capitalists. These properties have been known of and brought to the attention of our local capitalists and mining men for some years, yet the enterprise and spirit of industry for legitimate mining does not seem to strike our mining capitalists.

I will ask, Mr. Editor, if my views as above expressed are not correct, please let me have an expression of opinion from you on the subject, and by so doing a further discussion may be had and a comparison reached as to the amount of foreign and American capital actually invested in mining on this coast, and the relative value of the product from the two systems of management.

AMERICAN MINER.

San Francisco, Dec. 17, 1889.

JAMES CONCANNON of Livermore valley has signed a contract with the Mexican Government to deliver at El Paso 1,000,000 grape cuttings. They will be sent in carload lots, whence an agent will distribute them among the different States.

Lower Springs Mining District.

EDITORS PRESS:—This camp keeps up vigorous prospecting and some good ore is being discovered almost daily. The Gem mine, the most important property of the camp, is being developed in a most beneficial way. They are having the stopes fixed in good shape, preparatory to taking out ore for crushing, as they have an abundance of water for milling purposes. A few men are employed at the Hartman mine, running a tunnel to tap the ledge. The Kempton mill on Salt creek is running steady on ore from the district. The Ottawa Mill Co. is placing a Frisbee wet-crusher in its works, and will be able then to work all ores up to a good percentage. A San Francisco party has purchased a group of mines near Shasta, and they intend erecting a ten-stamp mill immediately after the storm abates. The roads are now in a very bad condition, and almost impassable.

It is conceded now by expert mining men that our mines are good and promise permanency. Individual mine-holders here and elsewhere have misrepresented their mining property in an ignorant and willful manner in order to bring men with capital in their midst, claiming that they have found at last a most wonderfully rich ledge, while the fact is it proves to be almost non-productive of the precious metal. All of these wild reports ought to come under the head of "Misdemeanor." Bogus reports and false pretense cause many failures in mining and milling, and most of these failures are really due to ignorance and rascality.

J. C. FRICK.

Lower Springs, Shasta Co., Cal

YOUR OWN PHOTOGRAPHER.—The latest fad is a nickel-in-the-slot photograph device in which the lens is so placed that it comes directly in front of the face of a person of ordinary hight. If the subject is too tall to get a reflection he can sit down on the screw-stool that is provided with each machine, and if too short he may attain the required elevation by mounting a pair of adjustable steps, which are also included in the patent. Back of the lens is the plate chamber, containing about 400 plates, on which the photographs are printed. After the person to be photographed has tickled the neck of the machine with the necessary quarter, he is required to pull a cord. Instantly the shutter in front of the lens opens automatically, and at the same time a flash of powder throws the necessary light on the face. The lens prints a likeness of the face on the first plate back of it. This is rolled over two small wheels to the bottom of the chamber, where it is taken by a pair of rubber tapes, which, in their turn, conduct the picture through the developing, fixing and washing fluids, and finally push it out of the machine a complete photograph. The likeness is made instantaneously, and the process is completed in less than two minutes.



CHARACTERISTIC VEGETATION OF ARID LANDS IN ARIZONA.

The Giant Cereus.

Our engraving herewith gives a good idea of the form of one of the chief features of the desert flora of the Pacific Coast, the giant cactus, or, as the botanists have named it, *Cereus giganteus*. A recent writer gives the following characterization of the family to which it belongs:

The *cacti* are plants having the central parts woody, around which are overlaid thick masses of cellular tissue; that is, made up of very small cells that connect with each other. The outside skin is tough and leathery, which enables the plant to retain its juice and to thrive on the rocks and barren places of tropical countries. The *cacti* grow in various forms and of different sizes, and are generally covered with bunches of hair and thorns instead of leaves. The tufts of hair show where the flowering buds originate, although but few of these develop. This family belongs almost entirely to the New World, and thriving, as it does, where scarcely anything else will grow, it seems as if it were a provision of nature for the support of men and animals who inhabit this region of country; for the fruit, as a general thing, is not only good for food, but is agreeable to the taste. Some of the *Opuntia* cactuses have become very generally distributed over some portions of Europe, particularly upon the shores of the Mediterranean and among the volcanoes of Italy.

The engraving gives the easily-recognized *Opuntia* or prickly pear on the right, but towering far above it is the giant cereus to which we wish to call special attention. One of the most interesting descriptions of it is given by John A. Spring in an article on "Arizona Flora" in the *Arizona Enterprise* of Nov. 23 1 as follows:

The valleys, sandy plains, mesa lands and sunny mountain-sides of Central, and especially Southern Arizona, are covered by innumerable species of the Cactaceæ, among which the most conspicuous is the giant cactus (Cereus giganteus). It attains its greatest hight on dry, sandy lowlands, where quite a number of them have been found to attain from 50 to 54, and a few even to 60 feet by actual measurement. When well proportioned they look like the tall, majestic fluted columns of the temples of the ancients, and again when surrounded by branches arranged in a circle around the mother-trunk, they resemble a gigantic candelabra. The ridges from top to bottom are covered by thorns which contain a resinous substance, so that by applying a lighted match to the bottom of the plant the entire cactus will in a few seconds become a pillar of fire. The Apaches have, to my knowledge, quite frequently made use of this circumstance in their warfare to exchange signals by night from one war party to another. When, by reason of old age, lightning or other causes, the outer pulp of the cereus begins to peel off and decay, there appears below a skeleton of long poles held together by the fibers of the plant, forming a circle around the circumference about two inches inside of the outer skin. These poles, when dry, are separated (their weight is exceedingly light) and are used by the natives in their roofing, forming a layer upon the rafters which receives the mud and dirt, of which the roof proper consists. The mass of the cereus, as of all other cacti, is a whitish pulp, which has not, to my knowledge, been put to any use as yet, but I have every reason to believe that ere long the pulp of all the bulky cacti will find its utility in the manufacture of paper, while the fibers of some will be extensively employed in other industries. The flower of the cereus, which generally stands in a ring around the top or near the tops of the mother trunk or branches, is of a creamy color and very beautiful, though odorless. The fruit, which is nearly egg-shaped, contains a very palatable pulp of, when ripe, a dark purple, and in it are imbedded thousands of tiny black seeds highly prized by all the feathered tribes. The Indians cook this pulp into preserves which they keep and peddle about in earthen jars of their own manufacture.

The picture also gives intimation of the character of some of the low-growing shrubbery of the desert and of the arid landscape stretching to the distant mountains. The group of Indians in the foreground must, however, be acknowledged to be somewhat idealized, as is the wont with artists who delight in giving the Aborigines rather more nobility and picturesqueness than they can justly claim.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SUTTER CREEK.—Cor. Amador *Ledger*, Dec. 14: Operations at the Lincoln have come to a standstill for some time, owing to the heavy rains. Ore was taken out of a tunnel. This tunnel is full of water to the mouth, and the tools left therein are under water. There seems to be no other way to drain the tunnel except to bail the water out, and this will take time, besides being a very disagreeable task. As soon as the rain ceases Mr. Stewart will put everything in running order again. At the Sutter Creek mine they are running a crosscut to tap a vein with ore above, and the mill has stopped temporarily in consequence. Several gravel claims are running full blast about five miles above here, which are said to be paying well. The heavy rains have given them plenty of water to work ground they never could get at before.

HARDENBURG.—It is reported that Hayward and Hobart are interested in operations at the Hardenburg mine, at Middle Bar. A short bond of the property has been secured, for the purpose of cleaning out the shaft and ascertaining whether the condition of affairs at the bottom as regards size and quality of the rock is as reported; and if found to be as represented a large amount of money will be expended in its development. Little has been done so far, as the roads are in such a condition as to render the hauling of material to repair the shaft next to impossible.

AMADOR GOLD MINE.—The rock-crusher for the Amador mine arrived at the Ione depot last week. The largest piece weighs 12,000 pounds. In the present condition of the roads it is impracticable to haul such an immense weight. The weight of this one piece is twice as much as the teamsters have been hauling of late. It is likely that the machinery will have to remain at Ione until the weather improves, and the roads dry up somewhat.

KENNEDY.—It is expected that the mill will be started the last of the present week. Only a portion of the stamps will be started at first, but will drop more stamps as the new ground is opened up until the 40 stamps are at work pounding out the precious metal. The new level at the depth of 1150 feet looks encouraging, with every indication of a strong ledge at a greater depth. The rock is of a good quality, and is estimated to mill better than the average of ore from this mine. An idea has prevailed in some quarters that the Kennedy is a mere surface mine, but the developments all tend to dissipate this notion.

MISCELLANEOUS.—It is reported that two parties from below, Edwards and Irons, have leased or bought the Cluff ranch near Pine Grove, and intend taking out a crushing from one of the ledges, and test the same through the Dane mill, after the mill has been repaired. H. D. Emerson commenced crushing on 125 tons of ore at his mill, at Pine Grove.

Calaveras.

A GOOD MINE.—*Prospect*, Dec. 12: The Plymouth Rock mine, situated on the Calaveras river, near Jenny Lind, has proved to be a valuable piece of property in the last two months. The mine has lain idle for years because the parties that owned it failed to procure the proper facilities for working the ore. Quite recently the property changed hands and Capt. Eby and C. E. Philes, both practical mining and milling men, took charge of the mine, and under their able management it has paid handsomely from the start. The mine is very easily worked—quarried out—and a very large amount of it is free gold that assays well. There is a Huntington crusher with a capacity of 20 tons in 24 hours running night and day on the mine. We were informed by Mr. Philes they were going to increase their crushing power so they can handle 100 tons of ore in 24 hours. The mine is an immense one, and to a casual observer it looks as if there was rock enough in sight to run a crusher for 10 years.

THE ANGELS MINE. — Angels *Record*, Dec. 12: Mining is largely increasing in and around Angels and the present stimulus arises from the positive character of the ore bodies together with their magnitude and increased valuation. Leading the van in this particular is the Angels mine, Geo. Fox superintendent. The exploitation work still goes on, and the leads under process of development are becoming larger and more valuable. On the 400-foot level of the Angels mine one of the lodes is over 20 feet in thickness and still widening. This and similar results have added much to the already abundant satisfaction of the management, which is largely attested in the erection of a splendid 40-stamp quartz-mill, the timbers of which are already on the ground. The chlorination works are to be erected in close proximity to the mill, thus greatly expediting manual and mechanical labor. Mr. Buckminster has charge of the entire plant and has furnished the designs.

SHEEP RANCH.—The Sheep Ranch mine is fast increasing in water at the lower levels, and it will be no surprise to soon hear that operations are suspended owing to the great surplus. The water cannot now be manipulated as it formerly was, as the shaft has attained a great depth and the machinery is wholly inadequate to keep up the severe strain of days of continual rapid and heavy hoisting. Supt. Cleary informed your reporter that he feared that the mine might have to be shut down if the storm continued. There will be dull days for our villagers if this proves to be true.

GOOD YIELD.—*Mountain Echo*, Dec. 12: Some weeks ago, Otto Dolling of this town sent to the Selby Smelting works 786 pounds of ore, taken from his mine near Albany Flat, the returns from which were received the other day. The yield, though not so high as anticipated by many who examined the ore, is yet sufficiently rich to justify an outlay of many thousand dollars toward the more thorough development of the mine. The yield is as follows: Gold per ton, $222.50; silver, $8.50. The shaft on this mine is only a little over 20 feet deep and the vein is nearly four feet in width.

El Dorado.

KELLEY MINES.—Georgetown *Gazette*, Dec. 12: Three new Huntington mills have been ordered for the Kelley mine at Kelsey. Mr. Pearson and his company mean business, and as soon as their electric plant is in position active operations will begin.

SLUICING.—Many of our miners are busy sluicing, and we anticipate some rich cleanups.

QUARTZ.—Placerville *Observer*, Dec. 14: Dr. W. W. Stone has make a quartz discovery on his lead, near Steele's, ranch that promises to be of importance. The ledge, so far as developed, is two feet wide and prospects for high-grade ore. The doctor is now prospecting to ascertain the length of the ore chute, which he thinks is 500 feet.

GREENWOOD.—Mining news is very encouraging in the vicinity of Greenwood. Reports are coming in every day of mines being opened and large forces being put on those that are now running.

QUITE A STRIKE has been made lately in the Bassett mine at Weaver Hill, in blue cement gravel. One man while prospecting in a new drift just started panned out as high as $13 a day. The gravel seems to hold out about the same as the drift progresses. This old mine has paid enormously rich in early days, and there is a large amount of ground yet untouched, only the front rim having been worked.

Fresno.

TO THE MINARETS.—Fresno *Expositor*, Dec. 11: For seven years C. S. Beck has spent his time and a great deal of money in an effort to develop mining property in the region of the Minarets. He is the owner of a large number of mines in that section which have proven rich in gold and silver. For many years prospectors who have traversed the mountains near Minaret peaks have reported that they were pregnant with minerals. A large number of claims have been taken up by gentlemen from Fresno who have been waiting for something to "turn up" in order that they might be able to get the products of their mines to the market. The Minarets are located just 73 miles north from the courthouse of this city. There is no portion of the Sierras so inaccessible. For years it was almost impossible to lead a pack mule nearer than six miles of the iron mountain on the southern slope of the Minarets. About six months ago Mr. Beck, knowing the richness thereof, placed a large number of specimens of ore on exhibition at the Bureau of Mineralogy at Chicago. This was a means which brought Mr. Beck in communication with several capitalists of that city. Mr. Beck wrote in detail telling the Chicago men how inaccessible the mines were to any railroad, and the great advantages of a line to the Minarets. They were finally prevailed upon to send an expert to report upon the mines. On last Saturday, Mr. Beck came down from the mines, and received a letter from the Chicago man stating that his proposition had been accepted, and a party would be sent out at once to survey the proposed line of the road, which will commence at the iron mountain on the southern slope of the Minarets and extend to Fresno.

Kern.

AT HAVILAH.—Inyo *Independent*, Dec. 14: It is reported that a rich vein of ore has been found at Havilah. Two tons of the ore were sent to San Francisco, and after all expenses were paid left a profit of $700. Havilah was at one time a very prosperous camp, but for a few years past not much was done there. The recent find gives promise of more prosperous days than ever for the place.

Mariposa.

THE CHAMPION MINE.—*News*, Dec. 14: The preliminary work that has been done on this mine during the past six months more than justifies the expectations of the Chicago Co., that own part of it and represented here by Col. Dunbar and Mr. Hay. Free gold has been taken out of the different levels and the assays of rock showing no free gold are very good. Messrs. Hay, Dunbar and Ridgway are fully satisfied that they have a good mine, and are in favor of putting up a mill at once. They will possibly put in about five stamps at first and increase the number as the mine develops.

Nevada.

GRAVEL MINING WORKS.—Grass Valley *Union*, Dec. 15: Work on the gravel mining works at Mooney Flat has been suspended for several weeks on account of the unfavorable weather, but Orlando Stoddard, who is doing the work, will go down early in the week to resume operations. When the works are completed, the gravel, which is raised through a shaft, will be handled with much greater facility than heretofore, and with more profit to the owners. The gallows-frame will be 40 feet in hight, which will give better opportunity for dumping, as the plant is situated on level ground, and more of the work done by machinery than heretofore. The new structure will contain four arastras for washing the gravel.

MORE WATER THAN DESIRED.—The ground is full of water from the long-continued rains, and is giving the machinery of several of our local mines about all the work it can do to keep the water in control, and were it not that several of them have drain tunnels that carry off a large amount of surface water, by this time the lower levels of several of them would have been drowned. When it is considered that over 31 inches of rain has fallen in less than two months it will be understood that the mining pumps have had to do extraordinary work by being run at a much higher speed than usual.

Placer.

THE BRYAN MILL. — Placer *Herald*, Dec. 14: Theodore Kuply, superintendent of the Horman mine, Iowa City, writes as follows: I notice a statement in your paper that it is rumored that stamps will be used on the Horman mine as the Bryan mill does not work satisfactorily. This is a mistake. We are running two Bryan mills with a capacity of 20 stamps—power to run them, that of 10 stamps—and saving nearly all the gold in the mills and on the aprons. The sluices below the mill do not pay for the time it takes to clean up. Columbus Waterhouse, principal owner, was here a few days ago and is highly pleased with the mills, and says they are by far the best mill in use.

OPHIR.—*Argus*, Dec. 10: There hasn't been a season for years that looked so favorable for our mining industries as the present. At Ophir there is hardly a mine, old or newly developed, that is not yielding, or being placed in a condition to become a live property for its owners. The Hathaway mine with its new machinery is settling down to a steady paying mine, and great expectations are entertained of its future. The Eclipse mine, under the skillful management of Patterson & Erwin, is being thrown into shape for thorough development, and its good previous record will be eclipsed by its present management. A. Shurtleff keeps at work on the old St. Patrick and Doeg, and assures us that they pay. The fabulous richness of the Doeg in the past is prospectively soon to be repeated by the diligent work of Shurtleff and his assistants. Mr. B. F. Hartley has his Huntington roller in place on the Almond mine, and hopes shortly to commence work at the Three Stars.

IOWA HILL.—At Iowa Hill the outlook is the best for years. The Drummond mine on Owl creek, now owned by Hon. C. F. Reed, is proving rich. Mr. Reed finding that one Huntington roller with a capacity of 20 tons was not enough, is now putting up another to double the capacity. Specimens shown from there are fabulously rich. The Horman mine, now in the hands of Mr. Waterhouse, of the firm of Waterhouse & Lester, is being worked systematically and to profit. The Morning Star mine, lately bonded from the original owners, is maintaining its reputation for good pay. The Mountain Gate mine at Damascus, lately bonded by the Golden River Mining Co., is in good hands. The company have the means, and will either put in pumping machinery for drainage, or if justified, tap the channel with a new tunnel that will afford drainage for the entire mine. There is still enough of the old channel to justify an extended outlay, but the original stock-owners were not in a condition to do this. The Red Point gravel mine, under the control of Chas. F. Hoffman, with A. J. Snyder as assistant, is the property of the Golden River M. Co., and may safely be said to be one of the best mines in the State. When the branch tunnel, just completed, was begun, the mine was paying splendid dividends. The branch tunnel was completed to work the mine at better advantage and furnish a larger surface for breasting. They are now ready to resume washing, and to work on a much larger and more profitable scale. At the Hogsback mine the new tunnel is being pushed forward with all possible rapidity, and early in the opening year we may expect that the channel will be reached, and the mine become bullion-bearing. For steady product and systematic working the Hidden Treasure mine at Sunny South is one of the best. With Harold T. Power at the head, we may expect a continuance of its admirable record.

FOREST HILL.—The November product of the Mayflower mine was $34,000, making a yield of $330,000 from Dec. 11, 1888, to Dec. 10, 1889. Mr. Chappellet is still acting as superintendent, though the company gave him a Mr. Beach as assistant. The mine is perhaps, all things considered, the best equipped in the State. The Breece & Wheeler mine at Bath was never paying better than at present—it has always paid. There have been intervals when this mine has been slacked up to open new ground, but when open the gravel has been very generally of a uniform richness, and the yield has been princely. The two partners are both residing in San Francisco, in affluent circumstances. W. H. Grinnell has charge of the mine at present. The Live Oak mine, near the Mayflower, is so situated that during the process of its development the gravel may be worked at the Mayflower mill. It will no doubt become remunerative in time, as it is in a rich district with plenty of channel gravel ahead. The Gray Eagle mine near Butcher ranch is being reached by a tunnel, placed low enough for drainage, and their gravel, which was reached by a shaft, has every indication of being excellent. The Dam claim above Hidden Treasure, the Hermit mine of A. C. Bowen & Son, Dr. Schnabel's mine at Last Chance, and other old-time and steady-paying mines, both there and at Deadwood, will be mentioned hereafter. Near Danetown is the famous Whisky Diggings copper mine. This mine must have a great future. Native copper ore and copper in solution is produced. The Purdy Bros. expect to induce a syndicate of capitalists to take hold of this mine, and as the native ore is so abundant and of such a straight percentage of the pure article, it must prove a profitable investment. Enough is now known to prove that the Forest Hill divide, with the main Damascus channel and the lateral drifts, is by odds the richest in the State, and that for years to come the precious metals will continue with an increasing volume to pour in from our great drift mines.

San Bernardino.

TO OPEN THE CLAIMS.—Los Angeles *Herald*, Dec. 12: Some time ago an article was published in the *Herald*, describing a number of mineral ledges that had been discovered in San Bernardino county. They were located about 40 miles below the Needles, on the Colorado river, and the specimens brought to the city at that time were pronounced to be very good. The owners of the ledges received a number of offers for interests in their claims, but these were refused, and a few weeks ago Mr. Liddell and Mr. Hoey started for the Colorado with the intention of opening the ledges, preparatory to working them. A letter was received last week from them stating that they had tunneled 25 feet into the Attica claim and that the vein widened as they proceeded. Where the tunnel started the vein bearing free gold was only about six inches wide, but 25 feet from the surface it had widened to two feet and six inches, and appeared to grow richer. The vein is visible for a distance of nearly 600 feet on the bank of the river, and it is estimated that it will produce enough to keep a smelter going continuously. The owners of the several mines in this group will ship a concentrator to the spot early in the spring. So far none of the ore taken out assays less than $100 per ton.

Siskiyou.

RIVER MINES.—Yreka *Journal*, Dec. 11: The heavy rainstorms lately have caused high freshets in the Klamath river at and below Oak bar, obliging most of the miners to pull out their machinery for the season. There are probably not more than one or two companies now at work. All have had poorer luck this season than usual, owing to disastrous cloud-bursts during mid-summer, and earlier and heavier rainstorms prior to December. Still they have realized more than expenses, some undoubtedly taking out considerable dust.

QUARTZ.—Spencer & Co., of the Good Enough quartz mine on Humbug creek, are down in their shaft nearly 100 feet where the ledge is three feet wide and pays about $100 to the ton. This ledge has paid handsomely from the surface down, and gives every indication of being a permanent ledge that will average $100 a ton for all quartz taken out.

GRAVEL.—A correspondent of the Ashland *Record* says W. H. Smith at Cottonwood creek in this county is at present piping off about 40 feet of pipe clay and adobe mud. He has uncovered from four to five feet of fine blue gravel, and it prospects splendidly. He is undoubtedly located on the old blue lead that traverses this county from north to south, and he is working on the east rim.

HYDRAULIC.—The miners of Oro Fino, Quartz valley, Pinery, Patterson, Indian, McAdams, Cherry and Deadwood creeks feel jubilant over the great amount of rainfall lately, and more particularly the snowfall on the mountains, which will enable them to prosecute mining more extensively than they have been able to do for a number of years past. The hydraulic miners will soon start up work with their giants, and parties holding claims in the dry gulches and ravines will have sufficient free water to begin ground-sluicing this week, if the weather continues cloudy and warm as at present.

GRAVEL.—Yreka *Journal*, Dec. 18: The miners at Spring, Humbug, Portuguese and Greenhorn gulches, west of town, are all getting ready for washing gravel soon, in view of running water from the great amount of snowfall on the Humbug range during past ten days.

QUARTZ.—Parties engaged in prospecting quartz ledges on Spring, Portuguese and Humbug gulches in the hills, on west side of Yreka, are meeting with good success, and will soon have considerable quartz on hand for crushing at the Warren quartz-mill on Yreka Flats. The late rains caused a freshet in the Klamath river of sufficient extent to flood all the claims and oblige a suspension of river-mining until next spring. The miners cannot complain about lack of snow in the mountains this winter, as there is an average supply already, with the winter season hardly commenced, at least, during most winters, our heaviest storms seldom commencing before the middle of December.

Trinity.

CANYON CREEK. — *Journal*, Dec. 14: "Nix" writing from Canyon Creek, under date of Dec. 1, says: "The quartz mines of this district have made a small start. The Grigsby & Shock arastra is completed and running at the present time with good prospects for a successful run which will cause others to follow suit. The hydraulic claims on the creek are running, except Bartlett & Taylor, who, after two days' run, met with quite a loss by a slide coming in their ditch which will take a week to repair."

Tuolumne.

NEW MACHINERY.—Sonora *Democrat*, Dec. 14: This week there passed through town a big smokestack for the large new boiler now being put in place on the Hyde mine, and a quantity of air and water pipes. At the Sonora foundry a new V gearing has been ordered for the hoisting works, much larger than the one now in use. This mine will soon be equipped with a powerful plant for extensive work.

NOTES.—*Independent*, Dec. 11: The Tibbits mine, above Columbia, has every indication of immense wealth. The Kelly-Munn mine has been shut down during the week on account of too much water. The Dead Horse mine at Summersville is prospering, and employing about 35 men. The Dutch mine at Quartz mountain continues to improve, and the work of development goes rapidly on. The new hoisting works on the Stockton mine are now in working condition, and the work of sinking the shaft commenced. The Golden Gate mine is slowly but surely increasing its force of men, and now has about 20 names on the pay-roll. The New Albany mine, owing to inclement weather, is making headway slowly but surely, with about 15 employes. John Stevenson, lessee of the Smith mine, is at work in the old tunnel where E. J. Richards, deceased, years ago worked and got $20,000. The Buchanan has virtually closed down for the winter, only eight miners being employed, and 12 men all told on the works. The Black Oak is still inoperative, and the men not yet paid. Supt. Scott is in St. Louis attending a meeting of the Board of Directors. Work on the Bonanza shaft is progressing slowly, the ground being very hard. The contractors are getting $13 per foot, and at that price will have to work hard to make wages.

NEVADA.

Washoe District.

SEG. BELCHER. — Virginia *Enterprise*, Dec. 14: The winze down from the 1200 level has connected with the raise from the 1300 level. This gives a good circulation of air and will greatly facilitate operations.

NORTHWESTERN.—The main shaft of the Northwestern mine, near the Utah, is down 54 feet in soft vein matter.

YELLOW JACKET.—The usual amount of ore, assaying $21 a ton, is extracted and shipped.

ALPHA.—Drifting from the 600 level shaft station. The 500 level west crosscut continues in quartz and clay.

EXCHEQUER.—The 382 level east crosscut is still in vein matter and the 500 level north line west crosscut continues in quartz.

WARD COMBINATION SHAFT. — The 1800 level west drift is advanced 81 feet.

OVERMAN.—Shipped 234 tons of ore to the Vivian mill during the week.

CROWN POINT.—Have started a drift on the 600 level, seventh floor, to connect with 600 level old stopes. Are out 38 feet in porphyry and low-grade quartz. Are opening the 300 level south stopes on the fifth floor, which looks well. Shipped to the mill during the week 1778 tons of ore, the average battery sample of which was $16.58 per ton. The yield of bullion for November was valued at $33,939.60.

BELCHER.—Are running exploring drifts on the 200, 850, 1000 and 1200 levels. In all the drifts vein material is found that carries more or less metal.

CHALLENGE CON.—The west crosscut on the 300 level is passing into low-grade quartz. On the 800 level good progress is making.

CON. IMPERIAL.—The usual prospecting operations are in progress on the 300 and 500 levels, and the drifts are showing much vein material and low-grade quartz.

ALTA.—Are crushing over 300 tons of ore a week, the average assay of which is $25 a ton.

JUSTICE.—Are reducing about 300 tons a week; average assay, $28. The ore-producing sections of the mine are looking well.

CALEDONIA. — South drift is extended a total length of 313 feet. No change in the formation.

SAVAGE.—Are crushing at the Rock Point mil

about 400 tons a week, the average assay of which is $25 a ton. Bullion on hand, $7632.40. The mine continues to look well, and are extracting ore from the 400, 500 and 750 levels.

NEW YORK CON.—The raise above the 800 level west crosscut continues in fair-grade quartz.

BEST AND BELCHER.—The usual progress is making in the exploring drifts on the 625 and 1000 levels. There is no change of formation worthy of note.

POTOSI.—The 800 level drift is still stripping low-grade quartz.

HALE AND NORCROSS.—The usual amount of ore is being reduced at the Nevada mill. The average of the battery assay is about $25. Bullion on hand, $21,500.

CHOLLAR.—The usual amount of ore is being extracted and reduced at the Nevada mill. On the 500 level quartz is being found that carries some metal.

SILVER HILL.—Usual progress made in the 160 and 260 level explorations, without any change in formation.

GOULD AND CURRY.—The usual work is doing in the drifts on the 200 and 400 levels. The formation on both levels is a mixture of quartz and porphyry carrying some metal.

CON. CALIFORNIA AND VIRGINIA.—From the stopes on the 1300, 1435, 1500, 1600 and 1650 levels continue to extract ore sufficient to supply the Morgan and Eureka mills. Ore is showing at several points in the prospecting drifts on the 1650 level, and from some of these material is being extracted for reduction. The average of the pulp assays will be about the same as last week.

UTAH.—The southeast drift on the 600 level continues to show clay and porphyry in the face and is somewhat wet.

OCCIDENTAL CON.—Work has been temporarily discontinued, pending a run on ore from the North Occidental.

NORTH OCCIDENTAL.—Extracting ore from the 300 and 400 levels.

HENDRICKS.—Repairs to the shaft timbering in progress.

SIERRA NEVADA.—The east drift from the south drift run from the main east drift is being advanced in a mixture of clay and porphyry.

UNION CON.—West crosscut No. 3 on the 1465 level is in a vein porphyry that shows slips and seams of clay.

MEXICAN.—West crosscut on 1465 level is still in a mixture of quartz, clay and porphyry. The ground presents a promising appearance.

OPHIR.—The south drift on the 1300 level is making good progress and is passing through a formation composed of porphyry and quartz.

Comet District.

PROSPECTING THE MINES.—Pioche *Record*, Dec. 7: E. A. Shear came in from Salt Lake last Tuesday accompanied by J. H. Mitchell, whom he brought down to inspect the mines at Comet district which he has under bond. Mr. Mitchell returned on yesterday's stage. Mr. Shear remains with us, and will soon begin development work at Comet.

Eureka District.

FOR TRIBUTE.—Eureka *Sentinel*, Dec. 14: The men who have been thrown out of employment by the closing down of the Richmond reduction works talk of going to mining, and will look for tribute pitches in some of the mines.

AT MINERAL HILL.—It is reported that Joe Flynn has struck a big bonanza at Mineral Hill of a ledge ten feet thick, assaying $65 per ton. This is the year of big bonanzas evidently, as we are hearing of big strikes now all over the country. If silver comes up we will have a great boom in mining.

Tuscarora District.

ELKO CON.—*Times-Review*, Dec. 13: The crosscut at the foot of the incline has been extended 4 feet.

DIANA.—The south drift from the east crosscut, 300-foot level North Belle Isle, has been extended 16 feet in low-grade ore.

NEVADA QUEEN.—South drift from joint crosscut has been extended 19 feet, showing some good ore in the face, having improved since starting work.

GRAND PRIZE.—Winze in the south 400 drift sunk 14 feet, showing a good-sized vein of concentrating ore.

BELLE ISLE.—South drift from west crosscut, 250-foot level, extended 18 feet, the face looking more favorable.

NAVAJO.—Work in the mine has been confined to the stopes above the 150-foot level, which are looking fair. The tubes have been removed from the north boiler and a new set is being put in.

NORTH BELLE ISLE.—The crosscut from the 300-foot station extended 27 feet, face looking favorable. The stopes near the Queen line, same level, are looking fair. Coucentrator running as usual.

DEL MONTE.—100-foot level: No. 2 east crosscut has been advanced 20 feet. Have started cutting out station for second level. 225-level: East crosscut from north drift has been extended 5 feet, in favorable looking rock. Joint crosscut has been advanced 7 feet, cutting into good ore.

NORTH COMMONWEALTH.—A station is being opened from which to develop the second level. Joint crosscut has been extended 7 feet, the whole face being in ore, some of which is high grade, assaying $397 per ton. Some water coming through the face.

COMMONWEALTH.—100-foot level: No. 1 east crosscut extended 20 feet in vein formation, showing bunches of ore. An upraise has been started from No. 1 west crosscut up 10 ft. through spar. No. 3 upraise, following the ore, is up 20 feet, exposing high-grade ore all the way. South, intermediate from No. 4 chute extended 15 feet and is opening a fine stope of ore. No. 5 upraise from near the face of north drift, has been extended up 12 feet. There have been 435 tons of ore worked at the concentrating plant; battery assay, $19.82 per ton; average assay of the concentrates, $301.08 per ton. All first-class hoisted is being run into the mill.

ARIZONA.

BLACK HORSE.—Prescott *Journal-Miner*, Dec. 11: Mr. David Boaz has just closed a trade for the Black Horse mine, eight miles from Prescott, on the Peck road. The mine is situated half-way between the Kansas City M. & M. Co. property (Groom creek) and the Senator mines, which were recently purchased by Phelps, Dodge & Co. Mr. Boaz has forwarded articles of incorporation to Kansas City, Kansas, to be signed by N. Mc Alpine and others who are interested with him in this property. This mine has produced some very rich ore. There is a shaft down 60 feet. Mr. Boaz has now on the ground a new steam hoist, which will be ready to start up in three or four days. This is the fifth mining company organized and put in operation by Mr. Boaz in this county in the last 18 months. The Dixie mill, which has been idle for want of water, will be started up again in a few days. Supt. Helm, of the Oro Bella Co., has gone to the Bradshaws to start up that company's mill, which has been lying idle for several months for want of water. The new pump for the Hackberry Co. has been delayed for some cause or other, but is expected soon. The new owners of the Senator will start the pump up shortly and pump the water from the mine, and probably do some other work on the property during the winter.

PLACERS.—Placer miners have commenced washing gravel in Copper basin, where there is said to be some very rich ground. Preparations were completed some time since and the owners of claims have been waiting patiently for water, of which they now have an abundance.

NOTES.—The incessant rain and muddy roads have caused a very perceptible falling off in the quantity of ore arriving from the mountains, but milmen are rejoicing over the rainfall, which is already ample to furnish water during the entire winter. The Lynx creek hydraulic works have been started up with a full head of water, having previously been put in first-class shape for a successful run. Chas. A. Girdler brought in a big bar of gold bullion from the Etta mill yesterday. He was having a very successful run when he was knocked out by the flood. Twelve thousand pounds of ore were received at the sampling works yesterday, from Turkey creek and Lynx creek. H. N. Palmer and Jack Martin have bought two-thirds interest in Alex. Goodfellow's Highland Mary mine, located about six miles from the Congress, and will commence to work it at once. The ore is gold sulphurets, assaying as high as $300 per ton. H. C. McDonald and Joe Mayer have filed the location notice of the "Self Cocker" mining claim, in Big Bug district.

NEW FIND.—Mohave *Miner*, Dec. 14: Thos. Woods is highly elated over his new find in the Wallapai mountains. As work progresses the ore increases, and as the quality is high grade, Tom has a right to smile and look pleasant.

CUPEL.—The recent strike in the Cupel still holds out wonderfully, and it shows every indication of a continuous vein. Supt. Mackenzie has 20 men at work and is prospecting the mine with the hope of making other discoveries. The differences heretofore existing between the stockholders of what is known here as the Gold Mining Co. of Washington, D. C., have been settled, and it is said that they will commence operations in a few months. J. B. Shipman, of Washington, has been here several weeks, and W. F. Grounds was in Kingman last Saturday and made the final arrangements of the settlement.

BISBEE.—Cor. Florence *Enterprise*, Dec. 16: Some 40 miles from Fairbank is the town of Bisbee, where is located the well-known Copper Queen. The property is owned by five gentlemen in the East, who operate it in a practical manner. Very little is known on the outside about the output of bullion. A visit to the mine and smelters shows that an increase of power is to be added in the way of engines and other machinery, showing that this property is growing in value as the mines are opened up. The capacity of the smelters is about 300 tons per day, and, at a rough estimate, they turn out about 35,000 to 40,000 pounds of bullion every 24 hours. Large quantities of it were piled up waiting shipment, which, owing to the scarcity of cars, had to lie there. Everything in connection with the mine shows that there is a master hand at the wheel. It does not take an expert to observe the regularity and smoothness with which every branch is operated. It is said that over 300 men are employed here. Twenty-four cords of wood are consumed daily at a cost of $6 a cord. Most of the wood comes from the Chiricahua side. The timber, similar to that of the King, is supplied from the Chiricahuas. A sawmill is kept steadily at work supplying the mine and settlements. The lagging comes from the Huachucas and is hauled by teams.

DAKOTA.

MARIPOSA AND BOSCA BOY.—Deadwood *Pioneer*, Dec. 14: Henry Lundt and Louis Toney have an excellent quality of ore good enough to ship exposed in three different tunnels on the Mariposa and Bosca Boy claims. The boys are working the property steadily and are confident of great things.

UNCLE SAM BULLION.—Bullion from the Uncle Sam mine, secured from cleanup at the mill for November's run, was brought in Wednesday and went East by express yesterday. The brick was valued at very nearly $20,000.

CORA.—Report is current that a good body of high-grade galena ore was struck in the 400-foot tunnel on the Cora mine day before yesterday. The mine is at present under the superintendency of Alex Huyett, who is working quite a force of men. One ton of ore taken from the newly discovered body gave an assay return of $85.

RUBY BASIN.—It is reported that the Hartford M. Co., which has just completed assessment work in driving a 30-foot tunnel, will levy another assessment shortly and continue work on their tunnel. Dick Richards is reported as having formed a company in Rapid City on his South Ruby mining claims. The group is of some magnitude, and work this summer exhibited some good ore.

STRUCK SHIPPING ORE.—Geo. Inman, working property adjoining the Equitable at Bald mountain, has struck a large body of excellent ore. A quantity has already been taken out and will be shipped to Omaha.

IRON HILL.—The Iron Hill smeltery blows in again to-day, but whether for a run on lead ore as previously stated, or on dry ores from Bald mountain, using pyrites for flux, is a very vexed question which will probably be settled only when the blast commences. The company has been hauling ore from the Double Standard, Harmony, Calumet and John Delaney's mine, the Granite Mountain, situated on Squaw creek.

BOUGHT SOME ORE.—The Golden Reward M. Co. yesterday sold 100 tons of ore to the Syndicate smeltery, and gave the latter institution option for 1000 additional tons. Eight dollars per ton was the price paid for that sold yesterday and to be paid for the greater quantity if taken by the smelting company. This is just about what the ore would net the Golden Reward if shipped to Omaha or Kansas City. The smelting company takes its purchase from the dump at reduction works, where some 2400 of the 3500 tons hauled down last fall and winter still remains.

COLORADO.

AN UNEQUALED RECORD.—There has been only one mine in the long history of mining in Clear Creek county that has never closed down from the day of its location stake to the present time—and that is the famous Pay Rock mine, with its record of $1,800,000. All other mines where opened, yielded fabulously, were sold to corporations, extravagantly managed, run in debt, finally sold out and again resumed operations under business management. Not so with the Pay Rock. It was a bonanza from the first blow of the pick—from grass roots to its present depths. During all the extravagant times of its management, the famous Silver Bank and Pay Rock levels put forth such a stream of riches that it not only developed the mine, but it paid ruinous interest on an ill-advised issue of bonds, paid enormous salaries to a president, vice-president, secretary, treasurer and full contingent of ornamental officers, and yet under the quarrelings and bickerings and cross purposes of the management, the magnificent property put out so continuously of its ores that never in the whole course of 18 years has its workings been closed. And now that the present management have spent $250,000 in betterments and manage it with such economy that the saving of a few cents in mine cost per ton is an object, the mine will put forth its riches unabated. The present company has spent in Georgetown and Silver Plume for labor alone $85,000 and $20,000 paid out for supplies, while it has brought in and erected over $40,000 worth of machinery, all within the last two years. That is a management that is worthy of the mine,

IDAHO.

SMELTER AT MINERAL.—Idaho *World*, Dec. 7: The porphyrite smelter at Mineral City started up a short time ago, and, with the exception of a short stoppage rendered necessary by repairs to the apparatus, has run continuously since with great success. The extraction of silver and gold is most complete. This is the first matting furnace ever introduced in the Pacific Northwest, and as far as results go proves equal at least to the ordinary lead smelting process, and in its adaptability to the conditions of mining in the Northwest, is infinitely superior to a dry lead smelting plant, however extensive. The works have a capacity of 30 tons per day, and can be easily and quickly enlarged to twice that amount. It is highly probable that such an increase in the capacity will soon be made for the quantity of ore now in sight in the Porphyrite Co.'s mines. They struck recently, in the Black Maria mine, four feet of solid galena ore, samples of which run as high as 500 ounces to the ton.

THE TIP TOP MILL.—Wood River *Times*, Dec. 11: Ole Rorem, superintendent of the Tip Top mine and mill, was in town to-day. He said that he had no doubt but that he would be ready to start his mill for a trial run in about 10 days, and he is very confident of scoring a success.

ALMA & NELLIE WOOD.—Wardner *News*, Dec. 7: Interest in the Elk creek region of Yreka district centers at present in the Nellie Wood mine, where work progresses with earnestness and vigor. The force of men employed has been increased to 40 and the mill is dropping 10 stamps day and night. A period of renewed activity has set in, and before another season is at end the Elk creek gold belt will be as widely known as the silver girdle is that surrounds Wardner.

EMMA & LAST CHANCE.—The hoisting plant for the Last Chance mine is being put in place as rapidly as possible. Supt. Chas. Sweeny expects to have it in working order in two weeks.

STEMWINDER.—The wire for the Stemwinder tramway arrived on Wednesday from the works of Lescher & Sons, St. Louis, Mo. A. Denaugh has taken the contract for putting it up and his work commences to-day. In about three weeks we may expect to see the buckets wending their way from mine to mill.

PLACER CENTER DISTRICT.—From present indication the resources of the Granite present the appearance of being everlasting. The vein is of mammoth proportions and the ore averages rich; the mine has a world of wealth and keeps 80 men constantly employed in bringing it to light. The concentrator runs uninterruptedly and the shipments are up to the usual standard.

STEMWINDER.—Wardner *News*, Dec. 14: The work of putting up the wire tramway for the Stemwinder company is progressing rapidly.

SIERRA NEVADA.—A number of men were discharged this week at the Sierra Nevada mine in consequence of a change of arrangements made by the company in shipping ore. In future, sacking will be dispensed with and the ore shipped in bulk. A new bin has been erected at the mine, and another will be built immediately at the new siding.

LOWER CALIFORNIA.

ALAMO.—San Diego *Sun*, Dec. 16: Mr. Reed, who has been spending several months at the Alamo mines, has just returned from there and reports everything as progressing slowly but under the most favorable prospects. He says that the shaft on the Princessa is now down 106 feet and the crosscut at that depth had cut the vein and been sent into the vein four feet, when he left. The ore taken out at that depth is richer than anything found above it. The shaft on the Ulysses is down 100 feet. Some very rich ore has been taken out of the lowest depths in this great mine. The famous Scorpion mine had struck the richest ore ever found in camp. The owners, McGrath and Joseph, commenced their working shaft a short distance away from the possession shaft, where they found the ledge much wider and the ore much richer than in either of the former shafts on the vein. By those disinterested this is considered one of the most promising mines in camp. Governor Torres' mine, which is believed to be 12 feet wide, Mr. Reed tried in the Butler mill, making a cut clear across the vein for 12 feet. He took all of the broken ore in the cut, so as to get a general average, and it yielded $21 per ton. He says that the ore from the Elsinore has paid from $40 to $80 per ton. Judge A. J. Reeves and I. McWhister of London have bought one-half interest in the Lucas Mining Co.'s mill and will at once start the mill. They will put in a Wiswell mill in addition to the five stamps they have, also a rock-breaker and self-feeder. Their mill is near the Visnagre mine in the Santa Clara basin. L. Wiswell's mill has given universal satisfaction. The recent rains at Alamo have made water abundant everywhere, and many miners are now making money washing out gold from the canyons.

MONTANA.

MOUNTAIN VIEW.—*Inter-Mountain*, Dec. 9: The Mountain View, probably the richest copper mine on earth so far discovered, is sinking the main shaft for the 1000-foot level. The present depth of the shaft is 965 feet and sinking continues. The ground run through is perfectly stratified with stringers of copper glance, the richest of copper ore. Crosscuts are being run on the 900, the stations being completed, and no doubt arises but that when the lead is encountered in the crosscuts both the north and south leads will present a body of ore sufficient in quantity and quality to make an old miner's eye sparkle. The Mountain View mine ever since coming into the possession of the Boston and Montana Copper company has been continually on the increase in regard to the richness and quantity of ores. The old Lexington mine has had to lay off pending the arrival of Mr. R. B. Wallace, there not being enough ores to mix with the tailings now being put through the mill. Col. John Doyle reports a strike today in the Bonanza. The strike was made in an upraise from the bottom level and its extent has not yet been determined. Samples of the rock show it to be high grade. W. B. Sparkman reports a strike of fine-looking ore in the Keystone in the Oro Fino district. The shaft ran into the main ledge just below the 100-foot level. The lead appears to have about eight feet of quartz.

GRANITE MOUNTAIN.—Phillipsburg *Mail*, Dec. 12: The output for the week ending Dec. 12 was 53 bars of bullion, containing 77,500 ounces fine silver and 174.4 ounces fine gold.

A GOOD STRIKE.—Messrs. Sprague and Nettle have recently struck a 9-foot lead of ore on their claim near the Two-Per-Cent, at Tower. The ore is not very high grade, but with the quantity that is in sight it will pay well.

THE SILVER CHEST.—A contract has been let to run a crosscut of 200 feet on the Silver Chest, one of the claims now under the control of the Clark Syndicate. This action most certainly indicates that Mr. Clark is well pleased with the property, and a purchase will most likely follow.

THE ELIZABETH.—The work of sinking the 500-foot shaft on the (West Granite) Elizabeth was begun the latter part of last week.

NEW MEXICO.

NEW PRODUCERS OF ORE.—Rio Grande *Republican*, Dec. 7: The people of Las Cruces do not as yet realize the era of prosperity which is dawning upon the Organ mining camp, yet it is a fact that gradually, by the result of the incessant labor of a few faithful miners, the camp is proving to be one of the best in the Territory. It will not be many days until the long train of ox wagons now lining the road between the base of the mountains and Las Cruces, will be supplemented by many more, as other producing mines than the Bennett add their quota to the production. Next to the Bennett, the Comstock is now ranking as a producer. Over four carloads of ore are on the dump and the mine is now producing a carload a week of a fine carbonate ore which is valued at the smelters for its fluxing qualities. As depth is reached the grade grows better and the body larger. John Thompson has fairly "lived with" the Eureka for the past five years, working single-handed. He has a 200-foot incline which has exposed good ore, and the mine is now a little bank on which he can draw when he needs it. Twelve men took 600 tons of ore out of the Bennett in the month of November, an average of 50 tons to the man. John Shryock and Chas. Bouy have put the Excelsior shaft down to a depth of 100 feet and have just opened a new vein in which they have four feet of mineral.

UTAH.

SNAKE CREEK DISTRICT.—*Park Record*, Dec. 14: This district comprises a large area of country lying east and south of Blue Ledge and Uintah mining districts. Considerable work has been done in the district during the year now drawing to a close, though not on a very large scale. Many of the poor miners who have heretofore given much of their time to opening up their Snake Creek properties now find it to their advantage to pay more attention to developing their claims elsewhere and which are contiguous to recently found bonanzas. It is to be regretted that little or no capital has lately been invested in this undoubtedly rich district. The dead of winter now pervades there. There are many natural advantages for mining, notably the adaptability to tunnels, which is a comparatively and yet generally effective method of making developments. It has any quantity of rich ore reserves laid deep, and the float and croppings are encouraging signs for operations to be carried on in comparatively new ground, while the many claims that are already partly opened up will eventually be made extensive ore-producers. Considerable prospecting has been done the past season in the vicinity of Dutch canyon, and those who have worked there believe that lots of good ore will be mined there yet. It is a significant fact that the Anchor Company owns a vast area of ground along Pioneer ridge and the Bonanza flat country and have lately made purchases of several contiguous claims. Among the claims lying west of the Anchor and along Pioneer ridge which will ultimately make good records as ore-producers are George Pierson's, Smith Ehenger's and the Silas Reed estate's ground. The Montreal group, situated in the lower part of the district, is exploited by a 400-foot tunnel and two crosscuts. The Silver Bell, Columbia, Blue Bird and Natural Arch properties have had more or less work done on them the past season. They each have a fine vein and assays have been obtained from these claims running well in gold and silver and fair in lead and copper.

MECHANICAL PROGRESS.

Casting Plate Glass.

The recent establishment of plate-glass manufacture in this country may give interest to the following brief detail of the mode of such manufacture:

The casting tables, the most important piece of apparatus in a plate-glass works, are 19 feet long, 14 feet wide and 7 inches thick. Each is provided with an iron roller, 30 inches in diameter and 15 feet long. Strips of iron on each side of the table afford a bearing for the rollers and determine the thickness of the plate of glass to be cast. The rough plate is commonly nine-sixteenths of an inch in thickness; after polishing, it is reduced to six or seven sixteenths. The casting tables are mounted on wheels, and run on a track that reaches every furnace and annealing-oven in the building. The table having been wheeled as near as possible to the melting furnace, the pot of molten glass is lifted by means of a crane, and its contents quickly poured on the table. The heavy roller is then passed from end to end, spreading the glass into a layer of uniform thickness. The whole operation of casting scarcely occupies more time than it takes to describe it. Each movement is made with almost nervous rapidity. Few industries offer such fine scenic display as the pouring of molten glass. One feels like crying "encore!" it is so very brilliant. In contact with the cold metal of the table, the glass cools rapidly. As soon as possible, the door of the annealing-oven is opened and the plate of glass introduced. The floor of the oven is on the same level as the casting-table, so that the transfer can be conveniently and quickly made. When, after several days, the glass is taken out of the oven, its surface is found to be decidedly rough and uneven. A small quantity is used in this condition for skylights and other purposes where strength is required without transparency. It is known in the market as rough plate. The greater part of the glass, however, is ground, smoothed and polished before it leaves the establishment.

MACHINES FOR VENEERING.—The largest machine for cutting veneers yet constructed is said to be in operation in California, and is said to shave up logs 10 feet 8 inches in length with the greatest ease. The shavings which come from these machines are great, long sheets, in each of which is almost the entire wood of a big log, and from a single shaving is frequently made a mass of 2000 to 5000 berry-boxes. The logs are first cut into the desired length, then placed in a large steam-box and left for 12 hours subjected to the effects of exhaust steam, which so softens the wood that it can be cut into the thin sheets desired without checking or splitting into fragments; when sufficiently softened, the log is pushed into an immense lathe and revolves in front of the great blade exactly as a strip of wood in a turner's lathe revolves toward the chisel. After the water-soaked outer portions of the log have been trimmed off, a number of small, chisel-like instruments are adjusted, with the sharp-cutting edges pressing against the log, which make parallel lines partly cut through the whole length of the great white streaming shaving; these lines are the points of bending when the boxes are formed, and make that operation nothing more than a simple mechanical movement, as the wood bends readily at the partial cuts and forms the angles of the boxes. All but the core of the log is turned off into this long shaving, one-twentieth of an inch in thickness and nearly 1000 feet long, which is folded and broken into convenient lengths or strips, and of the proper width for a box. The last step in the manufacture is the fastening of the bottom and side strips together by an instrument called a stapler.—*Ex.*

A PERFECTLY ROUND CAR WHEEL is certainly very desirable, and as such perfection is not found in cast-iron wheels, as they come from the foundry, the device for grinding them to a perfectly true shape, which was introduced a few years ago and has been quite largely applied, would seem to be a very great advantage. But the objections to the use of grinding machines are becoming more evident than formerly and some companies believe that they outweigh the advantages. The Chicago, Rock Island & Pacific, after having employed wheel-grinding machines for several years, has decided to stop the practice, having found that a large proportion of its wheels when ground are reduced in mileage something like 20,000 miles. This is the result of their being cast irregular and not properly centered on the axle, so that in grinding much more material is removed from one side than the other. Of course, the wheel-makers are at fault; but it is doubtful whether perfection in the casting and mounting of iron wheels can ever be reached.—*Ex.*

"COLD SHORT" IRON DESCRIBED.—During litigation in a boiler explosion case in Toronto, Ont., recently, a number of experts were examined on "cold shortness" of iron. A broken rivet from the exploded boiler was shown in the court, and from the appearance of the fracture the experts said, under oath, that the iron in the rivet was "cold short." Mr. W. Raub, an eminent mechanical engineer, who was employed by the defense, stated before the court that no person could tell the quality of iron by the fracture unless he saw the fracture. Mr. Raub secured a bar of best brand of Lowmoor iron, took it to a blacksmith shop, cut a nick about one-eighth of an inch thick all around it, tapped it gently with a small hammer for about an hour, and then hit it hard with a sledge. It broke off "as short as a carrot." He then turned the other end over, after nicking it, and of course, the edge showed a beautiful fiber. The "short" end of the bar was first shown to the experts, who one and all said it was "cold short," but when the other end of the same bar was shown to them, they were dumbfounded. Mr. Raub had by his light tapping completely crystallized the one end of the bar, and had left the other intact.—*The Iron Industry Gazette.*

IRON AND STEEL are fast taking the places of wood for structural uses, and it appears possible that the growth of consumption in that respect will fully compensate for the lessening demand by builders of new lines of railroad in this country. But even in the railroad business there is room for a large consumption in the future, if only for the purpose of replacing old rails by new ones, and meeting the demand for fresh rolling stock to take the place of that worn out in the service. Still there is one important fact which may alter conditions to an extent now little thought of. It is that wood once worn out is a total loss, except for fuel, while only a moderate percentage of the other is lost in the wearing process. There is a constant tendency to increase the ratio which the old used over again bears to the total quantity in use, and it may be less than 20 years from now when the old will form much more than half of all the nominally new production in any given year. Of course, this would not obviate the necessity of employing labor in effecting the conversion, but it would make a great difference in the quantity of ore required to be taken from the mines, and still later along in the ages leave them comparatively little to do in furnishing new material. It may be rather early to speculate on this phase of economic science, but there is no more harm in now and then trying to look ahead than in the writing of whole books about "looking backward."—*Ex.*

WHAT IS THE LIFE OF CORRUGATED IRON? At a recent meeting of the Connecticut Association of Engineers, a paper by Mr. C. M. Jarvis was presented on "Iron Roofs." In the discussion which followed, Mr. Field was asked the question: "What is the ordinary life of corrugated iron?" He replied: "The life of a corrugated iron roof depends on what gauge of iron you use or whether you use it galvanized. You can put it on to last 100 years, but ordinarily it will not. Iron near the seashore will go faster than inland. There are instances where that iron has lasted 20 to 25 years; other times it has gone in 5 or 6. There is no repair except to put a new sheet on. You can take off any one sheet and renew it. We have had roofs on our place 17 years, and they do not leak very badly now. We keep them painted. A good many places where they have lost corrugated iron roofs they have not painted them. We use metallic paint. Those that last the longest are galvanized iron. Many people put on 26 iron, which is not much better than paper. If they will put on 18 or 20 galvanized, they will have a roof to last, practically, forever. They put on 26 frequently. There are three or four gauges—standard, Birmingham and others—and you must be posted on what gauge you are buying, for 26 in one might be 28 in another man's. You gauge it by the weight per foot."

AN INGENIOUS MACHINE.—Asa and Walter Pettengill have invented a machine for cutting up round or flat iron and steel, and much needed in mill work. It cuts round iron or steel from one-quarter to one-half inch, and flat up to quarter inch, as easy as one cuts a piece of card with pocket scissors. There is an opening for each size of round, while a drawing-shear cuts the flat. There are several unique movements and points in connection with the machine which must be seen to be appreciated, especially the return of the blade after a cut has been made, and which is made without any springs to offer any resistance to the cutting motion. A great advantage and saving of time results from the finished manner in which the work is left after the cutting.—*Rockville (Conn.) Journal.*

HONORING THE MECHANIC.—The first statue erected in this country to a workingman has been unveiled in Sacramento. It is in honor of E. J. Stevens, late master mechanic of the Southern Pacific, who had for years been in charge of immense railroad shops in Sacramento. The funds for the monument were contributed entirely by workingmen.

ENGLISH STOVE FOUNDRIES are away behind us in machinery. Holland has no stove works; their stoves are of thin sheet iron, and are made by blacksmiths. The English stove is a "warming stove," ours for heating. At Carron the molding, wheeling and packing is done by women suitably dressed, and the work does not look too hard.

ORGAN SPRINGS.—An industry of considerable note at Montpelier, Vt., is the manufacture of organ springs which are shipped to different organ manufacturers in the country. Last year over 90,000 of these springs were shipped. The buildings of the factory plant are substantial ones and are run to full capacity at present.

SCIENTIFIC PROGRESS.

Both Oil and Gas Solidified.

We have already alluded to a recently invented process for solidifying petroleum oil. This has been done by Mr. I. C. Hatch of Santa Cruz. The Santa Cruz *Surf* says: "He solidifies the crude petroleum oil by a chemical process and molds it into small bricks. A *Surf* reporter was shown several of the bricks, and also witnessed a trial of them, in which they were placed in a stove having a grate, and in which the solidified petroleum oil burned finely, giving forth a great heat. The bricks, however, will not be a success as fixed at present in some stoves, as they would, after partially burning, run together in one mass and cover the bottom of the stove, leaving no place for a draught, which is imperatively necessary. But this, like all other obstacles in other inventions, will probably be removed when Mr. Hatch has fully perfected his new method of preparing the oil, and can then adapt it to circumstances as required."

Natural Gas Solidified.

And now comes our contemporary *Light and Heat*, which informs us that a process of condensing natural gas has been invented and patented in Anderson, Ind., and is attracting widespread attention. The great possibilities of it have attracted the attention of the Standard Oil Company, and representatives of that corporation from Cleveland and New York have made the inventor flattering propositions should the plan prove a success. According to *Light and Heat*, the inventor states that there can be no doubt as to the possibility of his process. He is now engaged in the construction of the necessary apparatus, and will shortly give a practical exhibition by reducing a quantity of natural gas into solid substance. The process itself, as well as the machinery needed to carry it out, is very simple. Gas when transformed into solid matter is not dangerous to handle. Its expansive force is very great, and when the substance becomes heated above a certain degree it will become very volatile and will burst an ordinary cask or can, but the effect is gradual and it does not explode. The inventor claims that with a ten-horse power engine he can reduce enough gas in one day to supply a city of 50,000 inhabitants with fuel for 24 hours. These two inventions, if they can be carried out as set forth, must prove of almost incalculable value to the world.

The Astronomy of the Future Will be Largely Photographic.

Professor Schaeberle of Lick Observatory, en route to French Guiana to observe the total solar eclipse of Dec. 21st, said to a Chicago *Times* reporter:

"It is not the spectrum of the corona that astronomers are now interested in, but actual photographic images of it. Indeed, the astronomy of the future will be largely photographic.

"Here, for instance, is a plate of the great nebula in Andromeda, greatly magnified. Our best telescopes have heretofore shown it to be merely a blur of light. This plate shows you that it is really a spiral.

"This spiral formation runs through all the heavens, and we come upon it when we least suspect it. Here is a plate of a section of the Milky Way, which shows some of the stars arrayed after the same fashion. It is a curious fact that in that plate in your hand Prof. Burnham seems to have found a starless black hole in the Milky Way. With the longest exposure he could give there was not a gleam of a star in that point right there, while all about it was a mass of stars."

The latest report states that 21 observatories are now engaged in the international undertaking of photographing the entire heavens. Each observatory will have to take about 700 photographs in the zone assigned to it, and it is hoped to finish the work in three or four years.

ELECTRO-DYNAMICS AND GRAVITY.—While the laws of gravity are, no doubt, sufficient to explain the movements of the celestial bodies with respect to each other, says the *Electrical World*, other obscure actions have long been investigated, and the electro-dynamic theory is one which has often been suggested to account for them. It is, indeed, gaining ground for more than one reason. In the light of recent experiments, and in connection with the material properties of the electric current as now advocated principally by Dr. Lodge, it would seem that the ether is not to be considered, as heretofore, the medium through which the force binding the celestial bodies to one another acts, but that it is the actual binding element itself, fulfilling all the properties of an incompressible highly elastic fluid.

ANTHRACITE COAL.—A new and most important discovery of anthracite coal has been reported in Pennsylvania. The deposit is said to be 200 feet thick, and confirmative of the life-long dream of many old anthracite miners. They have believed steadfastly that underlying the region, at some depth, buried, there was a great basin of pure anthracite, representing the deepest bottom of the peat bog in which the anthracite was found. They argued that it would not only be of a thickness beside which a 16-foot vein, now considered an exceptional find, would be but as a streak, but that, being free from the faults and irregularities due to crust movements during its formation, it must be of even and flawless quality. The reported discovery seems to fill out these predictions so exactly that it is almost past belief. The fear of an early exhaustion of the anthracite coal field, which has been indulged in by many, may now be safely set aside; for, in addition to this new mammoth find, indications are rapidly multiplying which go to show that Pennsylvania has not the world's only anthracite beds. There is good reason to believe that anthracite exists in Colorado, Canada, Russia, France, and probably in Wales, to say nothing of the many and vast unexplored regions of other parts of the world.

THE ELECTRIC LIGHT ON PLANTS.—Fresh experiments have lately been carried out at the Winter Palace, St. Petersburg, which tend to show the fatal influence of the electric light on plants. It was observed that a single night's lighting was sufficient to cause the plants to become yellow and desiccated, which was followed by a fall of the leaves. The sudden passing of northern plants, used to sunless days and the weak light of the conservatory, into the dazzling light of drawing-rooms, must be regarded as the principal cause of this phenomenon. The rapidity and intensity of the pernicious influence of the electric light increase with the brightness of that light; the plants which are not attacked directly by the luminous rays do not appear to suffer. The foregoing facts agree absolutely with those which were observed in the experimental conservatory at the exhibition of electricity in 1881. It is also remarked that the effects vary much with the nature of the electrical apparatus employed. If arc lamps be used, which give a light much charged with violet radiations, the injurious effects will be quickly observed; if, on the contrary, incandescent lamps, which give a more yellow light, be employed, it is probable that the hurtful influence will be small, or not noticeable.—*Electrical Review.*

THE FOSSIL HORSE, as is quite generally known, differs from the existing species in having his hoofs divided, and is supposed to have become extinct many ages since; but Mr. C. B Williams has called attention to a quotation from Suetonius, which seems to imply quite a recent existence of this type of the horse wherein that writer says that "Cæsar made use of a remarkable horse, with feet almost human and hoofs divided in the manner of toes." Cæsar's horse might have been a possible example of what evolutionists term reversion of the modern to the fossil type.

A MECHANICAL TELEPHONE.—Intelligence from Glasgow states that an attempt is about to be made to introduce a purely mechanical telephone, styled "The Pulsion," there. No electrical current is used, and the instrument is exceedingly simple in construction, merely consisting of a steel india-rubber-lined button, to which the annealed steel wire is attached, a copper diaphragm, and sound-conducting springs. Experiments on a line about a third of a mile in length showed that the sounds transmitted were clearer than those sent by the most perfect telephones at present in use.

A NEW FLASH LIGHT.—Dr. Thomas Taylor, the veteran microscopist of the Department of Agriculture, Washington, has just invented a new flash light which promises to be quite valuable in ordnance practice. The inventor terms it the pyro-flash light. It is said to possess some very peculiar properties, and may be made to burn with any degree of rapidity, from very slow burning like a train to instantaneous flash. Its smoke is thin and light and quickly dissipated.

A NEW IMITATION OF GOLD.—An Englishman is now said to have invented a metal that can hardly be distinguished from gold. It is like the precious metal in all its best points, can be hammered and drawn equally well, and presents a good wearing surface. It is not a compound and gains its gold color from the action of a chemical. The inventor has placed samples of his discovery on the market and expects to begin its manufacture soon. It can be made for 60 cents a pound, and may be used extensively in the manufacture of cheap jewelry.

PARAFFINE FROM PEAT.—Paraffine distilled from a peculiar kind of peat is the object of a new industry which has sprung up in Brazil. About ten peat-beds are being worked at Marslin, and though the diggings have reached a depth of 150 feet, there is no sign of the supply being exhausted. The paraffine obtained is used in the manufacture of candles.

A BOTANICAL GARDEN OF ALPINE GROWTHS. A botanical garden in the Alps of Valais is situated on a cone-shaped knoll about 200 feet high, at an altitude above sea level of more than 5600 feet. Plants from all the Alpine regions of the globe will be cultivated.

LIGHT WITHOUT HEAT.—An inventor named O. L. McClellan, of Philadelphia, has succeeded in reproducing artificially the light of the glow-worm. The production of this illuminant means the utilization of energy without material waste and without heat.

GOOD HEALTH.

Health of the State.

The November report of the State Board of Health makes the following showing:

Reports from 104 localities, with an estimated population of 884,400, give the number of deaths at 902, which is a percentage of annual mortality at the rate of 14 04, which is a remarkably small death rate, and indicates a most favorable condition of the public health.

Consumption is credited with causing 156 deaths during November, or little less than one-sixth of the total mortality of the State for the month. Pneumonia, being quite prevalent, caused 63 deaths, which is an increase over last report. Bronchitis shows an increase, 38 deaths.

Diphtheria and croup, collectively, caused 49 deaths, which is a large increase from last report. Of these, 18 occurred in San Francisco.

During the earlier part of the month disorders of the bowels seemed generally to prevail, but after the excessive rainfall in the latter part of November, diarrheal disorders were not noticed so frequently as diseases of the respiratory system, which prevailed in quite a number of localities.

Diphtheria and croup were reported in Downey, Anaheim, Monrovia, Los Angeles, Santa Cruz, Jolon, Truckee, Gold Run, Redding, Mariposa, Salinas, Soledad, Ontario, Lockeford, College City, Fresno, Santa Barbara, El Monte, Gonzales, Santa Ana, Oakland, Sacramento, Benicia, Needles and San Francisco.

In Gold Run, Placer county, there has been quite an epidemic of diphtheria and croup, which Dr. Miner attributes to the bad sanitary condition of the town and the neglect of sanitary precautions in isolating those attacked. It is very evident to all right-thinking people that if we desire to limit the spread of contagious and infectious diseases, such as diphtheria, scarlet fever, smallpox, typhoid fever, etc., a law upon the statute-book will be necessary, making it compulsory upon all physicians, nurses or householders to notify the health authorities of the presence of infectious or contagious disease wherever it occurs within their knowledge.

If we had such a law, and the failure to notify was punished by fine and imprisonment, we would, by timely notification, be enabled to confine the disease to its place of origin by isolation, and subsequently, by disinfection, to destroy the contagion before it had time to get abroad. We will grant that with measles and whooping-cough this would be most difficult, as their most infectious stage is just before the outbreak of the eruption in one case and of the typical cough in the other. In these cases the contagion would be almost sure to have been diffused to a greater or less extent before the diagnosis of the diseases could have been made. But one of the most useful results of a law making the notification of infectious diseases compulsory would be the fact that it would enable health officers to give timely warning of infected families to the school-teachers and trustees, so that the children of such families could be excluded, for the time being, from the public school, and the spread of infection stayed. From the culpable carelessness with which children from infected premises, or even with the first symptoms of illness upon them, are allowed to attend school, we cannot wonder that diphtheria and scarlet fever are spread. Of course, a great deal of this is through ignorance of the dangerous nature of the infecting disease, and because it is generally unknown that the mildest attack in one child may produce the most malignant disease in another. Sanitary education will in time remove this difficulty, especially when the fact is fully recognized that these infectious diseases can be wholly controlled by timely precaution and proper quarantine measures.

KEEP WARM.—Rose Terry Cooke says: "If you want to be happy, keep warm. Women are eaten up with neuralgia, say the doctors. No wonder. They sit still all the morning by a hot register, then tie the five or six-inch strip of bonnet over their back hair, a bit of lace film over their bangs, put on kid boots, with silk or thread stockings underneath, and dawdle along the pave with bitter winds of winter smiting their temples, their delicate ears, their throats, and the bases of what should be their brain. Their outraged nerves shrink and quiver under this barbarous exposure. But no matter; their chest is well covered with fur cloaks and sacques, but cold feet, the numb ears, the reddened temples, the exposed neck, will have their own story to tell. Then you won't wear flannel next the skin. Why? Because your waists will look too large, and it is the style to be as near in shapeliness to that delightful and lovely insect, the wasp, as humanity can be forced. Do you really like to ache and groan and to be laid aside every few days with agonizing headaches or panting laboring hearts? Strange, if true!"

WHAT PRODUCES DEATH.—Some one says that few men die of age. Almost all persons die of disappointment, personal, mental or bodily toil, or accident. The passions kill men sometimes even suddenly. The common expression, "choked with passion," has little exaggeration in it, for even though not suddenly fatal, strong passions shorten life. Strong-bodied men often die young—weak men live longer than the strong, for the strong use their strength and the weak have none to use. The latter take care of themselves, the former do not. As it is with the body, so it is with the mind and temper. The strong are apt to break, or like the candle, run; the weak burn out. The inferior animals, which live temperate lives, have generally their prescribed term of years. The horse lives 25 years, the ox 15 or 20, the lion about 20, the hog 10 or 12, the rabbit 8, the guinea-pig 6 or 7. The numbers all bear proportion to the time the animal takes to grow to its full size. But man, of all animals, is one that seldom comes up to the average. He ought to live a hundred years, according to the physiological law, for five times 20 are 100; but instead of that he scarcely reaches an average of four times the growing period. The reason is obvious—man is not only the most irregular and most intemperate, but the most laborious and hard-working of all animals. He is always the most irritable of all animals, and there is reason to believe, though we cannot tell what an animal secretly feels, that, more than any other animal, man cherishes wrath to keep it warm, and consumes himself with the fire of his own reflections.

TO PREVENT COLDS.—A lady correspondent of the *Call* writes to that journal as follows: Every one knows how wet the backs of shoes and hose get by the bottoms of the skirts hitting them. More colds are caused this way than any other. Rubbers protect only the bottoms of the feet. Rubber boots cost but little more and will outlast a dozen pair of ordinary rubbers. The writer wears a pair of woolen socks over her hose, in the boots, an old dress skirt that water and mud will not hurt, a good gossamer and an umbrella, and goes perfectly dry in the heaviest rain, has no skirts to hold up, and carries her shoes or slippers if going to stay anywhere. Of course, white skirts are left at home, or carried with the shoes and another dress if desired. If anybody has one less cold by adopting the above, the writer will be sufficiently repaid.

RELIEF OF DEAFNESS IN OLD AGE.—Sapolini of Milan has described a method of his which he states has been successfully employed in 62 cases of deafness of old age. It consists in mopping the membrana tympani with a weak oleaginous solution of phosphorus. He claims that the treatment diminishes the opacity of the membrane, increases the circulation and improves the hearing.—*Kansas City Medical Index.*

USEFUL INFORMATION.

A Lesson from the Late Paris Exposition.

The thorough way in which statistics of all kinds are collected in Paris, says an exchange, makes the Exposition which has just closed particularly instructive, especially as an indication of how much weight should be attached to *resident* as distinguished from *non resident* population, something which it is very difficult—in fact impossible—to determine from the records of our own Philadelphia Exposition. The only definite fact obtainable in regard to the latter is, that out of nearly 10,000,000 admissions, only 24 per cent came by rail direct from exterior points and 35 per cent more came by rail from the city. How many of the city visitors were temporary residents who were in Philadelphia only to attend the Exposition it would now be hard to determine, even approximately. It is probable that somewhat less than two-thirds and certainly more than one-half of the visitors were from the 1,000,000 or so residents of Philadelphia and its vicinity, and only the remaining one-third to one-half represented the rest of mankind.

The Paris statistics make a still stronger case in favor of holding the exhibition in a city of the largest possible population if it is to be a financial success. The full official statistics are not yet at hand, but from the unofficial ones reported, it is quite certain that out of the 25,400,000 visitors at the Exposition, at least 68 per cent is to be credited to the permanent residents of the city of Paris.

Taking the above two instances as evidence, it would appear that to make a paying success of an exhibition, a city of large population must be selected. On this ground the probable comparative attendance at an equally good exhibition held in Chicago and New York, we would have in Chicago, with an approximate population of 1,000,000, a resident attendance of not more than 5,000,000, while New York and its immediate environs, with an approximate population of 3,000,000, would furnish 15,000,000 visitors. The outside visitors would vary but little in numbers from either city. Taking this view of the case, New York would seem to have a decided advantage as the place for the coming Exposition.

MICA IN STOVES.—It is stated that of two stoves, otherwise alike, one with clear mica around the upper part will radiate more heat through the mica than would be radiated through iron. Iron gives out most heat by the circulation of air over its surface, and is a stronger radiant than mica, but the latter has the advantage of being transparent to the direct radiation of a red-hot fire,

Wood Fiber for Spinning.

A new process by which wood fiber may be easily prepared for spinning has recently been devised. It is the "sulphite process." A party of gentlemen, among whom were Daniel Lamont, ex-Secretary Whitney of New York, Senator McMillan and Don M. Dickinson of Michigan, have been visiting Rumford Falls, Me., where they have been to look over the water privilege with a view to building a sulphite pulp mill.

The *modus operandi* of this process is quite simple and is said to be very practical. It is a German invention, and its application for reducing wood to a fiber which can be spun like cotton or wool, will, it is thought, lead to an important industry. The process of reduction is described by an Eastern cotemporary as follows:

Thin boards or laths, free from knots, and of any width preferred, are cut into strips in the direction parallel with the grain, and are boiled in a boiler containing a solution of sulphurous acid or bisulphite, this boiling producing disintegration without requiring the strips of wood to be reduced to very small pieces, the wood after boiling being dried in the open air or in specially constructed drying-rooms. By thus drying the product, the fiber, though originally weak, and tending to break at a slight strain, becomes comparatively strong, not resuming its very breakable condition on the addition of water.

Briefly, the damp masses on the frame are transferred to a traveling endless cloth, which leads them to a pair of rollers which may be plain or provided with corrugations in the direction of their length, the ribs of the one roller being made to gear into the recesses of the other one, resulting in a simultaneous strong bending and squeezing of the masses; the cutting of the material in passing through the corrugated rollers is avoided by causing the endless cloth to pass over the lower roller and by placing a canvas covering around the upper roller—the pressed masses fall from these rollers on to a second endless cloth, which conveys them to a second pair of rollers, from which they are conveyed to a third pair, and so on, say six times. These processes produce loose, coarse filaments, but to obtain the necessary thin long fiber, the boiled and pressed masses are completely dried, then combed in the direction parallel with the fibers by means of devices provided with pins or teeth of great strength; the separation of the extractable matter from the fiber produced by boiling the gums and soluble organic matter, is best effected after the fiber has been spun into threads.

AMERICA is "great" on big things if she is young. The longest suspension bridge in the world is the one between New York and Brooklyn, 5989 feet in length. The largest single fortification in the world is Fortress Monroe, cost over $3,000,000. The loftiest active volcano is Popocatapetl, in Mexico, 17,784 feet above the sea level. The largest park in the world is the National Park (Yellowstone) beyond the Rocky mountains. The largest body of fresh water in the world is Lake Superior, with an area of 32,000 square miles. The largest cavern in the world is Mammoth Cave, in Kentucky. The largest trees in the world are the mammoth trees of California, some of them 376 feet high and 34 feet in diameter at the base, indicating an age of about 2500 years. The largest auditorium in the world is said to be the one just opened for an opera-house in Chicago.

TO PREVENT THE FADING OF GOODS IN SHOW WINDOWS.—A Continental exchange, referring to the evil of fading or bleaching of many kinds of colored articles when exposed in the store windows, says that this fading or bleaching is brought about only by the white rays of the sun's light, and, where it occurs, it shows that the glass is more or less perfectly colorless. It is found that if, instead of such colorless glass, the window panes consist of glass which is slightly yellow, the bleaching or fading process is prevented. Where the glass is colorless and cannot be replaced by slightly yellowish tinted glass, the desired effect may, it is said, be produced by simply giving the panes a coating of copal varnish.

WATERPROOF WHITEWASH.—A waterproof whitewash is in use in Germany. The powder from three parts silicious rock (quartz), three parts broken marble and sandstone, two parts of burned porcelain clay, and two parts freshly slacked lime, still warm, are mixed together. This forms a silicate, if often wetted, and becomes after awhile almost like stone. It is applied quite thickly to a wall or other surface, and allowed to dry one day. The next day it is covered frequently with water, which makes it waterproof.

BLUE SOAP.—To produce a blue soap, the use of which renders the subsequent employment of blue in laundry work unnecessary, incorporate with ordinary soap a solution of aniline green in strong acetic acid. By the action of the alkali of the soap, the green is converted into blue, uniformly coloring the mass.

AN INGENIOUS automatic machine has been invented by Mr. J. Hope, mechanical engineer of Liverpool. The machine receives the cash, places it to the depositor's credit, and gives a receipt for the amount lodged.

ENGINEERING NOTES.

A Stupendous Scheme.

There has been set on foot a scheme to construct a ship railway between the St. Lawrence river and the Bay of Fundy. The Dominion Government has undertaken the work which will reduce the 500-mile trip around Nova Scotia to 17 miles. It will be called Chignecto Marine Transport Railway and will cost over $6,000,000. The track weighs 110 pounds to the yard. It will take two locomotives to draw a car holding a vessel. The trip will occupy a little over two hours' time. The tariff will be 50 cents per ton on cargoes and 25 cents per ton on the vessel. Hydraulic jacks of immense power will be used to raise the vessel on the car, which can be accomplished in half an hour. This is specially applicable for purposes of war, the car being large enough to transport the largest war-ship.

In addition to the above the Dominion Government is constructing a three-million dollar canal at Sault Ste. Marie, to be known as the "Soo Canal." This canal will be a triumph of engineering skill. It has been clamored for by politicians for two generations. The Government admits that no pressing necessity for the canal exists; but in the completion of the last link in this Canadian route they all see an evidence of the determination of Canada to work out her own destiny on the American continent.

The "Soo" Canal will rank with its namesake on the American side. The engineers are overcoming great obstacles and deserve no ordinary praise for the boldness of their design. The canal is to extend across St. Marie island, in St. Mary's river.

Canada will soon have an independent and greatly shortened route from the head of Lake Superior to the Atlantic sea-board. The United States cannot enjoy the same advantage, because American vessels sailing from Lake Erie to Lake Ontario ports are dependent on the Welland Canal, a water-way traversing Canadian territory.

MAKING THE SUN WORK.—One of the most notable inventions displayed at the Paris exhibition was an apparatus for transforming the heat of the sun into motive-power for pumping water and other mechanical uses, says the Goldsboro *News*. It is the device of a French inventor named Charles Tellier. The apparatus is of great interest as foreshadowing the time when solar heat, in combination with electric transmission of force, will be made to furnish motive-power for all engines and take the place of coal and steam, a change which will vastly cheapen manufactures and travel and greatly enhance human comfort the world over. The heat which comes to the earth in the sun's beams is, as has long been known, the equivalent of from one to five or more horse-power for every square yard of the earth's surface, according to the latitude and the season of the year.

ROME TO BE MADE A SEAPORT.—A great scheme for making Rome a seaport is under the serious consideration of the authorities, and appears likely to be undertaken at no distant date. It is proposed to cut a canal 80 metres wide and 10 metres deep from the Tiber, near the church of St. Paul, outside the wall, to the seashore at Castel-Fusano, a distance of 18 kilometres, or 11¼ miles. An American company would assume the construction of the works, and the estimated expense is 60,000,000f. The enormous impetus which will be given to industry and commerce in the capital and in the whole province if this scheme can be carried out can hardly be over-estimated.

A RUSSIAN ENGINEER. — Count Antonsie Zdzairski is visiting this country in behalf of his government to inspect with a number of other engineers the railroads of the U. S. The government of Russia is building a railroad across Siberia to the Pacific ocean. There will be 4000 miles of track and 2500 miles of river transportation. Count Zdzairski's mission is to inspect the Canadian Pacific, as the climatic conditions of Canada are much the same as those in Siberia.

A NEW BRIDGE. — M. Effel, the builder of the great tower in Paris, has recently invented a bridge which promises to "fill a long-felt want" of the railroad companies. It is to be used temporarily in the place of the ordinary bridges when they have been damaged. It is made of steel, carries a track, and weighs, with a length of 150 feet, about 86 tons. It can be put in position from either end without the aid of machinery or any preparation, simply by human hands.

COMPARATIVE COST.—The cost of running street railways with horse-power and with electricity has been carefully estimated, and for the purpose of comparison a line running 50 cars is taken. Such a line, operated with horses, costs $303.75 per day, and with electricity, $68 50. The difference in favor of electricity is $231.25, or $4.62 per day saved on each car.

THIN IRON.—Iron is rolled so thin at the Pittsburg Iron mills that 12,000 sheets are required to make a single inch in thickness. Light shines through one of these sheets as readily as it does through greased tissue paper,

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Passing Events.

The continuous rainy weather has been felt all over the State, and in some portions damage has been done by the flood of water pouring down from the mountains. The rainfall for this period of the year is unprecedented, and still it continues to rain.

Gov. Waterman has telegraphed to Senator Stanford that as hydraulic mining has ceased, the $250,000 appropriated and in the hands of the War Department should now be used to save the navigation of the Sacramento river.

Before the PRESS is printed next week Christmas will have come and gone; so it behooves us to take time by the forelock and wish our patrons "the compliments of the season."

Judge Sawyer's decision in the Francœur-Newhouse case, referred to last week, is loudly condemned by mining men, and it is thought it will not stand in the United States Supreme Court. The miners on railroad land will now have to obtain title from the railroad company and pay for it.

THE ALL-AMERICANS.—Marcus D. Boruck says the Governor is about to notify all commercial bodies on the coast to make preparations for the reception of the delegates to the Congress of American nations, who will arrive here in about six weeks.

PROF. GEO. DAVIDSON has returned to San Francisco from the International Geodetic Conference at Paris.

The Folsom Dam and Debris.

Although not intended for any such purpose, the dam built by the State at Folsom will very probably serve a purpose from an engineering point of view, which will have a decided bearing on the much-vexed debris question in California. It is pretty certain that it will catch a large amount of debris, as well as water, and although measures have been taken to get rid, as occasion demands, of that which lodges near the dam itself, the backing up of the water will cause a deposit for some distance back.

The unprecedented early storms and resultant floods filling all the water-courses of the mountains bankfull, will bring down this winter an enormous amount of debris—more than has been the case for years past. There will be no way of telling how much until the water gets low, but it is pretty certain that there will be an immense quantity. The private debris dams in the side canyons made to catch the material from any one mine will not give any such illustration as the dam built by the State on a main stream.

The water now pours several feet deep over the edge of the Folsom dam, which has stood the pressure well. It is just possible, however, that after the floods subside the bottom will be found nearer the top than was expected. In other words, it will perhaps serve for just such a debris dam as the hydraulic miners wanted to see built by the Government or State to test the efficiency of dams for holding back detritus from the mines.

Annual Expenditures.

Only one more week remains in which to commence the work of performing the labor or making the expenditures on mining claims required by the U. S. mining laws. Those who have not already complied with the law will now realize how foolish they have been since the stormy weather of this month all over the coast has greatly increased the difficulty. Earlier in the year, when weather is pleasant, the work could be done with no discomfort. Doubtless, the weather will have much to do with the number of relocations this year, since many men who are at all doubtful of their claims will let the time pass by and take the chances of any "jumping" being done.

It is very probable that the projected law to change the date on which claims are forfeited will be passed at this session of Congress. In fact, it should have become a law at the session when introduced. It will be much better to have the date fixed at some other time than the dead of winter, for there are certain people who will put off the work until the last moment, anyhow, and these must now risk the mountain storms.

During the past two months, while miners have been performing this assessment work in various camps, we have noted that a number of strikes have been made. The men have gone to work rather to comply with the law and hold their claims than in the expectation of making any actual development. Yet in a number of instances good ore has been found and mines made out of prospects by this enforced labor.

Silver-Mine Owners and Silver.

The Granite Mountain mine of Montana, a famous silver mine, disbursed in dividends to stockholders the last fiscal year the sum of $1,900,000. They mined 37,248 tons of ore and milled 35,711 tons at an average cost for milling of $10.61 per ton. Of the average cost of treating a ton of ore, $2.73 goes for salt, $1.90 for fuel, and 74 cents for quicksilver. They used 5123 tons of salt last year. It will be seen that the mine is a pretty big one, and that it is paying well; but it ought to pay better. To show the interest silver-mine owners have in the free coinage of silver, the case of this single mine may be cited:

Up to the close of the last fiscal year the company had paid 55 dividends, amounting to $6,700,000. Since then four more have been paid, including the one on the 9th of November, making $7,600,000, or $19 per share. Tools were first sent to the mine October 8, 1880. Expenditures of all kinds up to July 31, 1889, were $4,052,512. This includes the cost and working of the property and all kinds of expense. During that period the mine produced 10,989,859 ounces pure silver and 6521½ ounces pure gold, realizing the gross sum of $10,938,-800. Under the free-coinage law in operation prior to February, 1873, this product would have netted the sum of $14,335,135, showing that the company has lost $3,334,335, or 30 per cent of its gross income, because of the inability to get the silver coined on the same terms as the gold. Had there been free-silver coinage during this interval, instead of $6,700,-000 in dividends, stockholders would have received over $10,000,000. And yet the "gold bugs" cannot see why the Western mine-owners should make such a fuss over the silver question.

The Old Alder Gulch.

Mr. L. A. Fenner of Alder Gulch, Montana, an old subscriber of the PRESS, is in San Francisco on a visit with his family. Mr. Fenner has been mining in Montana for 25 years, and this is his first visit to the metropolis. In fact, he says he never saw an electric light until he got to Ogden the other day. Mr. Fenner has lived in the Territories all his life and never had a chance yet to vote for a President of the U. S. He is going to Nevada and Placer counties to look at the mines and may invest in some land in that section for his boys.

Mr. Fenner says about 120 men are working over the old ground in the famous Alder gulch which yielded about $75,000,000 in gold in 1863-4-5. The early-day work was done by sluicing, but the miners then were good judges of ground, for the men now make more out of the old worked ground than the patches which were left. The gulch was originally divided up into 100-foot claims, but now many claims are owned by one person. Some companies own a mile, and Mr. Fenner himself owns half a mile of the gulch.

He says they ought to have a company with half a million of capital to bring in water from the Madison river, and it would be a good investment. Thus far the miners have failed to interest any one, and the claims are only worked by flumes and primitive methods. The gulch has been worked for 15 miles. At the upper end the gold is coarse, and some nuggets worth $600 to $700 have been found. The lower eight miles of the gulch yield gold that is comparatively fine, a nugget of $7 or $8 being a rarity.

Mr. Fenner is the inventor of a machine well adapted for working this class of ground, since it removes all the rocks, carrying them out of the way. He uses it on his claim, and has done better than any of the other miners this year. It does not require very much water to operate it, and would be a useful device in portions of this State. Mr. Fenner will spend the winter in California.

Academy of Sciences.

At the meeting of the California Academy of Sciences on Monday evening, Dr. Harkness presided. The librarian reported an addition of 50 books to the library. The following additions were made to the museum: A large number of birds, eggs, nests and rodents, collected by the society's expedition sent to Lower California during the present year; a variety of birds' eggs donated by R. W. Price, A. A. Caldwell, R. N. Jones, Robert Taylor and James B. Kent, and 204 specimens of lepidoptera, donated by Dr. H. H. Behr.

Walter E. Bryant read an interesting paper upon the birds of the peninsula of Lower California, Mexico. The paper was originally written as a report upon a collection made by Mr. Bryant in the vicinity of Magdalena Bay in 1888, and now includes the results of his field work of 1889 and embraces the known avi-fauna of the entire peninsula and adjacent islands. The peninsula of Lower California, the speaker said, has lately attracted considerable attention as an ornithological field. Previous to 1888 the studies of Lower California had been confined to Gerros and Guadalupe islands. Through the courtesy of J. P. Hale, Mr. Bryant made researches on Magdalena and Santa Marguerita islands. He gave a description of the islands and his journey thence to San Jorge, a distance of 120 miles, and from there across the peninsula to the Gulf of California, referring to the plains of San Julio and San Pedro and the Comondu Canyon which he traversed on the way. From Comondu Mr. Bryant traveled overland 597 miles to San Quintin. His observations on the way will be set forth in his work to be published on the birds of Lower California. The paper was illustrated by stereopticon slides.

Dr. H. H. Behr read a brief paper on "The economy of nature as exemplified by vegetable and animal parasites."

W. C. Burnett of the Committee on Nominations presented the following list of names that had been selected by them to be offered for election as officers of the Society for the ensuing term: President, Harvey W. Harkness; First Vice-President, H. Herman Behr; Second Vice-President, George Hewston; Recording Secretary, J. R. Scupham; Corresponding Secretary, Fred Gutzkow; Treasurer, I. E. Thayer; Librarian, Carlos Troyer; Director of Museum, J. G. Cooper.

Ex-Judge Currey presented the following opposition ticket: President, Joseph Le Conte; First Vice-President, H. H. Behr; Second Vice-President, George Hewston; Recording Secretary, J. R. Scupham; Corresponding Secretary, Fred Gutzkow; Treasurer, I. E. Thayer; Librarian, E. S. Clark; Director of Museum, J. G. Cooper. Trustees, the same as the regular ticket.

An Iron-Frame Battery.

M. P. Boss, the well-known millman, has just patented through the MINING AND SCIENTIFIC PRESS Patent Agency an improved form of iron-frame stamp battery. In the ordinary form of iron-frame batteries the frame is directly secured to and built up from the mortar. The jar of the stamps is, therefore, carried directly to the frame and there is considerable strain and racking thus put upon it.

The improvement made in construction by Mr. Boss is that the frame and the mortar are not directly connected, but are both bolted to the sole plate, and the jar of the stamps in the mortar is communicated to the frame indirectly through the sole plate and is, therefore, materially reduced. In the frame itself a novelty is to be noted, which results in simplicity of construction, involving a minimum number of parts, thereby reducing the number of joints and materially increasing the rigidity of the entire structure.

The boxes in which the cam-shaft is mounted are formed directly in and are integral with the side castings of the iron frame. These boxes are made semi-circular, entrance for the shaft being gained through wide-open fronts made in the castings. There are no tops for the boxes, the shaft lying directly in them and is held therein by its own weight and the weight of the stamps on which its cams operate. An inwardly and downwardly inclined flange on the inner front side of the mortar better receives and directs the splash to the screen, for, on account of its inclination, any pulp striking it must rebound directly upon the screen.

In stamp-mills of this class, where the stamps drop only by their own weight, unassisted by any acceleration, they cannot be driven beyond a certain speed, for the cams will, if rotated too rapidly, catch the tappets before the stamps have delivered their blow. Accordingly, springs have been used to accelerate the drop of the stamps, so as to provide for a more rapid operation. The feature in this regard in this battery lies in the arrangement of the accelerators, whereby they are adapted to be readily thrown into action or out of use, according as a more rapid drop or a normal operation is required. Mr. Boss also provides an easily-operated means for hanging up the stamps. The hanging-up fingers are mounted on eccentrics and these eccentrics are rocked by bar-levers, so that the fingers can be easily raised when under the tappets to elevate the stamps.

CHAS. P. SHEFFIELD of the Pacific Saw Manufacturing Co. died in this city last Saturday. This firm was the first to manufacture saws on this coast. In 1865 the firm made at their shops two 12-foot mill saws, the first ever made here.

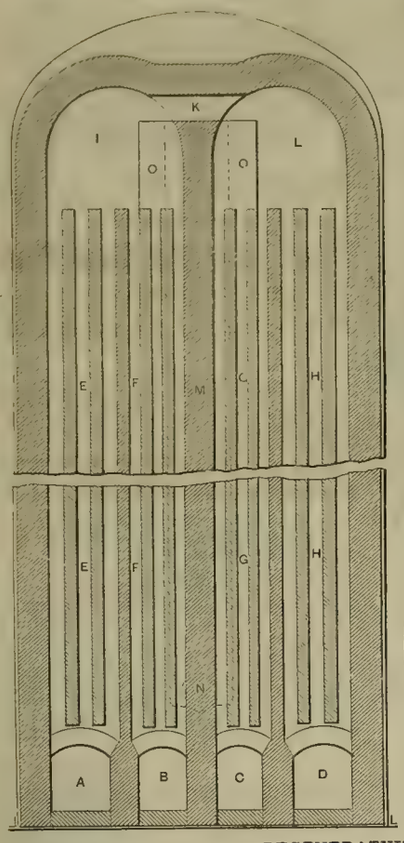
ANY ONE in want of machinery for sampling works should look at the advertisement in another column concerning the Daggett sampling works. A full description will be given to applicants for information.

SENATOR WILSON of Washington has introduced a bill for the establishment of an assay office at Spokane Falls.

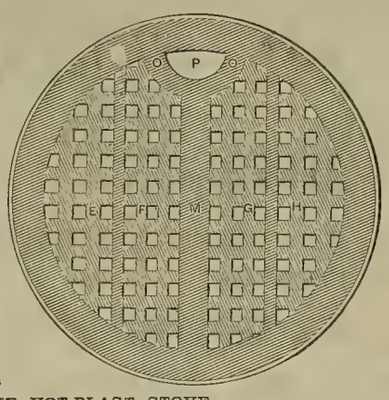
Regenerative Hot-Blast Stoves.

As a means for increasing the efficiency in modern blast furnaces by supplying to them blast of a much higher temperature than is now possible, J. T. Wainwright of Pittsburg, Pa., offers as a suggestion a modification in the construction of regenerative hot-blast stoves. Stated briefly before the American Institute of Mining Engineers, the plan proposed is to pre-heat both the gas and the air for its combustion in a manner similar to that generally adopted in Siemens open-hearth furnaces. After thus carrying the temperature of the stove to a point much higher than that common in hot-blast stoves, the cold blast passes through it. Without entering into the details relating to the reversing valves and the system of flues, the general plan may be outlined as follows, referring to the accompanying drawings: The valves are so placed in heating up the stove that the blast-furnace gas enters at *B*, Fig. 1, and the cold air for combustion at *A*. Ascending in flues, *F* and *E*, respectively, combustible gas and air meet and mix in the combustion chamber, *I*. Flowing through *K*, they descend through the flues, *G* and *H*, escaping through the chimney. In this manner the walls of the combustion chambers, *I* and *L*, are highly heated, and the right-hand side of the stove is carried to a higher temperature. By reversing the valves, blast-furnace gas enters at *C* and cold air from combustion at *D*. Both are pre-heated in their ascent through the flues *G* and *H*. They burn in the combustion chamber, *L*, and the hot gases of combustion, flowing through *K*, *I*, *E* and *F* to *A* and *B*, heat the left-hand side of the stove. In this manner the stove is carried to a temperature greater than that of those now generally in use, in which air and gas are burned without preliminary pre-heating. In the plan proposed, that side of the stove will of course be relatively cooler through which cold air and furnace gas last passed in its ascent to the combustion chamber.

VERTICAL SECTION.



HORIZONTAL SECTION.



REGENERATIVE HOT-BLAST STOVE.

After having sufficiently heated the stove in the manner outlined, the cold blast is admitted through all the flues, *A*, *B*, *C* and *D*. It ascends through the highly heated regenerative material to the chambers at the top and descends through the flue, *P*, Fig. 2 (dotted in Fig. 1), through *N*, Fig. 1, through the open hot-blast valve into the cold-blast main.

A desirable feature of the design suggested is that the highest temperature is maintained at the top of the stove, so that the material in the lower parts, which supports the greater weight, is thus protected against the effects of excessive heat.

Ticket-Holder for Piece Goods.

Samuel Bauman of Santa Cruz has patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, a device for marking goods in dry-goods stores, such as are known as piece goods. He terms the device a ticket-holder, and it consists of a plate folded to fit the end of the board on which the goods are rolled, and having a slot in which the ticket or card may be slipped. The device is shown in a cut on this page.



BAUMAN'S TICKET-HOLDER FOR PIECE GOODS.

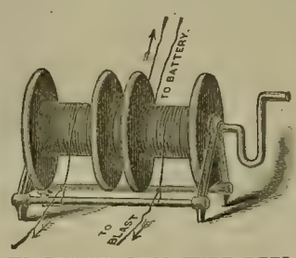
What are known as piece goods are usually rolled upon boards, and being laid upon the shelf with the ends presented to the front, it is difficult to properly mark the goods so that their price, number, etc., may be seen at a glance. The plate devised by Mr. Bauman has its sides triangular in shape and folded so as to just slip over the end of the board on which the goods are to be rolled. The plate is secured to the board by spurs which engage with the wood. At the point where the plate is folded over the end of the board, slots are made, forming tongues which are raised from the surface of the end of the plate so as to admit the ticket or slip upon which the necessary figures and words are printed. The ticket slips into the space beneath the strips. Upon these slips are printed the matter that is necessary to identify the goods, giving number, price-mark, etc., and the slips are easily introduced and removed at will. When the goods lie upon the shelves these slips are permanently exposed, so that they can be easily read at a glance. The plate also prevents the end of the board from splitting.

Electric Blasting Apparatus.

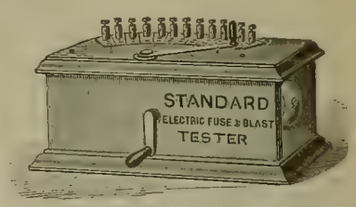
The "Pull-Up" magneto-blasting machines illustrated on this page are specially constructed to meet the requirements of those who desire to fire a large number of shots at one time. These machines are strong and durable. The iron base and bottom will be found a great improvement and protection against wear and dampness; the operating device is new and simple in construction; the operating bar after being pulled up to fire, will fall back into its place of its own weight, and is ready to be used again. These machines will fire any make of electric platinum fuse.

In electric-blasting, leading wire forms a very important part, and great care should be taken to have it in good condition and in a convenient form to use. The Victor reel, shown on this page, is a simple and practical device to keep the leading wire on. The reel is made so as to have a continuous wire from battery to blast. Both wires are separated on the reels, and can be run off to any required length. There are no loose joints or bare connections. The reel will hold over 1000 feet of wire, 500 feet on each end and five to ten feet in the middle to reach the battery.

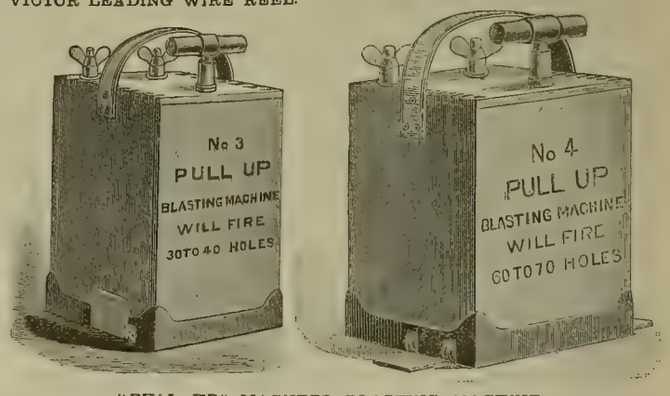
Leading wire is very liable to crack and split from constant bending and jarring, and should occasionally be tested. For this purpose a machine herewith illustrated, is used, called the Standard electric fuse and blast tester. This machine is intended only to test electric fuses or exploders before placing them in the charge holes to blast, to make sure they are all right and perfect, so as to avoid the expense, trouble and danger of a miss fire or an unexploded hole, or to make doubly sure. With the same machine the charge can be tested before firing it to make sure all connections are perfect before putting the leading wire to the battery. If the blast fails after such testing, the trouble must be with the battery. All blasters know the trouble and danger caused by a bad fuse in the charge; it necessitates the drawing of the charge hole or redrilling another hole, and many accidents and deaths have occurred in performing these dangerous operations. In all electric machines there must be a complete circuit. The same rule applies to this machine. Its size is 5 inches x 6 inches x 10½ inches, and weighs 10 lbs. It will test from one to 12 fuses at a time; it has 13 binding posts on top of box, with a brass switch for completing the circuit. A small handle in front to operate with, and the sounding bells on the right-hand end. The mechanism is inside the box.



VICTOR LEADING WIRE REEL.



STANDARD ELECTRIC FUSE AND BLAST TESTER.



"PULL UP" MAGNETO BLASTING MACHINE.

To test the entire blast before firing, it is only necessary to place the ends of the leading wire in the right and left binding posts, turn the handle, when the bell will ring. Leading wire should often be tested separately, as it is liable to crack and break in bending and have imperfect joints. Its heavy insulation makes it difficult to find these defects without the standard tester. The Parke & Lacy Co. of this city are agents for these appliances.

A. D. WILCOX has sold the Sunrise and Moonshine mines in Winnemucca mountain to McMannis & Gunter, who have been engaged in mining in Lewis district, Lander county, Nev., for some years.

Our Naturalization Laws.

President Harrison in his recent message gives utterance to the following:

> Our naturalization laws should be so revised as to make the inquiry into the character and good disposition toward our Government of the persons applying for citizenship more thorough. This can only be done by taking fuller control of the examinations, by fixing the time for hearing each application and by requiring the presence of some one who shall represent the Government in the inquiry. Those who are the enemies of social order, or who come to our shores to swell the injurious influence and to extend the evil practices of any association that defies our laws, should not only be denied citizenship, but a domicile.

This is perhaps the most radical deliverance on this subject that has emanated from so high a public functionary, and may be regarded as a sort of weather-vane on top of the political barn indicating the current of popular opinion.

It is certainly growing more evident every day that our naturalization laws need modification, at least in one particular. A foreigner who seeks the privilege of becoming a citizen of the United States is required to renounce under oath all allegiance and fealty to any foreign prince, potentate, State or sovereignty, and particularly the State or sovereignty of which he may have lately been a citizen or subject. This is well enough, provided it is his honest intention to become a peaceful and law-abiding citizen. But it is obvious that a large number of foreigners have been coming, and are still coming to this country, who are anxious to be clothed with American citizenship merely to protect them in their mischievous and revolutionary schemes against the Government they profess to have abandoned. There is danger of this class embroiling our Government with nations that we are on friendly terms with. Already there has been a deal of unpleasant diplomatic strife growing out of this source of irritation.

But this is not the worst feature of the case. It is a well-known fact that there are large numbers of professed Socialists, Nihilists, Anarchists flocking to our shores who acknowledge allegiance to no form or system of government. They do not believe in the existing order of things. They would resolve the whole social fabric back into chaos and night. Monarchies and Republics are equally obnoxious to them. If they had their way, they would confiscate all property and turn all government into a vast commune. When such people as these take the oath of allegiance, they swear falsely, for if their power were equal to their will they would overthrow the whole social framework of the world. Now, a man who avows such political sentiments should, in the language of President Harrison, "not only be denied citizenship, but a domicile."

Another phase of this question that is more and more attracting public attention is the evils of unrestricted and promiscuous immigration. Those who long hung on the sentiment that America is the refuge of the oppressed of all nations have been reconsidering the matter in

the light of recent events, and judging from the number of bills that have already been introduced into Congress, the leaders of all parties are impressed that the time has come for more thorough and rigid legislation on this subject. The investigation of the Ford Committee, while it merely skimmed the surface of this great and pervading evil, amassed a pile of evidence, which shows that something should be done, and that promptly, not only in the name of patriotism, but of humanity. For Americans are not only injured by indiscriminate immigration, but the poor immigrants are often cruelly and bitterly deceived, betrayed, enslaved and robbed.

Now this matter is one that both the native-born and naturalized citizens are equally interested in, for it is certain that no people, no matter how ingenious, industrious and thrifty, can long stand such blood-poisoning as has been going on. Already the pyæmia has widely spread through our body politic, corrupting politics, filling our cities with ignorance, vice and wretchedness, and hospitals, prisons and asylums with disease, crime and beggary, largely increasing the burden of taxation.

If Congress has any sense or courage left, we may expect this session such a modification of the naturalization laws as will eliminate undesirable citizenship from our politics, and such restrictive legislation as will well guard the gates of our harbors at least against paupers, anarchists, ignorance, ticket-of-leave men and the like.

Wastage of the Precious Metals.

EDITORS PRESS:—In several editorials of your recent issues I note your distrust in the present system of saving gold. To quote your language, "very much remains to be done before it can be said that this branch of the science of mining has been placed in a satisfactory condition." Here I wish to say that the MINING AND SCIENTIFIC PRESS for many years has more clearly realized the truth of these ideas than the great majority of working miners, as your articles from time to time have shown. You, and possibly many of your old subscribers, are well aware that for 15 years I wrote more or less on the "Wastage of the Precious Metals;" besides, I published over 10,000 pamphlets, giving much important data on the subject. Save the compliment of being quoted by foreign journals and mining works of recent issue, I found one might as well save time and paper, as the quartz miner generally is content with looking at the stamps rise and fall, and concludes that what he gets is all the value obtainable, and for the reason "that gold is the heaviest of metals" and that "silver plates do all that can be done toward saving the smallest atom of gold."

This, I think, is the first article I have written on this subject for six years, and to write this I know is lost time, as no one seconds the ideas excepting possibly yourselves and a few who have taken the time to closely investigate the loss. Every year advances the advantages of increasing the per cent of gold-saving, but here I will say, with all the new appliances, that the stamp-mills are not saving near what should and could be saved.

Did I choose to give public the data I have from actual practical working in the past several years, they will be pleased to read it, but there it would end. I have wasted time enough that way already.

You speak of the Mining Bureau bringing available matter together. What the Mining Bureau should do, and this is the main purpose of this article, would be to have an especial milling expert, who would have the duty of testing the working of mills and their percentage of loss of gold. The mere telling of millmen that they are not getting over 40 per cent of the value of their metal (and many are not) amounts to nothing; but prove it by showing him the metal from the ore he has washed off, and he begins to squirm and is willing to listen. California realizes about $14,000,000 from her quartz mines; half as much more might be added to this amount from the rock already mined, if millmen more clearly realized the loss and saved the per cent that they should.

One single season's testing of mills and the making the millman more clearly realize the loss, would be of more value to the State in every single year than the cost of maintenance of the Bureau from its commencement and for ten years to come.

I am well aware that my idea of so much loss will be ridiculed by many, who will assert that they "are saving 80 and 90 per cent." All right, gentlemen. I am content while you are happy in the belief. I hope not to gain the displeasure of my fellow-millmen, but it matters not a whit to me what they think of my views. I have "stubborn facts," and the future mining age will prove my position. But I would like to see more heed taken as to the loss. It is their gain and the State's gain.

ALMARIN B. PAUL.

Middle Creek P. O., Shasta Co., Cal., December, 1889.

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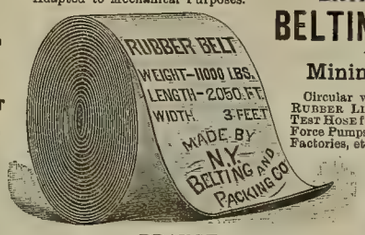
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On Market St., corner of Tenth, is the most realistic and interesting picture ever produced. Read what General Howard says of it in our Catalogue.

Open, 9 A. M. to 11 P. M., Except Sundays.

Merry Christmas.

It would seem that with each passing year this day dawns more gloriously than ever before; perhaps it is owing to the fact that the Song of the Angels is becoming better understood. Under the influence of a cold and frosty creed, that hated merriment and joy, this day was long neglected. It was always dear to the people of Germany, but in the dissenting regions of Great Britain and in our colonial days Christmas was a day regarded as partly wicked and largely a piece of superstitious stupidity. But as religion became more and more imbued with the spirit of love, the Church has been more ready to find happy days in the year. Days of gloom fell into neglect; days of happiness came into a new popularity. Thanksgiving has superseded fasting. The floral emblems we see in special profusion in all the churches during the Christmas and Easter festivals show that religion has moved into a more genial and tropical clime; that it has ceased to throw stones and prefers to gather the sweet lilies. Religion now finds in flowers, evergreens and music its most appropriate voice and litany. And the result has been that from year to year there is poured into our holiday sermons more of the spirit of gladness, laughter and song.

Christmas is pre-eminently the festival of unselfishness. More than any other day, the hearts of the people are stirred by the angel anthem of peace and good-will. For the most part, those who observe other holidays propose to have a good time, but the true spirit of this day is to help others to have a good time. It is to all, old and young, rich and poor, the happy season of making and receiving gifts. What a pleasant spectacle it is to see the bulk of the population a few days before Christmas out on the streets, thronging shops and stores, purchasing gifts and keepsakes. Then the dignified President quits work and goes out shopping with his wife. Then Congress adjourns and grave Senators and distinguished members forget the Tariff and Silver bills and all other bills, and turn their attention to gift-making and other acts of kindness. The North and South cordially shake hands, and even capital and labor, wealth and poverty stop making faces at each other. In short, everybody is happy, or tries to be, and the business of the day is to give to every man and woman and child, however bowed down with cares, burdens and pain, a glimpse of the blue sky.

Let us be glad this is so. Life is full enough of sorrow and trouble at the best. Happy they who can even for a few fleeting moments dream, idealize, recall sweet memories and revel in rosy hopes. Surely it is good for us all to have a season when we may forget toil and strife, money and ambition, and yield to the fragrant influence of nobler and better sentiments. The American people are specially in need of such times of rest and recreation. They are a sad, nervous race upon whom work has come as a fate, and hangs as a pall over everything; the spontaneous joy and bubble of the heart is almost unknown, that well is fast drying up, and the wind that blows off the desert white with the bones of Mammon, poverty and insatiable thirst for more, has spread so far over our life, church and religion that a really happy man would be a curiosity.

But we should make it a point to remember Christmas, with its religious suggestions, its lessons of charity and brotherhood, its dear memories of long ago, its prophecies of the good time coming when the human race will reach the long-expected goal of happiness. Such thoughts may soften the asperities of life, sweeten the cup of affliction, and tend to restore the fading picture of innocence and ideal blessedness that have been withering in our arctic realism. Coming as Christmas does at the close of the year, when we are about to post the books of our successes or failures, it may serve to remind us that wealth and position are not all of life; that both combined may prove a curse, if not accompanied by the happiness that is the odorous flower of duty alone. In this spirit the PRESS tries to close the year, and wishes to its all patrons, friends, and enemies, if it has any, a Merry Christmas.

The Sacramento.

The merchants of Sacramento have become seriously alarmed over the danger to the Sacramento river. Yesterday Governor Waterman sent the following dispatch:

Hon. Leland Stanford, United States Senator, Washington, D. C.: The Sacramento river is in danger of changing its channel. There is a break two miles below the bridge which is 1000 feet wide. An immense bar is forming below the break across the river. As hydraulic mining has ceased, the appropriation of $250,000 in the hands of the War Department is available and ought to be used now to save the navigation of the river.

R. W. WATERMAN,
Sacramento, Dec. 18, 1889. Governor.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific States.

FOR WEEK ENDING DEC. 10, 1889.

417,208.—ADJUSTABLE STOVE GRATE—H. W. Bodeman, S. F.

416,893.—STAMP BATTERY—M. P. Boss, S. F.

417,143.—VEHICLE—S. P. Burdick, Oakland, Cal.

417,165.—PAPER FASTENER—H. A. Free, Vacaville, Cal.

417,180.—DRAFT HOOK—Geo. Harvey, Forrestville, Cal.

416,916.—GRAIN-CLEANER—Benj. Holt, Stockton, Cal.

417,185.—DREDGING APPARATUS — W. P. Humphreys, S. F.

417,186.—DREDGING APPARATUS — W. P. Humphreys, S. F.

417,187.—SUPPORT FOR DREDGING CONDUITS—W. P. Humphreys, S. F.

416,943.—CARRYING PULLEY—A. McLean, S. F.

417,197.—WATER-HEATER FOR GAS STOVES—J. H. McNutt, Alameda, Cal.

416,939.—OIL CAN—P. J. Moore, S. F.

416,942.—SUSPENDER BUCKLE—J. Myers, Eureka, Cal.

416,848.—ADVERTISING DEVICE FOR SHOW WINDOWS—C. E. Naylor, S. F.

416,950.—CONCRETE MIXER—E. L. Ransome, S. F.

416,863.—HOSE REEL—W. T. V. Schenck, S. F.

417,212.—CABLE-GRIP TURN TABLE—C. Scholz, Merced, Cal.

416,864.—HAIR-CLIPPING BENCH—E. Schroeder, S. F.

416,956.—COFFIN-FASTENER—J. H. Scott, S. F.

416,700.—EXTINGUISHING MERCURY—A. Sommer, Berkeley, Cal.

416,963.—SICKLE BAR—J. A. Sowell, Wheatland, Cal.

416,972.—SURF-POWER MACHINE — H. E. Thomas, S. F.

17,270.—TRADE-MARK — Pelton Water-Whee Co., S. F.

The following brief list by telegraph, for Dec. 18, will appear more complete on receipt of mail advices:

California—Grove S. Bartholomew, Garvanza, wellboring machine; John Bean, Los Angeles, spray nozzle; Augustus S. Cooper, Santa Barbara, electric stenographic pen; Willis G. Dodd, San Francisco, steam boiler furnace; Miles B. Dodge, San Francisco, dry-ore concentrator; Oscar H. Donley, San Jose, windmill; Patrick F. Donnlon, San Francisco, guard for cable-cars; Calvin Ewing, San Francisco, collar-stuffing machine; Samuel Guthrie, San Francisco, air compressor; Peter D. Horton, Nevada City, mail-pouch fastener; George E. Hoyt, San Francisco, collar-stuffing machine; Artemus A. Kent, assignor of half to H. C. Pfister and J. D. Stewart, San Jose, bit stock; Egmond B. Knapp and J. H. Cresmer, assignors to said Knapp, H. Cresmer and T. J. Brintos, San Jacinto, buckles; Leonard Leavin, San Francisco, tricycle; Henry L. Norton, Ukiah, and F. W. Cook, San Francisco, watchman's electric time detector, Henry Trenton, Oakland, machine for making slat and wire fencing; Joseph A. Stitch, Los Angeles, spoke socket; Gustave A. strueber, Oakland, assignor to himself and D. Rutherford, San Francisco, filter.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CASKET FASTENERS.—Joseph H. Scott, S. F. No. 416,956. Dated Dec. 10, 1889. This is one of those clasps or fasteners for coffins or caskets which are adapted for use in clamping and screwing the lid of the metallic shell which fits within the coffin or casket proper. The invention consists in the novel arrangement and construction of the fastener.

CONCRETE MIXING MACHINE. — Ernest L. Ransome, S. F. No. 416,950. Dated Dec. 10, 1889. This apparatus is designed to automatically measure and mix the ingredients which are employed in making concrete, and for other similar purposes, without the necessity of handling or considerable manual labor. The proportions may be graduated as nicely as desired and the whole work is done automatically.

GRAIN-CLEANER.—Benjamin Holt, Stockton. No. 416,916. Dated Dec. 10, 1889. This is an improved grain-cleaner, which is specially applicable for use upon thrashing machines, but may also be used for a separate and independent cleaner when necessary. It consists essentially of a device for producing a shaking motion of the shoes which carry the screens and a means for regulating and adjusting the shake.

SICKLE BAR FOR HARVESTERS. — John A. Sowell, Wheatland, Yuba Co. No. 416,963. Dated Dec. 10, 1889. The object of this attachment is to provide a simple attachment of the sickle guards or fingers to the bar—one which will not work loose and may readily be applied. The shanks or stems of the guards are made much heavier than if they had to pass through holes in the bar, for in the form adopted they can project from their seats as much as may be required for the proper strength, and, being underneath, they will not be in the way.

CARRYING PULLEY.—Anthony McLean, S. F. No. 416,943. Dated Dec. 10, 1889. This improved construction of pulleys is specially adapted to pulleys which are employed to carry a rope in the tube or channel of a cable railway and for other similar purposes. The peripheries of these pulleys are rapidly worn by the friction of the traveling rope, and when they are worn through it is necessary to throw away the whole of the pulley. As a great number of these pulleys are used on cable-railway lines, the loss is considerable. This invention, which is designed to remedy this difficulty, consists in the casting of the rim of the pulley of chilled or white iron, and the spider or center and hub may be made separately and removable, so as to be placed in a new rim when the old one is worn out.

AIR-BRAKE RELIEF VALVE.—Abbie P. Hanscom, S. F., executrix of W. W. Hanscom, deceased, assignor of H. D. Bacon, Oakland. No. 416,603. Dated Dec. 3, 1889. This invention relates to certain improvements in air-brake mechanism for railway trains, and it consists of a relief valve in connection with each of the brake-cylinders, whereby the air which is released from one end of the brake-cylinder when the brakes are to be put on, is allowed to escape instantly without passing back through the train-pipe to the engine. The present invention is especially applicable to a brake-mechanism in which no storage or train-reservoirs are used, and for which a patent was issued to W. W. Hanscom, Sept. 22, 1885.

GRAIN SEPARATOR AND CLEANER.—Michael N. Laufenburg, Stockton. No. 416,464. Dated Dec. 10, 1889. This is an apparatus for more perfectly operating and cleaning grain, and it consists of an oscillating-shoe with screens upon which the grain is delivered by the carrier, which transmits it from the thrashing-cylinder, a superposed carrier by which the principal part of the straw is separated from the grain and carried away, and, in combination with the screens, of a blast and a series of backwardly inclined plates or shutters by which the chaff and straw are prevented from falling through the grain and through which the blast from the fan is directed so as to discharge the chaff and straw and assist in separating them from the grain.

AUTOMATIC PRESSURE RETAINING VALVE FOR AIR BRAKES.—Thos. P. Sweeney, Sacramento. No. 416 516. Dated Dec. 3, 1889. This is an automatic pressure-retaining valve for air-brakes which may be operated in connection with the reservoir of an automatic brake-mechanism and with connecting pipes of the same so that in running down heavy grades the brakes can remain applied while the reservoir is being replenished. In the employment of automatic car brakes an auxiliary reservoir is fixed on each car having a valve mechanism which is called a triple valve through which air is admitted to the reservoir and by which it is also admitted from the reservoir to the brake cylinder by the reduction of pressure in the train pipe; but when it is necessary to replenish the auxiliary reservoir it is necessary to temporarily cut off the communication between this reservoir and the brake cylinder so that the latter is without pressure while the reservoir is being replenished and the movement of the valves to connect the reservoir with the train pipe allows the air to escape from the cylinder. When this occurs upon heavy downgrades, it is a dangerous thing, because the train will gain such great momentum in a short distance that it will be almost impossible to handle it and again check it. This invention is designed to overcome this difficulty and it consists in the employment of what the inventor terms a "pressure-retaining valve," which regulates or prevents the escape of air from the brake cylinder while the train reservoir is being replenished.

Meetings and Elections.

Annual meetings and elections have been held by the following mining companies:

GOULD AND CURRY M. CO., Dec. 16. Directors—G. R. Wells (president), C. H. Fish (vice-president); Morris Hoeflich, George Frier, Robert Sherwood and H. Zadig, trustees; A. K. Durbrow, secretary; Nevada bank, treasurer; and P. Kerwin, Sup't. The financial statement showed that there was $20 006 on hand. Sup't Kerwin's annual report showed that there has been worked at the Thompson mill 250 tons of ore at a cost of $600 per ton, which yielded bullion of a total value of $3381.39, or an average yield of $13.52½ per ton. The bullion carried $1039.17 in go.d and $2342.22 in silver.

MT. DIABLO M. CO., Dec. 17. The trustees and officers were re-elected as follows: W. E. Norwood, president; J. M. Shotwell and J. N. Knowles, vice-presidents; with G. W. Grayson and R. W. Heath forming the board of trustees; R. W. Heath, secretary; and W. H. Shockley, Sup't. The financial statement showed an overdraft of $3976.47, against which there is unsold bullion on hand valued at $10,708.25.

LOCOMOTIVE M. CO., Dec. 7. H. B. Havens, president; T. F. Fish, vice-president; David Hunter, L. C. Frazer, trustees; A. H. Fish, secretary; Pacific bank, treasurer; and Isaac D. Smith, Sup't. The financial statement showed a balance on hand of $1935.35.

ANDES M. CO., Dec. 18. J. W. Brown, president; M. W. Fox, vice-president; and William A. Lyle, M. P. Hall and Walter Turnbull, directors. J. J. E. Hawkins was re-elected secretary, and his financial report showed a credit of $14,728. The receipts and disbursements for the year showed a gain over 1888 of $12,947.

OPHIR M. CO., Dec. 18. Charles H. Fish, president; A. W. Havens, vice-president; Morris Hoeflich, Con O'Connor, Wm. S. Lyle, George R. Wells and Herman Zadig, directors. E. B. Holmes was re-elected secretary, and D. B. Lyman Sup't. The secretary's financial statement showed a credit of $8946.

THE big sugar refinery of Claus Spreckels in Philadelphia has been started up.

The Benton Consolidated Mine.

EDITORS PRESS:—What was the last annual dividend of the "Benton"? The PRESS did not give the amount at the time of publication. By giving me this information, you will place me under obligations. A. H. K.

Barstow, Inyo.

The Benton Consolidated never paid a dividend, but it has levied several assessments, the last one on October 29, 1888, being $1 per share. The mine has money on hand, but is doing nothing as yet to develop the property. They are evidently waiting development work going on in adjoining mines.

The company this week began suit against R. N. Graves, W. S. Wood, Wm. M. Hoag, W. F. Myerd, W. H. Watson, E. Miller, C. Darby and W. S. Wood as executor of the estate of Seth Cook, deceased, praying that defendants be adjudged guilty of fraud and to recover $500,000 with interest from July 25, 1886. The action is based upon a claim of the company against the estate of Cook for alleged fraudulent conversion of 56,735 shares of the stock of the plaintiff corporation, which shares were duly bid in by the corporation on the 21st of October, 1885, for assessment No. 14 of 10 cents per share of the value of $340,000, to which add $79,333 interest, makes a total of $419.333. Also, for the fraudulent conversion of 26,865 shares of the corporation stock bid in by the corporation March 30, 1886, for assessment No. 15 of 10 cents per share of the value of $160,000, to which add $37,333 interest, making a total of $197,444. It is charged that this stock, aggregating 83,600 shares, through a fraudulent combination between the defendant members of the Board of Directors of the corporation and said Cook, and with intent to defraud and cheat the corporation and stockholders thereof, was fraudulently transferred and delivered by the said directors between May 1, 1886, and July 25, 1886, to said Cook, or his order, and which he appropriated to his own use and benefit, to the damage of the corporation, in the sum of $500 000, together with interest, making a total of $616,666.

The Pelton Water-Wheel Company.

The business of the Pelton Water-Wheel Co. has increased so rapidly during the past year that their resources have been severely taxed to fill orders with any degree of promptness. The necessity, therefore, of larger and more commodious quarters has for some time been apparent. A new and substantial brick shop, with some 7000 feet of floor space, has recently been constructed by this company, and equipped with the best grade of tools and most modern appliances for their work, giving them great facility for meeting the demands of a trade that has already assumed large proportions.

The popularity of the Pelton wheel is based upon extraordinary merit and wide adaptation to varying conditions, and the rapidly increasing demand for them from all parts of the world indicates that this will soon become one of the large industrial establishments of the country. Their present address is 121–123 Main street, San Francisco, Cal.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, department 10, San Francisco:

CONSUMERS' ICE CO., Dec. 17. Capital stock, $100 000. Directors—E. J. Baldwin, R. G. Sneath, N. P. Williams, F. H. Green and F. Dillingham.

CALIFORNIA EDUCATIONAL ASS'N, Dec. 17. Object, to establish an educational library. Capital stock, $250.000. Directors—Ira G. Hoitt, James Denman, J. B. McChesney, Jas. T. Hamilton, Ira Moore, Geo. R. Kleeberger, Jas. W. Anderson, Fred M. Campbell and Horace Davis.

ROSEDALE RAISIN VINEYARD CO,, Dec. 17. Capital stock, $32,000. Directors—Jas. L. Barker, S. W. Fergusson, M. M. O'Shaughnessy, R. Friselle and N. J. Bird.

PACIFIC TIMBER, RAFT & MILL CO., Dec. 17. Object, to construct timber rafts in the waters of Puget Sound and tow them to favorable points on the Pacific Coast for sale. Capital stock, $2,000,000. Directors—H. R. Robertson, Chas. J. Haggerty, H. C. Wyman, Wm. Madden and W. B. Wilshire.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

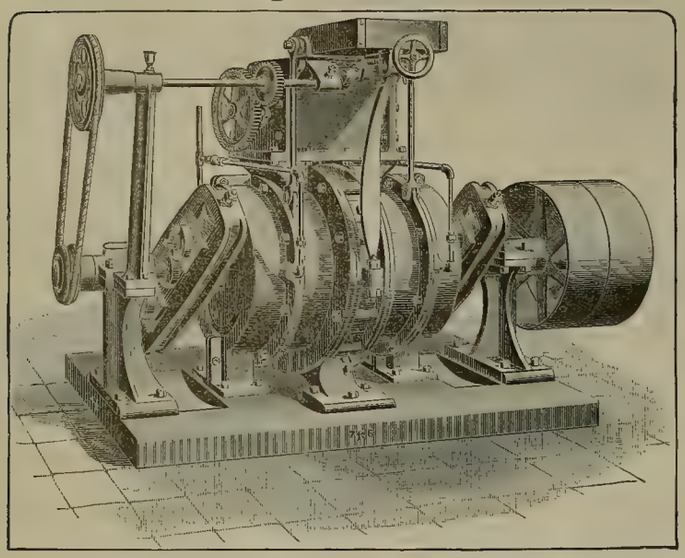
J. C. HOAG—San Francisco.
R. G. BAILEY—San Francisco.
M. D. SHRADER—Santa Clara Co.
W. W. THEOBALDS—Los Angeles Co.
E. FISCHER—Central California.
GEO. WILSON—Sacramento Co.
E. H. SCHABFFLE—Fresno Co
C. EDWARD ROBERTSON—Humboldt Co.
FRANK S. CHAPIN—Butte and Yuba Cos.
WM. H. HILLEARY—Oregon.
E. E. DEMING—Oregon.

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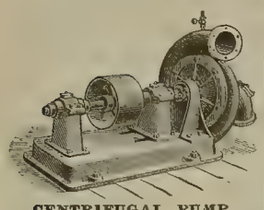
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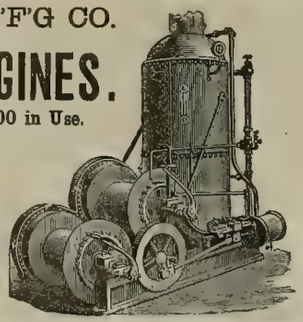


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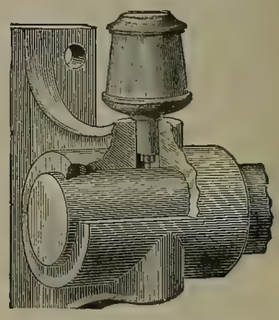
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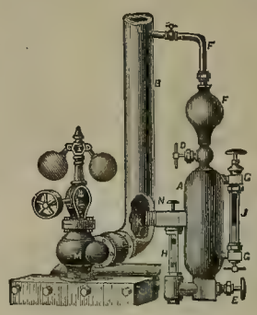
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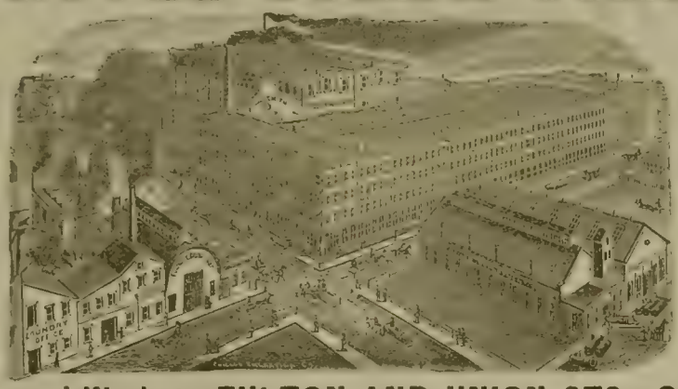
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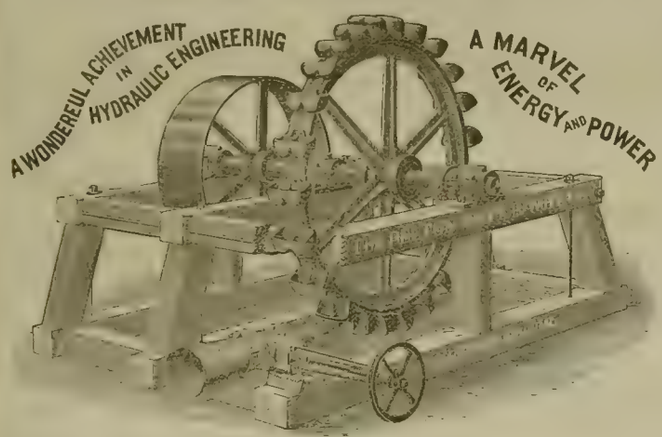
General Offices and Works: FULTON AND UNION STS., CHICAGO, ILL.

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SOLE WESTERN AGENTS FOR TYLER WIRE WORKS DOUBLE CRIMPED MINING CLOTHS.

THE PELTON WATER WHEEL

GIVES THE HIGHEST EFFICIENCY OF ANY WHEEL IN THE WORLD.



OVER 800 ALREADY IN USE.

Affords the Most Simple and Reliable Power for all Mining and Manufacturing Machinery.

Adapted to heads running from 20 up to 2,000 feet.

From 12 to 20 per cent better results guaranteed than can be produced from any other Wheel in the Country.

ELECTRIC TRANSMISSION.

Power from these Wheels can be transmitted long distances with small loss, and is now extensively used in all parts of the country for generating both power and light.

APPLICATIONS

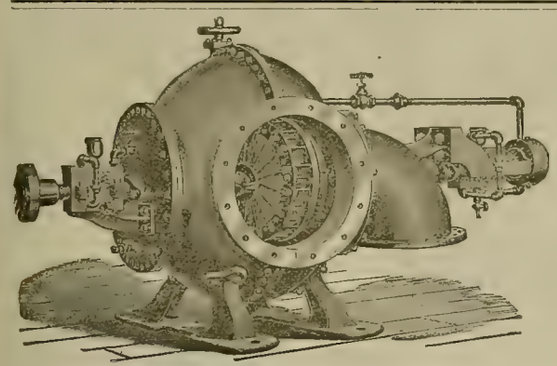
Should state amount, and head of water, power required, and for what purpose; with approximate length of pipe; also, whether the application is with reference to *Wheels* or *Motors* described below. SEND FOR CIRCULARS.

The Pelton Water Wheel Co.

121 MAIN ST., SAN FRANCISCO, CAL.

PELTON WATER MOTORS.

Varying from the fraction of 1 up to 15 and 20-horse power. Unequaled for all light-running machinery. Warranted to develop a given amount of power with one-half the water required by any other. ☞ SEND FOR MOTOR CIRCULAR. ADDRESS AS ABOVE. ☜



JAMES LEFFEL'S Mining Turbine Water Wheel.

These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

JAMES LEFFEL & CO.,

Springfield, Ohio, or 110 Liberty St., New York.

FRASER & CHALMERS, General Agents, Chicago, Ill., and Denver, Col.

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CALIFORNIA IRON YARD.

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Successors to CHAS. CALLAHAN

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SECOND-HAND BOILERS AND OLD MACHINERY

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BULLION ROOMS and ORE FLOORS,

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Standard Shot-Gun Cartridges,

Under Chamberlin Patent.

JOHN TAYLOR & CO.,

IMPORTERS AND DEALERS IN

ASSAYERS' MATERIALS, MINE AND MILL SUPPLIES,

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63 & 65 First St., cor. Mission, San Francisco.

We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price. Our New Illustrated Catalogue, with prices, will be sent on application.

☞ Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the **Morgan Crucible Co.**, London, England. Also for **E. G. Denniston's** Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices.

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Nevada Metallurgical Works.

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Near First and Market Streets, S. F.

C. A. LUCKHARDT, Manager. ESTABLISHED 1869

Ores worked by any Process.

Ores Sampled.

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Analyses of Ores, Minerals, Waters, etc.

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Plans and Specifications furnished for the most suitable Process for Working Ores.

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Best and Cheapest in America.

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I have a large supply of Battery Screens on hand suitable for the Huntington and all Stamp Mills, which I will sell at 20 per cent discount.



PERFORATED SHEET METAL

For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass. Zinc and other metals punched for all uses.

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Mining Screens a specialty, from No. 1 to 15 (fine).

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21 & 223 First St., San Francisco, Cal.

JOHN W. QUICK, Proprietor.

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Dec. 19, 1889.

General trade the past week was good for the season of the year. Among machinists and foundrymen, fair orders are being executed. The general feeling is quite hopeful for the coming year.

The local money market is unusually close, much more so than at the close of 1888. It is claimed by some that it is purposely done for stock speculative purposes. Taxes and other payments both in this and the succeeding month are arranged for, so that with the remittances coming in, the artificial tightness ought to give way.

The foreign commerce of the United States for the first ten months of the year compares as follows:

	1888.	1889.
Exports merchandise	$529,624,851	$636,332,533
Exports specie	44,918,335	83,088,916
Total exports, 10 months	$574,543,186	$719,421,449
Imports merchandise	$610,947,684	$650,950,094
Imports specie	20,098,700	24,164 509
Total imports, 10 months	$631,046,388	$675,114,603
Balance of trade	$ 56,503,202	$ 44,306,846

This shows a balance of trade in favor of this country for the current year up to the 1st of November of over forty-four millions, against an adverse balance of over fifty-six millions for the same period of the previous year.

The steamer Gaelic hence for Hongkong on last Saturday took out the following treasure: Silver bullion for Calcutta, $139,000; for Hiogo, $101,000; total, $240,000. Mexican dollars for Hong Kong, $194,393; gold-dust, $16; and gold coin, $7434.

MEXICAN DOLLARS—The market has ruled more quiet and at easier prices. Closed at 77c bid and 77¼@77¾c asked.

SILVER—The market abroad has eased off, causing a weaker feeling and lower prices with us. English exchanges coming to hand warrant the assertion that President Harrison's adverse silver views have had considerable to do in depressing values. To this has been added the early adjournment of Congress and there not being a possibility of any action being taken on the silver question prior to next March or April. The balance of trade, as given above, is also against silver, for it shows that it is growing in favor of this country, which means low exchange and the importation of coin. Of necessity Europe will have to draw silver, but in the absence of any active, commercial demand for exchange purposes there will not be that keen buying competition which would otherwise obtain. We still adhere to the opinion that silver is good property, for its production in this country and in the world at large is not increasing; whereas the production of gold is increasing quite rapidly. Sales in our market have fallen from 96¼c last Thursday to a nominal quotation of 95¼c yesterday, with buyers indifferent. London cables came through to-day 1-16d higher.

QUICKSILVER—The market is without any particular change. The large deposits of snow assure a liberal supply of water in the mining districts which encourages the opinion of a large demand in 1890 for quicksilver. There was shipped in last month by the Southern Pacific railroad 151,730 lbs.

Receipts of quicksilver the past week aggregate 296 flasks.

BORAX—Receipts the past week aggregate 1235 ctls. In last month there was shipped Eastward by the Southern Pacific railroad 325,390 lbs. The market continues steady under a free inquiry from the East.

LIME—Receipts the past week aggregate 1727 bbls. The market is still dull and easy.

TIN—The market is heavy for spot, with $5 being the last quoted sale for plate. For prompt shipment it is impossible to execute orders below $5.50.

COPPER—Notwithstanding we are large producers of copper, yet 24 ingots came to hand the past week from New York. The market has been gradually settling abroad under free offerings and consumers asking for concessions. The situation is strong for the holding interest, provided prices are not unduly inflated so as to encourage larger production, as the visible supplies are being steadily reduced.

IRON—From Irondale 274 tons came to hand the past week. The higher market has stimulated the production on this coast. The market is dull and inactive, but holders are not willing to make concessions with foreign markets so active and strong.

COKE—Imports the past week aggregate 517 tons from Newcastle, England. The market appears to be well stocked, with no demand of any moment reported. To sell, concessions would have to be made.

COAL—Imports the past week aggregate as follows: From Seattle, 545 tons; Departure Bay, 2260; Nanaimo, 1113; Overland, 40; Coos Bay, 450; Irondale, 235; total, 4643 tons. The spot market is barely steady. Two cargoes of Australian on spot were closed out at $7, their buyers agreeing to have the vessels unloaded quickly and within a certain stipulated time, so as to save the vessels' outward charters. For cargoes near at hand the demand is light, but for prompt shipment there is some inquiry; but shippers' high views do not lead to much business. The high rates for outward charters from Australian ports are against buyers of coals. In coast coals the market is essentially unchanged.

LEAD—In lead there is nothing new to report.

THE secretary of the Caledonia mine of Dakota gives as a reason for the suspension of dividends the fact that the ore on the 400 foot level has fallen from an average of $4 to $3 per ton. Comstock companies cease paying dividends when the grade of ore falls below $25 per ton.

Eastern Metal Markets.

By Telegraph.

NEW YORK, Dec. 19, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	44 1-16	95½	$13 90	$3 90	$21 35
Friday	44	95½	14 00	3 90	21 35
Saturday	44	95⅝	14 00	3 90	21 35.
Monday	44	95½	13 90	3 85	21 30
Tuesday	43⅞	95½	13 75	3 90	21 25
Wednesday	43⅞	95	13 75	3 87½	21 25

NEW YORK, Dec. 18.—California refined borax is quoted at 8⅝@9c. Quicksilver is barely steady. Copper less animated; prices regarded above the free consumptive. Buying too high for speculation. Lake Ingot, $14@$14.50; sold well ahead. Electro grades, $13@13.25; common casting, $12.75. London spot bars, £49 17s 6d; future, £49 10s. Pig lead, no movement of note. Free offering, $3.85 @3.90.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, December 19, 1889.

ANTIMONY	25 @	—
BORAX—Refined, in carload lots	7¼@	7⅞
Powdered " " "	7¾@	—
Concentrated " " "	— @	6¾
All grades jobbing at an advance.		
COPPER—		
Bolt	21 @	22
Sheathing	22 @	24
Ingot, jobbing	17 @	18
do, wholesale	15 @	16
Fire Box Sheets	22 @	24
LEAD—Pig	4½@	4¾
Bar	5 @	—
Sheet	7 @	—
Pipe	6 @	—
Shot, discount 10% on 500 bags Drop, ₩ bag.	1 45 @	—
Buck, ₩ bag	1 65 @	—
Chilled, do	1 85 @	—
STEEL—English, lb	16 @	20
Canton tool	9 @	9
Black Diamond tool	9 @	9
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4½@	—
TINPLATE—B. V., steel grade, 14x20, P. S	5 50 @	—
B. V., steel grade, 14x20, spot	4 95 @	5 10
Charcoal, 14x20	6 75 @	7 00
do roofing, 14x20	5 50 @	—
do, do, 20x28	11 00 @	—
Pig tin, spot, ₩ lb	23 @	25
COKE—Eng., ton, spot, in blk	13 50 @	15 00
Do, do, to load	16 00 @	—
QUICKSILVER—By the flask	47 50 @	—
Flasks, new	@	—
Flasks, old	35 @	—
CHROME IRON ORE, ₩ ton	10 00@	—
IRON—Bar, base	3 @	3½
Refined	4½@	5½

IRON	Spot.	To Load.
Glengarnock ton	35 00 @ —	34 @ —
Eglinton, ton	35 00 @ —	32½@ —
American Soft, No. 1, ton	— @35 00	32½@ —
Oregon Pig, ton	— @35 00	— @ —
Clay Lane White	— @28 00	27½@ —
Shotts, No. 1	35 00 @35 00	32½@ —
Bar Iron (base price) ₩ lb	@	@ —
Langloan	35 00 @ —	34 @ —
Thorncliffe	35 00 @ —	34 @ —
Gartsherrie	35 00 @ —	34 @ —

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$20 00	$17 00
41 to 50 ft	21 00	18 00
51 to 60 ft	23 00	20 00
61 to 70 ft	27 00	21 00
1x3, fencing	22 00	19 00
1x4, "	21 00	18 00
1x3, 1x4 and 1x6, odd lengths	19 00	16 00
Second quality	17 00	15 00
Selected	24 00	22 00
Clear, except for flooring	31 00	28 00
Clear for flooring	2 00	.....
Clear V. G. No. 1 flooring	6 00	.....
Fir wood	14 00	10 00
Dressed Pine, flooring, No. 1, 1x6	32 00	29 00
No. 1, 1x4	34 00	30 00
No. 1, 1¼x4, 1¼x6, and odd sizes	37 00	33 00
All sizes, No. 2	27 00	24 00
Stepping, No. 1	44 00	35 00
Stepping, No. 2	34 00	25 00
Ship timber and plank, rough	27 00	18 00
Selected, planed 1 side, av'ge 40 ft	29 00	24 00
" " 2 " " "	31 00	26 00
" " 3 " " "	33 00	28 00
" " 4 " " "	35 00	30 00
Deck plank, rough, average 35 ft	35 00	32 00
Dressed, average 35 feet	40 00	35 50
Pickets, rough, B. M	20 00	16 00
1x1½, 4 ft long, ₩ M	6 50	5 00

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	7 75 @ 8 00	Cardiff	9 50@10 00
Liverpool St'm	8 50 @— —	Lehigh Lump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	9 00 @ 9 00	Egg, hard	16 50@16 00

SPOT FROM YARD.

Wellington	8 9 00	Seattle	7 00
Scotch Splint	9 00	Coos Bay	6 00
Greta	9 00	Cannel	12 00
Westminster Brymbo	9 00	Egg, hard	18 00
Nanaimo	9 00	Cumberland, in sacks	19 00
Sydney	8 00	do, bulk	18 00
Gilman	7 0		

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Germania, Dec. 10, $4461; Hanauer, 10, $3350; Crown Point, (for November) $33,939; Chollar, for November) $21,934; Mt. Diablo, Dec. 13, $5440; Hanauer, 11, $3550; Crocker, 14, $6000; Con. Cal. and Virginia, 14, $45,000; Savage, 14, $9232; Hale and Norcross, 14, $21,500; Overman, 14, $6856; Con. Cal. and Virginia, 19, $52,524; Hanauer, 18, $4350; Young America, Sierra county (for November), $23,000; Mt. Diablo, 19, $7938.

STANDARD HOISTING MACHINERY. — Mr. F. E. Rainier, General Manager of the Western Branch House of the Lidgerwood Manufacturing Company, N. Y., which is located at 34 and 36 West Monroe street, Chicago, Ill., reports a brisk demand throughout the West for the company's Standard hoisting machinery. Business with this pushing concern has been universally good for some time past, and there is every prospect of it continuing so.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Belle Isle M Co	Nevada	13	15	Dec 4	Jan 8	J W Pew	310 Pine St
Bullion M Co	Nevada	35	25	Dec 4	Jan 24	R R Grayson	327 Pine St
Bodie Con M Co	California	11	25	Nov 11	Dec 17	E L Burling	309 Montgomery St
Booth G M Co	California	4	2	Nov 23	Dec 28	Jan 20 Geo R Spinney	310 Pine St
Con Imperial M Co		26	5	Nov 22	Dec 27	Jan 15 J L McCoy	329 Pine St
Con New York M Co	Nevada	2	15	Dec 11	Jan 15	Feb 5 C E Elliott	309 Montgomery St
Calaveras Blue Gravel Co	California	4	3	Nov 15	Dec 23	Jan 14 B Burris	240 Montgomery St
California State Co	California	5	25	Oct 21	Nov 26	Dec 23 J O Hanson	9 Mission St
Con Pacific M Co	Cabfornia	11	10	Nov 1	Dec 5	Dec 28 F R Luty	330 Pine St
Chollar M Co	Nevada	28	50	Nov 1	Dec 4	Dec 24 C E Elliott	309 Montgomery St
Del Monte M Co	Nevada	2	20	Oct 28	Dec 3	Dec 26 J W Pew	310 Pine St
Exchequer M Co	Nevada	28	25	Dec 16	Jan 21	Feb 11 C E Elliott	309 Montgomery St
Gray Eagle M Co	California	15	6	Oct 16	Nov 18	Jan 4 J M Buffington	303 California St
Grand Prize M Co	Nevada	23	30	Nov 21	Dec 24	Jan 15 R R Grayson	329 Pine St
Kentuck M Co	Nevada	20	30	Dec 11	Jan 14	Feb 4 J W Pew	310 Pine St
Livermore Coal M Co	California	1	50	Nov 16	Dec 19	Jan 4 G C Higgins	120 Sutter St
Mono G M Co	California	29	25	Nov 18	Dec 23	Jan 24 B L Burling	309 Montgomery St
North Occidental G & S M Co	Nevada	11	7	Dec 2	Jan 6	Jan 27 W H Watson	302 Montgomery St
North Gould & Curry M Co	Nevada	11	20	Nov 6	Dec 7	Dec 27 C H Mason	331 Montgomery St
Nevada Queen M Co	Nevada	6	20	Oct 31	Dec 4	Dec 30 H Deas	309 Montgomery St
Palisade M Co	Nevada	2	5	Nov 1	Dec 26	Jan 20 D Buck	309 Montgomery St
Platt & Gilson G M Co	California	4	3 00	Nov 13	Dec 20	Jan 6 C Herrmann	326 Kearny St
Russell Reduction & M Co	California	5	5	Nov 11	Dec 16	Jan 8 J Morizio	328 Montgomery St
Savage M Co	Nevada	74	50	Nov 5	Dec 10	Dec 30 E B Holmes	309 Montgomery St
Summit G M Co	California	11	5	Nov 14	Dec 20	Jan 14 B L Burling	309 Montgomery St
Trinity River Tunnel & M Co	California	2	50	Nov 27	Jan 6	Jan 18 L H Pockman	28 California St
Teirakoff M Co	California	3	1	Dec 14	Jan 21	Feb 14 W J Garrett	308 Pine St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Alaska M Co	California	A T Corbus	420 Montgomery St	Annual	Dec 30
Combination M Co	Arizona	A Waterman	309 Montgomery St	Annual	Dec 26
Con St Gothard M Co		J Wetzell	522 Montgomery St	Special	Dec 24
Jupiter Gravel M Co	California	W A Keefer	14 Grant Ave	Annual	Dec 21
Ontario M Co	Utah	C Stamp	309 Montgomery St	Annual	Dec 21
Peer M Co	Arizona	A Waterman	309 Montgomery St	Annual	Dec 26
Peerless M Co	Arizona	A Waterman	309 Montgomery St	Annual	Dec 26
Weldon M Co	Arizona	A Waterman	309 Montgomery St	Annual	Dec 26

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	AMOUNT.	PAYABLE
Champion M Co		T Wetzel	522 Montgomery St	10	Nov 25
Caledonia M C	Nevada	A S Cheminant	328 Montgomery St	08	Aug 5
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	Dec 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	Aug 25
Idaho M Co	California		Grass Valley	5 00	Nov 7
Mt Diablo M Co	Nevada	R Heath	319 Pine St	30	Oct 21
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Nov 10

Mining Share Market.

The mining share market has been quite active, but with prices on the down grade up to Tuesday, when a steadier tone set in, resulting in a slight recovery on yesterday (Wednesday). The decline in the Comstocks was most admirably engineered by at first destroying confidence by false reports, both printed and circulated from mouth to mouth. Patrons of this paper were prepared for the low prices, but while being advised of it they were also given correct information from the mines which did not warrant the low prices, but, on the contrary, a much higher range. It is to be feared that when outside buyers are induced to again come into the market so as to take the cheaply bought stock off insiders, they will, under keen buying, run prices up higher than the situation will warrant, which will, if done, entail heavy losses. In outside stocks the trading was light up to yesterday, when the Tuscaroras and Quijotoas showed more activity at better prices. In the Bodies, Mono broke to 5 cents, Bulwer to 10, but Bodie was unchanged.

The decline in the market the past week brought in large lines of margined stock, besides considerable paid-up stock thrown out by frightened outsiders. Not an opportunity has been missed or "a stone left unturned" to frighten holders into letting go of their stock. So bad did the market look that some brokers refused to carry stock on a margin.

Several large brokers in the San Francisco Board have recently refused to give proxies for election purposes. They very properly think that mine-managers should own a majority of the stock. This is the right view to take and outside holders will do well by confining their trading with the brokers who believe that the control of a mine should only be vested in those who own the majority of the stock. If this is done in the future there will be less need for the cry of "steals."

Present indications point to Crown Point's bullion production for this month aggregating over $60,000; Chollar's over $40,000, Savage's about $40,000, and Hale and Norcross' about $80,000. The financial standing of the above and other bullion-producing mines on the first Monday in next month will be the best for several months, but the standing of several of the other mines will be very bad.

A correspondent is informed that because Captain John Kelly is here about all the time it is no reason for supposing that the Bodie mines are located in this city, for the Captain may find the climate healthier here than is that with miners who may be disappointed over present results. In this connection it may not be amiss to remind the managers of the Comstock mines that salaried superintendents could put in their time to better advantage on the Comstock than either in looking after mines elsewhere or having a good time in this city.

The stock market opened this (Thursday) morning barely steady, with outsiders either realizing or else selling some of their holdings so as to prepare themselves against a reported break in the market. The outside stocks were steady.

Reliable private information from the mines is hard to get, but all that is obtainable confirms previous advices of the important character of the work going on in the North End and Gold Hill mines. Unless work is stopped, development ought to be made soon in one or two of the Gold Hill mines. A report is current in well-informed circles of a strike in Mexican, and an improvement in Ophir. Official letters received to-day from several of the Gold Hill mines are not of much importance outside of Crown Point's, in which mine, on the 300-foot level, they report still being in good ore, but the extent is not yet known. This same ore was reported in last week's official letter. The pumping out of the Gold Hill mines will be started at an early day in next month. At the annual election of Opbir and Andes the superintendents of the two mines spoke very encouragingly of the prospects of finding a body of good paying ore. A great deal of active and interesting work has been done in Andes. From the outside mines nothing is obtainable outside of official advices.

THE *Central Nevadan* says the Blanco Mining Co. at Galena, Nev., whose mill was burned last fall, has decided to build a new mill. A. G. Higbee left for New York Wednesday to consult with the directors regarding the matter.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov. 26		WEEK ENDING Dec. 4.		WEEK ENDING Dec. 11.		WEEK ENDING Dec. 18.	
Alpha	1 30	1.40	1.10	1.25	1.05	1.15	.75	1.05
Alta	2.00	2.15	1.60	2.00	1.15	1.70	1.10	1 30
Andes	....	....	.45	.55	.45	....	.30	.40
Belcher	2.60	2.95	2.40	2.65	2.15	2.45	1.60	2.10
Best & Belcher	3.10	3.40	2.80	3.15	2.20	2.9	2.25	2.65
Bullion	.65	.65	....	....	.40	.60	.40	.45
Bodie Con	.60	....	.45	.55	.50	.55	.60	.70
Benton	4.50	....	5.00	....	4.00	....	....	....
Bulwer	....	....	....	....	....	....	.15	....
Commonwealth	3.00	....	2.80	3.10	3 00	3.10	3.00	3.10
Con. Va. & Cal	6.00	6.50	5¾	6¾	5	6¾	4.75	4.95
Challenge	1.90	2.25	1.60	1.8	1.35	....	1.05	1.35
Chollar	1.55	1.75	1.55	2.10	1.95	2.50	2 05	2.60
Confidence	4¾	5¾	4.30	4.35	....	4¾	3.80	4.10
Con. Imperial	.30	.35	.25	.30	.25	....	....	.20
Caledonia	....	....	.15	.20	.15	....	.15	....
Crown Point	2.50	2.70	1.90	2.55	1.65	2.15	1 35	1.70
Crocker	.30	....	.25	....	.25	....	....	.25
Eureka Con	4.00	....	....	....	....	....	3.10	3.20
Exchequer	....	....	.50	....	.35	.55	25	.40
Grand Prize	.45	.60	.45	.55	.40	.60	.35	.40
Gould & Curry	1.65	1.85	1.60	1.75	1.50	1.6	1.30	1.50
Hale & Norcross	2.90	3.10	2.75	3.00	2.70	2.90	2.30	3.30
Julia	.35	.40	.35	.35	.30	....	.30	.35
Justice	1.75	....	1.50	1.65	1.40	1.50	1.25	1.45
Kentuck	....	....	.85	.85	.60	.70	.35	.55
Lady Wash	.40	....	.30	.40	.25	.30	.25	....
Mono	....	3.75	.35	....	....	....	....	.15
Mexican	3.10	....	2.80	3.20	2.60	2.95	2.20	2.65
Navajo	.25	....	.30	....	.25	.30	.30	....
North Belle Isle	1.15	.75	1.00	1.15	.90	1.20	1.00	1.20
Nev. Queen	.70	1.30	.70	.80	.75	.85	.80	1.00
Occidental	1.15	4.50	1.05	1.05	.75	.55	.60	.70
Ophir	4.00	1.00	3.75	4.20	3.65	3.90	3.00	3.60
Overman	.95	1.90	.80	.95	.70	....	50	.70
Potosi	1.70	....	1.70	1.80	1.70	2.20	1.75	2.25
Peerless	.30	....	.20	.25	.25	....	.20	.35
Peer	....	1.55	....	....	.15	....	.10	....
Savage	1.40	1.55	1.25	1.50	1.30	1.85	1.40	1.80
Sierra Nevada	1.30	2.75	1.10	1.60	1.05	1.15	1.05	1.05
Silver Hill	.40	....	.35	....	.35	....	.25	.30
Scorpion	.25	....	....	....	....	....	.10	.15
Union Con	2.90	3.45	2.80	3.15	2.55	2.80	2.10	2.55
Utah	.70	.90	.75	.85	.65	.80	.50	.70
Weldon	.15	....	....	....	....	....	....	....
Yellow Jacket	2.75	2.95	2.40	2.80	2.25	2.45	1.75	2.20
	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY, Dec. 19, 9:30 A. M.

100	Alta	1.25	100 Lady Wash 30c
50	Alpha	1.00	400 Mexican 2.50
100	Andes 30c		10 Mono 40c
300	Belcher 1.90		300 N. Belle Is 1.20
100	Best & Belcher 2.50		500 N. Commonwealth 80c
300	Belcher 1.90		400 Occident 65c
50	B. & Belcher 2.50		530 Overman 65c
100	Bulwer 15c		100 Opbir 3 30
200	Bullion 35c		300 Potosi 1.90
500	Chollar 2.30		100 Peer 15c
200	Commonwealth 3.00		1000 Peerless 30c
50	Confidence 3.25		150 Savage 1.55
400	Crown Point 1.70		100 S. B. & M 90c
300	Con Imperial 25c		500 Union 2.25
390	Con Va & Cal 4.50		500 W Comstock 20c
200	Hale & Nor 2.45		200 Weldon 15c

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Assessment Notices.

Booth Gold Mining Company. Location of principal place of business, San Francisco, California.

Location of Works, Auburn, Placer Co., Cal.

NOTICE is hereby given that, at a meeting of the Board of Directors, held on the 23d day of November, 1889, an Assessment, No 4, of Two(2) Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin, to the Secretary, at the office of the Company, No. 310 Pine Street, Room No. 28, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of December, 1889, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the 20th day of January, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

GEO. R SPINNEY, Secretary,

Office, No. 310 Pine Street, Room No. 28, San Francisco, California.

DELINQUENT SALE NOTICE.

Gray Eagle Mining Company, Location and principal place of business, San Francisco, California. Location of Works, Placer Co., Cal.

NOTICE.—There are delinquent upon the following described Stock, on account of Assessment (No 15), levied on the 16th day of October, 1889, the several amounts set opposite the names of the respective Shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't
Brown, G. A	403	100	$ 6 00
" G. A., Trustee	464	5,000	300 00
" " "	465	2,500	150 00
Bogart, O. H., Trustee	414	500	30 00
" " "	428	100	6 00
" " "	430	100	6 00
" " "	431	100	6 00
" " "	432	100	6 00
" " "	433	100	6 00
" " "	435	50	3 00
" " "	436	100	6 00
" " "	447	5,000	300 00
" " "	470	1,000	60 00
" " "	484	200	12 00
" " "	485	200	12 00
Colton, A. O., Trustee	243	100	6 00
" " "	244	100	6 00
Carnes, W. A	252	416	24 96
Chase, Q. A., Trustee	419	3,814	228 84
Durning, T G., Trustee	231	440	26 40
Ettlinger, Isaac	137	600	36 00
Field, W. A	403	100	6 00
Francis, H. L., Trustee	444	1,500	90 00
Gray, H. W., Trustee	416	200	12 00
Horton, Thos. R., Trustee	315	5,000	300 00
Hersey, C. S	95	2 0	12 00
Hall, Wm. E	131	900	54 00
" "	154	1,000	60 00
Hall, Wm. E., Trustee	411	2 0	12 00
" " "	412	200	12 00
Nash, H. W	269	104	6 24
Rosekrans, H M	39	600	36 00
Riordan, Thos D	491	12	72
" Thos. D., Trustee	415	500	30 00
" " "	416	500	30 00
" " "	417	500	30 00
" " "	418	500	30 00
" " "	492	500	30 00
Stout, C. S	486	100	6 00
" " Trustee	422	108	6 36
" " "	476	2,000	120 00
Scarles, W. A., Trustee	429	250	15 00
" " "	322	250	15 00
" " "	429	1,040	62 40
Shankland, Robt	144	600	36 00
" "	173	400	24 00
Taylor, J. N	102	1,000	60 00
" "	330	40	2 40
Waller, L P. F., Trustee	358	100	6 00
" " "	367	3,000	180 00
" " "	458	100	6 00
" " "	459	100	6 00
" " "	460	100	6 00
Winn, A. H., Trustee	466	1,000	60 00
Wetzel, Theo, Trustee	337	40	2 40
" " "	360	1,000	60 00

And in accordance with law, and an order of the Board of Directors, made on the 16th day of October, 1889, so many shares of each parcel of such Stock as may be necessary, will be sold at public Auction, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California, on TUESDAY, THE TENTH (10th) DAY OF DECEMBER, 1889, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

J. M. BUFFINGTON, Secretary.

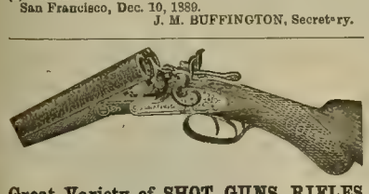
Office, Room 11, No. 303 California St., San Francisco, California.

POSTPONEMENT.

At a meeting of the Board of Directors of the Gray Eagle Mining Company, held this day, the day of sale of the above delinquent stock was postponed until Friday, the Third (3d) Day of January, 1890, at the hour of one (1) o'clock P. M.

San Francisco, Dec. 10, 1889.

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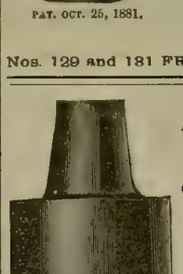
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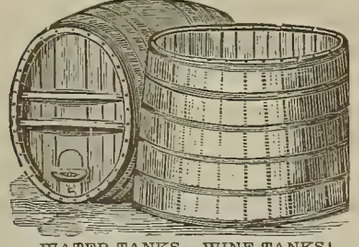
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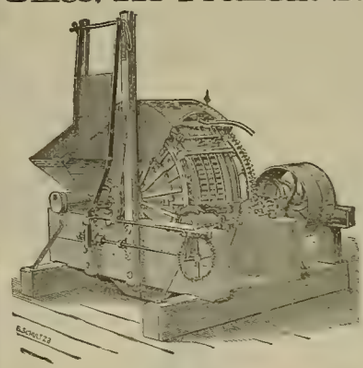
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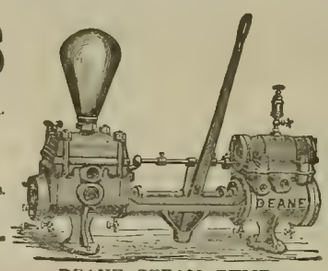
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COAL MINES OF THE WESTERN COAST.

A few copies of this work, the only one ever published treating of Pacific Coast Coal Mining, have been obtained, and are for sale at this office for $2.50 per copy. It was written by W. A. Goodyear, Mining and Civil Engineer, formerly of the California State Geological Survey.

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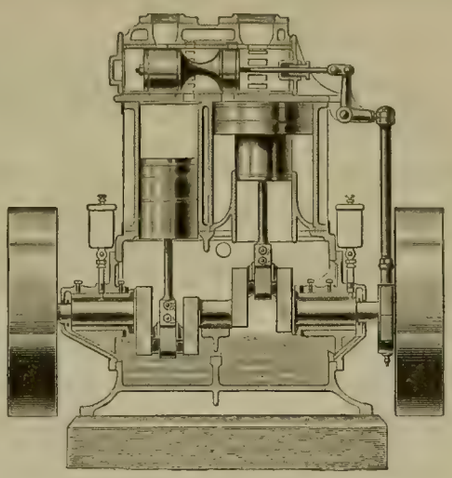
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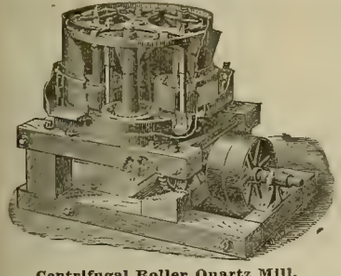
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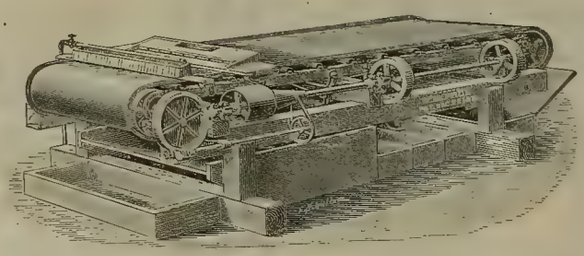
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DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

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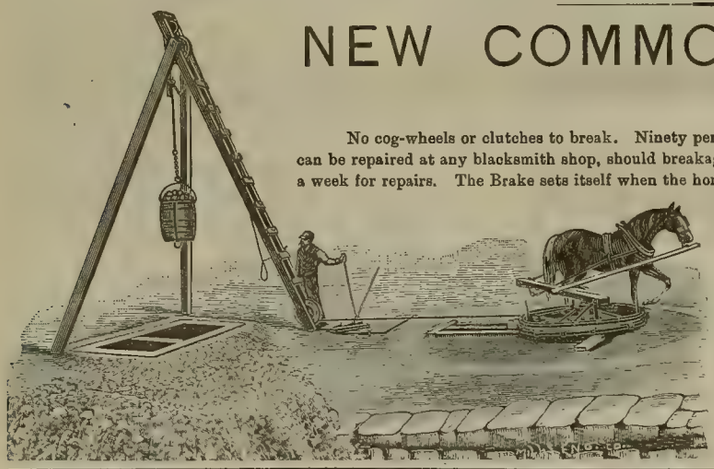
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It can be packed anywhere a jack can go, the heaviest piece weighing but 100 pounds; total weight, 650 pounds. The sweep can be thrown out or in gear at any time, and the bucket hoisted, dumped or lowered while the horse is in motion. It is just as safe and reliable as an engine, and can be handled as readily, and is just the thing to open up a mine and make it pay. Spending thousands of dollars in fine machinery and shaft houses has "busted" many a company. Buy a COMMON SENSE WHIM, and when you have got more ore than our Whim will hoist, then it is time to buy an engine, not before. It will save you thousands of dollars if your mine should not pay. Being all iron except the sweep, it will not rot, warp, twist, or get out of true. Being wrought iron, it will not break in transportation. We also make TWO, FOUR and EIGHT Horse Power Whims, Derrick Whims, and Building Hoists, Ore Buckets, and everything pertaining to Horse Power Hoisting. State for what purpose, and at what place you want to use it.

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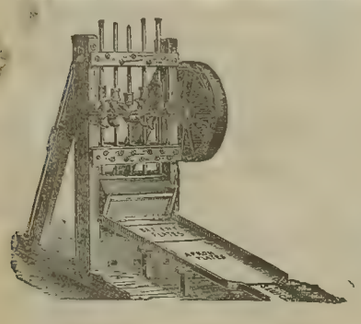
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MINING AND SCIENTIFIC PRESS.

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DEWEY & CO., PUBLISHERS.

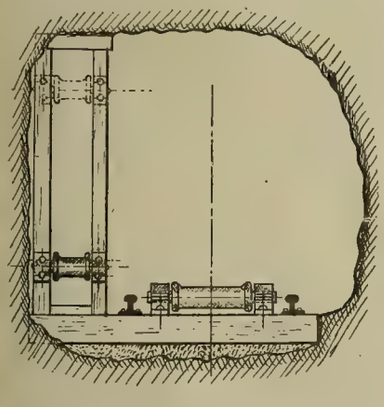
SAN FRANCISCO, SATURDAY, DECEMBER 28, 1889.

Three Dollars per Annum.
Single Copies, 10 Cts.

Rope Haulage in Mines.

In Fig. 1 of the accompanying cuts is shown the arrangement in use in mines where wire rope haulage is adopted. The rope varies somewhat in length on account of changes of temperature and elongation due to working under tension, and this device of a counterweight running over a pulley, and attached to a car carrying the main pulley, permits such variations without detriment to the tractive force or to the rope. A similar device is used on cable railways.

In all applications of wire rope, except vertical hoists, it is necessary to support the rope at frequent intervals by rollers. A cheap and efficient roller (shown in Fig. 2) is constructed of gum wood of as large a diameter as is consistent with the location and from 12 to 24 inches in length. The axles are 1 inch or 1¼ inch round iron, running in simple cast-iron bearings. The much-discussed question of comparative detrimental effect upon wire rope of wooden and iron rollers is doubtless to be answered in favor of the former; but whatever the advantage may be, it is so slight that it is hardly worth consideration, since, in a properly constructed plane, the rope simply rests upon the rollers.



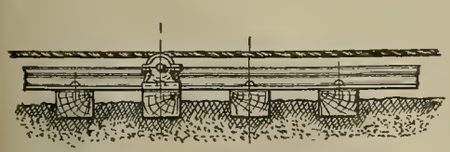


Fig. 2.—ROLLERS FOR MINE ROPES.

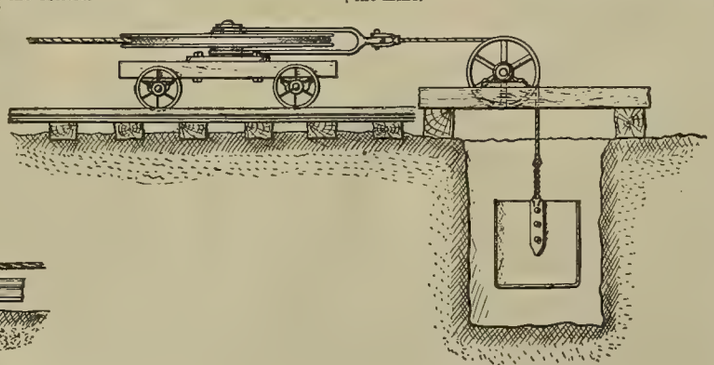


Fig. 1.—DEVICE FOR KEEPING ROPES TAUT IN MINES.

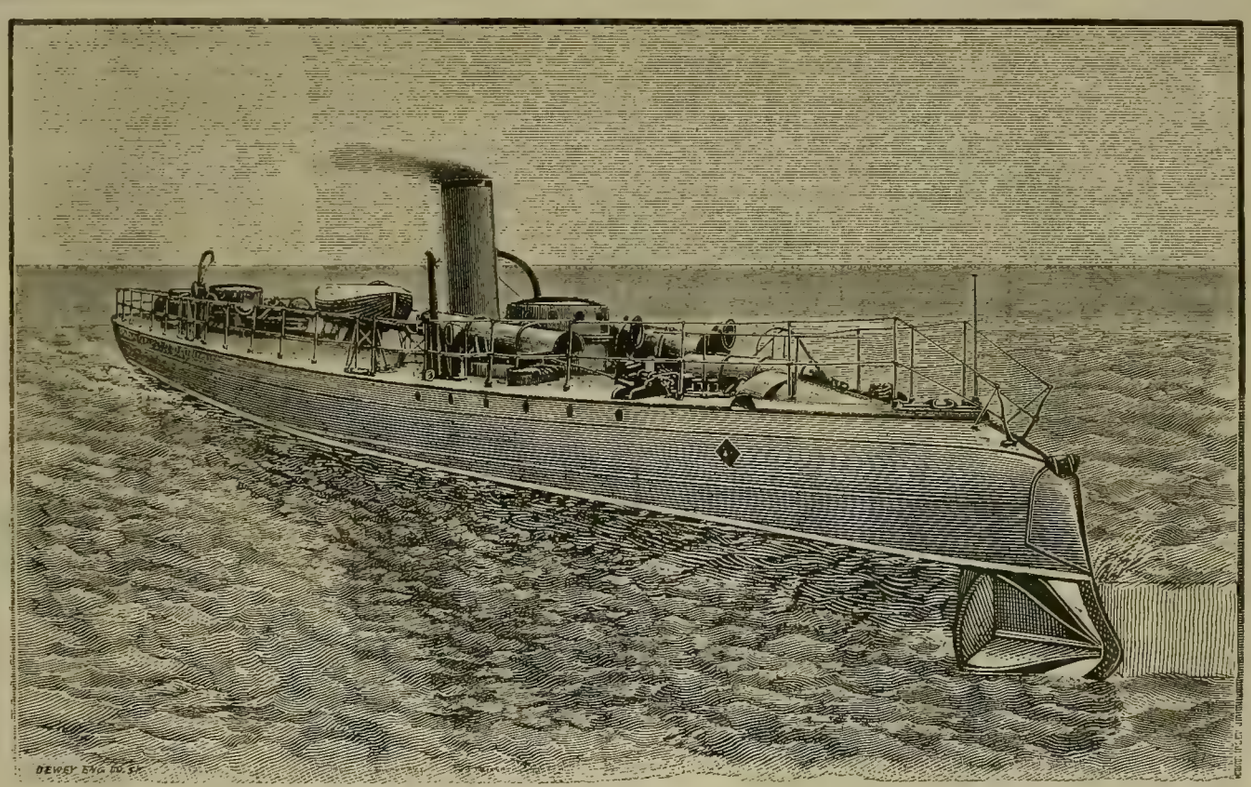
THE surplus in the treasury of Con. Cal. and Virginia Mining Company, after paying the December dividend and the November operating expenses, was given at $78,000. The bullion yield of the current month will probably exceed $280,000, which, added to the surplus, will leave a balance of $30,000 in the treasury, after paying December operating expenses and a January dividend.

AT the carbonate camps of San Pedro, N. M., the Copper Co.'s new 100-ton furnace is completed. The new cable tramway has been tested. It has 10,000 feet of wire rope and carries 100 ore and 20 water-buckets between the mine and smelter.

THE work of erecting another furnace at the Eureka Con. has been begun, and very soon both furnaces will be started up on ore from the mine.

The Centrifugal Auxiliary Propeller.

This patented auxiliary propeller has been invented by an English engineer resident on this coast. Its shape and construction is similar to that of a long-pointed fan, as shown in the engraving, with radial blades tapering to a point in front and increasing in diameter as it approaches the hull of the vessel to which it is attached. The cut shows the application of Stevenson's centrifugal auxiliary propeller to a torpedo boat, from which 50 knots per hour on an even keel is expected.



STEVENSON'S CENTRIFUGAL AUXILIARY PROPELLER APPLIED TO A TORPEDO BOAT.

It can be applied to existing ships by cutting away a portion of the stem of the vessel from the water-line down and backward as far as is necessary, according to the diameter of fan required; but in constructing vessels to use this apparatus, it would not be necessary to construct a fixed stem, as the fan would take the place of the stem as a rotary snow-plow takes the place of the old-fashioned one.

This movable stem or auxiliary propeller is not a screw, but simply a fan to clear away the water and the resistance it causes ahead of the hull of a ship moving at a high speed. It is only on high-speed vessels that it can be used to advantage (where the speed is over 15 knots per hour), such as torpedoes, torpedo boats, yachts and steamboats. In speeds above 18 knots per hour, the inventor is confident that this auxiliary fan will give more efficiency than can be accomplished by increasing the size and horse-power of engines and screw-propellers. Take the case of the steamships City of Paris or Teutonic: Each of those steamships, at a speed of 19 knots per hour, develops 18,000-horse power.

(*Continued on page 495.*)

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Notes of Travel in Nevada.

[From Our Own Correspondent.]

Reno.

As your correspondent visited Reno after an absence from the city of several years, he was surprised at the improved appearance of this important town. It has a clean-cut, thrifty look. The business property along the principal streets is kept in good shape, and does not straggle on from one block to another in rickety, ramshackle structures, but presents a solid, substantial frontage. The effects of a great conflagration some months previous were apparent, but it was astonishing to notice the vigor and enterprise that are being evinced in rebuilding everything in better style than before. The large Depot hotel and several other fine structures were consumed during the last fire. All but the Railroad hotel are rebuilt by this time. Except for a stringency in money matters with the railroad company, their hotel would also have been rebuilt at once. For two long blocks near the railroad track, on the south, there is a compact frontage, every store being occupied and thriving. A cross street, for two blocks south, is similarly lined. Then there are several large stores on the opposite side of the track, and business places to a considerable number are found on two other cross streets. Thus the heart of Reno is getting large, and it throbs with a vigor equaled by few towns or cities in the Sierra Nevada region.

In casting about to ascertain the causes for Reno's growth, and the basis for its future stability, we see, first, that it is in the center of one of the richest agricultural portions of the State. The "Truckee Meadows," which produce the finest alfalfa, and which nourish vast herds of cattle, lie adjacent to the city. This is a great stock and dairy country. Then Reno is something of a railroad center. The Virginia & Truckee railroad has its northern terminus here, running hence to Virginia City, through Carson, the capital of the State. The Nevada & California railroad, a narrow-gauge concern of growing importance, extends from Reno northward and penetrates as far as Lassen county, Cal. The Central Pacific, of course, gives Reno connection with the world to the east and west. Reno is 154 miles from Sacramento and 244 miles from San Francisco. It has two flouring-mills, planing-mills, three nurseries, a soap factory and other industries. It is said that a great woolen-mill, and a sash, door, blind and box factory are about to be established. It has two banks—one with $300,000 capital, the other with $200,000 capital. It has two fine newspapers, both daily.

Reno has a population of town and surroundings of 7000. It has always been an extensive shipping point for goods, machinery, etc., for all parts of Storey, Lyon, Ormsby and Douglas counties, and for Susanville and the Honey Lake valley. It has always been a progressive town. Its residents are active, energetic and prosperous. It has fine water-power, and will undoubtedly become a manufacturing center in the near future. Here is located the Nevada Insane Asylum, the building and grounds of which do credit to the town and State. The State University is also now located at Reno (having been removed from Elko), and is in a more flourishing condition than ever before. This institution has recently been made an Agricultural Experiment Station. Here is located Bishop Whitaker's excellent school for young ladies, and also a similar school, first-class, in charge of the Sisters of Charity. There are, besides, five public schools. The town is well supplied with churches and public buildings of all kinds adequate to present requirements. The city contains many first-class, fire-proof business houses, depots and railroad buildings, many attractive retail stores, excellent and commodious hotels, and handsome and comfortable private residences.

The wheat, potatoes and small fruits raised near Reno are equal to any in the country. The State Fair is always held at Reno, and a fine building for exhibition purposes has been erected. The city is the county seat of Washoe, probably the wealthiest county in the State. One of the local papers says:

"Reno is the City of Homes. There is not a house to rent. New buildings are occupied as fast as erected. Reno has advantages which no other town can equal. The climate is mild and genial in winter, and even and healthful in summer. There are no excessively heated or severely cold terms, and while the days may be warm in summer, the nights are deliciously cool. In winter, sleigh-riding is the exception and not the rule." Facilities for irrigating surpass any in the State, and there is no failure of crops. The Reno Water Co. furnishes ample pure, cold water for all purposes. The Electric Light Co.'s electric-light system, already well established, is being augmented. The Gas Co. supplies gas for all purposes. The streets of Reno are lighted by electricity.

Among the hotels, your correspondent cannot refrain from commending the excellent Riverside House, kept by mine host Chamberlain. A more comfortable hotel in which to sojourn cannot be found in Nevada. The surroundings of the house are pleasant, and the internal arrangements past criticism.

Virginia & Truckee Railroad.

This is one of the most wonderfully constructed roads in the world. It diverges southward from Reno toward Carson and Virginia City to the great Comstock lode, where more gold and silver have been produced than from any other deposits in the world. The road is 52 miles long, and winds among the mountains, so crooked that its curves put together are equivalent to 17 complete circles. The distance from Reno to Virginia City in an air line is only 16 miles, and by the wagon-road over the mountains 21 miles; but, as the difference in elevation is 1645 feet, the railroad is made longer to obtain a "grade." On this road, 11 miles from Reno, are the famous Steamboat Springs, which issue from the hillside at temperatures varying from 60 to 212 degrees, though 4500 feet above the sea. They are so named because they puff their steam in volumes. At Mound House diverges the Carson & Colorado railroad, with a three-feet gauge, which extends to Keeler, 293 miles, in a southerly direction and accommodates the traffic of Bodie with its gold mines; Columbus, with its borax deposits, Cerro Gordo, Owen's lake and vicinity. It is also the nearest station to the outlet of the famous Sutro Tunnel, 19,790 feet long, and built at a cost of $4,500,000. Thus by this line comes and goes the traffic of such thriving places as Carson, Lake Tahoe, Virginia City, Washoe, Steamboat Springs, Bodie and Columbus, as well as scores of smaller towns.

Carson City.

Carson City is the capital of the State of Nevada, the county seat of Ormsby county, and was founded as a town in 1858 by Major Ormsby, a man of sterling worth and energy, who was killed during the early Indian war. Carson City is beautifully laid out on the plains of Eagle valley, immediately east of the high-timbered hills forming the eastern base of the main range of the Sierra Nevada mountains. It has a population of 4000. The people are entertaining, generous and energetic. Carson contains some fine and costly buildings, both public and private. The pride of the city is the State Capitol. The building has a very substantial appearance, being constructed of stone from the quarries at the State Prison, located only a mile and a half from the city. The Capitol occupies the center of a square several acres in extent. The square is inclosed with a handsome iron fence. The grounds are laid out and well kept. They are well swarded and contain a variety of shade and ornamental trees, shrubbery and flowering plants. The U. S. Branch Mint building is a large and imposing structure. It is also of stone from the State Prison quarry. The building was completed in July, 1869. It has done and is still doing a great deal of work. The new postoffice building, located in the heart of the business portion of the town, is another magnificent structure just completed, and is undoubtedly one of the finest edifices in the State. The cost was $300,000. The State Orphans' Home is a large and well-arranged building with a small farm in connection therewith. In this institution a great number of orphan children from all sections of the State are well cared for.

The business part of Carson extends for several blocks along the main street upon which the Capitol fronts. Aside from the buildings above mentioned, the most conspicuous structures are the two hotels—the Ormsby House and the Arlington. Each is a good house. Your correspondent was hospitably entertained by D. Kaiser of the Ormsby, who is as pleasant a landlord as one will find in many a day's travel. The prevailing character of the business structures is that of buildings for use—not ornament. As is known by well-informed readers, the mining interests of the State of Nevada have not advanced to any great extent during late years. This is emphatically a mining State, and in consequence of the stationary condition of its most prominent industry, Carson, as the capital city, if not as the representative city, has failed to show any decided growth or improvement since the days of '75–'76, when the great mining boom pushed everything forward with a rush. Still, there is great solidity to Carson. A somewhat extensive agricultural and grazing country lies contiguous to it, and this, with the still continued work in mines in all directions, gives the business interests of the city a steady support. I presume there are few cities in the State in which the merchants are so uniformly satisfied with their regular trade. The railroad shops of the Virginia & Truckee railroad, which are located here, and which give employment to nearly 100 workmen, are an important business feature. The U. S. Branch Mint also employs a goodly force. One can greatly enjoy a stroll along the resident streets of Carson. There is a quiet, homelike appearance about the residences that is attractive. There is a profusion of shade trees, most of which show age and size, indicating that the first settlers planted as well as builded for the future. The tourist or traveler can pass the time pleasantly and profitably if he visits Carson. It is a city which has seen livelier days, but it is a city of solid foundations, and one which will expand in character and dimensions as the State of Nevada increases the diversity of its industries. This it is continually doing. Mining is yet paramount, but agriculture, grazing and the development of hitherto unknown resources will keep the State abreast of the other less populous States of the Union.

Virginia City

Is the county seat of Storey county, and is located on the eastern side of Mount Davidson at an elevation of 6000 feet above the level of the sea. It is indeed a mountain city, the streets running one above the other. Owing to the steep slope of the mountain, the site of the town was by no means favorable; but, at great cost for grading, many fine, level streets were constructed. The principal streets were then filled in to the depth of a yard with waste quartz and other hard, flinty rock from the mines. This work was so well done that to this day the streets are hard, smooth and dry. In 1875 Virginia City began to take on the appearance of a real "city" not only in the number and substantial character of the buildings and swarms of people it contained, but also in the number of conveniences it afforded, its many societies, churches, schools, theaters, clubs, Orders and organizations, usually considered the necessary adjuncts and requirements of civilized and intelligent communities. There were also several daily and weekly newspapers, telegraph, express and all other similar offices required by business and mining men, and by the people at large. Indeed, in 1875 the area of the city was as great as at present, and much more populous, as at that time it was estimated to contain 20,000 people. Hundreds and thousands of these, however, were mere birds of passage, being neither business men nor owners of property. The men who made millions were those who came after the mines had been pretty well prospected, as Mackay, Fair, Sharon, Jones and others. Out of the first "bonanzas," great fortunes were taken. The bonanza of the Ophir, into which the first discoverers of silver—O'Riley and McLaughlin—accidentally dug, yielded about $20,000,000 before it was exhausted; the Savage, $16,500,000; Hale & Norcross, $11,000,000; Chollar & Potosi, $16,000,000; Gould & Curry, $15,500,000; Yellow Jacket, $16,500,000; Crown Point, $22,000,000; Belcher, $26,000,000; Overman, $3,250,000; Imperial, $2,750,000; with Sierra Nevada, Justice, Kentuck and many other mines running from thousands to millions. In all, the yield of the famous Comstock lode has amounted to over *Four Hundred Millions* up to the present time. The total yield of the great ore deposit known as the Consolidated California & Virginia, from the time of its discovery to the end of December, 1888 (under both incorporations), was $119,977,618.34; and the total amount of dividends to the same date was $76,690,800.

Virginia City has now a population of about 9000—an active, industrious, wide-awake people. The mill and mines support a large body of men, $300,000 being paid out for labor and expense every month. There has been much said during recent years about the collapse of the bonanza mines at Virginia City, and the uninformed might presume that little work was being done in the depths of the great properties which have produced the millions above enumerated. There certainly was a great diminution of work in the deep mines when the conjoined mine-owners decided to cease operations in the lower levels. The oppressive heat, and the work of pumping water up to the level of the Sutro tunnel, made mining in these depths so expensive that the ore had to be phenomenally rich to cover the cost of its extraction. During the past summer and fall (1889), this decrease in the extent of work on the Comstock has been made more noticeable on account of a scarcity of water in the Carson river, along whose banks were located many of the mills which should reduce the ores that are hauled to them from Virginia City. These mills are nearly all run by water-power, and there being no water in the stream, the mills have had to close down. Cessation of that work caused a cessation of the work of extracting ore. Notwithstanding all this, the visitor to Virginia City would be surprised to notice the hundreds of miners who still find employment at mill or shaft. In the evening, the principal business street of the city is made busy and is fairly thronged with these sturdy workmen, who are then "off shift," and during the day they are seen going in all directions with lunch-pail in hand, ready to take their turn in the great work which is constantly going on. Virginia City is still a mining camp with few equals in the country. Probably Butte City and Leadville are the only rivals it has. With the rains of fall and winter, water will again flow in Carson river, and an increased force of men will at once be put to work.

There is a rather metropolitan look to many of the mercantile establishments of Virginia City. Some of the stores carry immense stocks of goods, and the leading lines are tastefully displayed in show-windows. Most of the trading in the city is done upon C street, which extends from one end of the city to the other. In fact, the street is continued a good part of the distance to Gold Hill, or reaches fully a mile in length. Upon the side of Mount Davidson, above and below C street, are the homes of miners and business men. All of the mines are lower down the mountain. It is one of the really picturesque cities in the country, and taken in connection with the vast field for observation in the line of mining by the most approved methods and appliances of the age, it presents attractions to visitors unequaled by any other locality on the Pacific Coast. Your correspondent enjoyed his visit here, and can speak words of hearty praise for the liberal and whole-souled people who reside in this great mining city.

Gold Hill, Silver City, Dayton.

The former of these towns is really a suburb of Virginia City. The confines of each touch upon the "Divide," which separates the two places. Being only 1½ miles apart, from center to center, the workmen at one town may and do reside in the other. The alliance is made closer by a few large mine-owners being interested in properties in both places. The Yellow Jacket and the Overman are the two leading mines in Gold Hill, while the Belcher is not far distant; also the Kentuck.

Gold Hill has the same characteristics as Virginia City, only in smaller degree. The manner in which some of its homes are perched upon the sides of the cañon lead one to think that the eyrie of the eagle has almost a parallel in the abode of man. The stores of the place are all grouped together near the largest mines. There is a splendid school and school building at Gold Hill, but it is hardly necessary to say that the playground of the pupils is neither sufficiently extensive nor level to make an ideal baseball field for the lively youths who congregate at the school. Gold Hill is the nominal home of Senator John P. Jones, and his residence and yard are quite attractive. He has, of course, large mine interests here, and with his family spends a few months in town every year or so.

Silver City lies three miles down the cañon, below Gold Hill. In the Bonanza days there were three or four extensive mills here, which were engaged in crushing rock from the big mines. But all of these mills have been burned down, or the machinery has been removed and the buildings have been demolished. It seems almost sad to notice the decline in activity around Silver City in contrast with the appearance of the place as your correspondent remembers it in 1876. There are a few active mines in the hills back from Silver City, but in the town itself there is little to suggest the lively mining camp of former years. I understand there is considerable mining in a small way all about the town, but there are few ambitious efforts in this line. There is still a very good hotel at Silver City, a general merchandise store, livery stable, church, school, and many very comfortable homes.

Dayton being the county seat of Lyon county, it has held its own as to business importance, notwithstanding the gradual decline of some of the mining interests in the vicinity—especially between this place and Silver City. There are two or three important enterprises at Dayton. Being on the Carson river, it has an extensive quartz-mill, ore for which is brought by the narrow-gauge Carson & Colorado railroad from its connecting point with the V. & T. at the Mound House. Dayton is on the line of the C. & C. railroad.

H. G. P.

A Californian in Italy.

EDITORS PRESS:—In my last letter I described our experiences and observations in the Alps. We left Interlaken at 8.35 A. M. and arrived at Lucerne at 2:30 P. M. We took cars for a few miles, then boat for about ten miles; then cars again up a nice little fertile valley for 8 or 10 miles, when we divided our train into two sections and went up a very steep grade over the divide of high mountains by the cog-wheel system, or rack and pinion.

The center track is raised up about one foot and has rack-teeth, while there is a pinion or cog-wheel on the axle of the engine. The raised track and cog-wheel is so nicely adjusted that the engine gets full benefit of traction without sliding. It was a beautiful sight to look down upon the valley. The center track being raised, it left the cog-wheel free to work where there was no track and no grade. The cogs had to be used to get down the mountain into the valley on the other side.

Lucerne.

Lucerne is a beautiful place, fine lake, high hills, old buildings, old wooden bridges built in 1600 to 1789. A large lion chiseled out of a solid ledge of rock, shady walks, good hotels, and stores full of all kinds of native carving. We made arrangements to go on top of Riggi, a high mountain, where there is a magnificent view of six or seven lakes and the Alps for miles. The ascent is made by railroad. It began to rain before breakfast and looked cloudy and gloomy, and we gave it up and put out for Milan.

The wild mountain scenery through which we passed on this trip seems to me must surpass anything men ever attempted to traverse with rails before. We became entirely bewildered, not knowing which way we were going, seeing tracks passing up and down the mountain, supposing them to be another road, and away down at the bottom was a tunnel under the mountain, which we had just come out of. Here is the great Saint Gothard tunnel, which took 18 minutes to pass and is nine miles long. I saw a map of the road and it looked like throwing down a whip-lash on a table. I will not state how many times it crosses its own track, but will try and get a map of the road, so that I may have the correct account of it. I believe men have to be born for such an enterprise, not educated. It seems as though they delighted to make tunnels through the solid rock, there were so many of them. I believe the road is owned jointly by Switzerland and Italy.

Soon after leaving Lucerne the wooden houses turned into stone. We passed a good many small old villages. In the valley there would be a small village and church; one-half mile up the steep mountain another village and another church. The fir tree would grow wherever it could get a foothold, and would be seen clinging to a rock with just enough earth apparently to cover the roots.

Lake Como.

At Chiasso, on the border, all the baggage had to be taken from the cars into the depot or "station," as they are called here, and be examined. We passed the celebrated Lake Como, but did not have a very good view of it. We passed a good many old forts and ruined castles.

After getting fairly out of the hills, we were in a fine level country, which reminded me of the Sacramento valley, except that it was more thickly populated and there were more trees. Mulberry trees are growing on nearly every acre of land in this valley, where I expected to see the olive and orange, but did not see a solitary tree. A great deal of corn is growing in this valley. The climate is rather warm. August is not the busy season, as tourists come here to spend the winter, the season beginning about the first of September.

Milan.

Milan is a very old city, has the old Italian walls left yet, with its several gates. The Cathedral is a great piece of work, far surpassing anything seen yet, and stands third of its kind in the world. I cannot attempt its description; it would take too much time. The Arcade is another famous modern building in the form of a Greek cross, with glass-covered roof over a hundred feet from the ground. Splendid stores and cafes are underneath. It is put down at 300,000 inhabitants, but the streets do not indicate it. It has a very fine opera-house and other buildings that we have no time to visit.

Venice.

There are but a very few persons who can read and see but who know something about wonderful Venice—a city in the sea, whose vehicles of communication are gondolas, and whose highways are canals of water. It is hard to realize that all the buildings are built in the water and have stairs where persons and freight are landed from the boats the same as from your wagon. Persons who lived in Sacramento during the flood of 1862-3 know something of the situation of Venice. I shall not attempt a description. I will mention some things I see and confirm what others have said.

The railroad has a communication with Venice by a stone and iron bridge two miles long and containing 220 stone piers. We had to take a gondola to get to our hotel. It was a great novelty to us to see as many gondolas around the station for a job as there are hacks around stations and ferries at San Francisco. How can I write or describe anything when there are hundreds of gondolas coming and going, with their queer shapes and way of propelling, and a band of musicians with Chinese lanterns at the stairs of our hotel putting forth their best music for what small change they can collect. The houses or buildings do not look very inviting from the outside. The marble is smoky, or turns black, but they are clean and white inside.

The mazes of little narrow streets are wonderful. They do not deserve the name of street, for plenty of them are not over six or eight feet wide, and the tops of the houses nearly touch, and I cannot see over 50 yards ahead of me. Every little distance there will be an arch or bridge across the canal. These arches are always made high enough in the center to admit a boat going under them.

I do not think the city is in a thrifty condition from all the signs that I can see. Tourists come here for the novelty and romance of the present and former times, the novelty of riding in the gondolas and listening to the romantic charm of the music of the gondolier with his guitar. I cannot see what other attractions this city offers. The stench of some of the streets and stores is unbearable. The ceilings are very low, and most everybody sleeps in the second or third story. At every place where there are a pair of stairs, there will be plenty of boats for service.



FLORIDA'S NEW PALM—Pseudophœnix Sargenti.

Thursday morning we procured a splendid, patient, intelligent young, good-looking guide, who showed us more in one day than we could have found by ourselves in two or three, and then could not have fully understood the sights.

We first went through St. Mark's church, which was a bewildering sight of mosaic work, sculpture, columns, crucifixes, paintings, tall Roman candles, priests and beggars. I have seen several waiting around the confession-box to take their turn to relieve their troubled consciences.

The Doges' palace is a place of great interest, especially to the artist and historian, and unless a person is well versed in the two accomplishments, it will be impossible to fully appreciate the sights at this building. It was one of the ancient Capitols of Venice, and especially when the Doges were the presidents of the Republic. We were shown the room in which the presidents were elected, and stood leaning against the rail on the balcony where it was proclaimed to the people, as they had no newspapers in those days. We saw scores of masterpieces by the old masters, grand beyond conception to the untrained eye, and our guide went into the details with the nicety of a vender. It would seem from what they have left of their former lives, all the ancients did was to build stone walls, sculpture and paint.

We can plainly see that the political matters of Italy for the last few hundred years have been in a very unsettled state. There is a little hole in the wall called the "Lion's Mouth." Formerly it had a lion's head on it, but it has been knocked off. This hole leads into an iron box with two or three keys. Spies were employed to see if any one was talking about the Government. If so, a slip of paper with name was put into the lion's mouth, and found its way into the box. Each of the head authorities had a key to the box, which could not be opened until all were present; then no favoritism could be shown. If significant, the party was arrested and thrust into prison.

The Doges' palace is on one side of a narrow canal and the prison on the other, and connected with a narrow, arched, closed bridge, called the "Bridge of Sighs," which has become so well known by Byron's poem of the same name, which was written in one of these dungeons.

With torch in hand the guide bade us follow him down the cold, granite narrow stairs into a dark dungeon with a low door, where many a poor fellow passed his moments between hope and fear, and where Byron took the odd streak to write the poem. I looked around to see what gave him the inspiration. I could not repeat two lines where the terminal word would harmonize with anything, whether sacred, profane, ancient, modern or original. When the prisoner was tried, he passed up these same narrow, damp stairs over the bridge, to the court-room. There are a few narrow openings in the center of the bridge, and as the condemned was being hurried on by the guard he looked wistfully through these openings and cast a sigh for his fate. We went into another dungeon where men were sent for 20 years, and never saw daylight again. A small hole was cut through the wall to put in food and water, and a little niche was cut on the opposite side to put in a lamp during the daytime. Many of these atrocious things could be related, but is it not better to let some rest with the past?

Water is expensive, and not of the best, as it is brought from the mainland. Women pack water in copper kettles of about two gallons each on hooks at the end of a pole, like a Chinaman. Men pack buckets of water round the street for drinking, with a little wooden stand for glasses and with bottles mixed with decoctions to put in the glass. One favorite ingredient is anise. They claim it neutralizes the effect of the water. They call with loud voice: *aqua, aqua.*

We took steamer and went over to an island that faces out into the Adriatic sea where there is a bathing-place. The water was very shallow and muddy, and the day being hot and feeling unwell, I did not test its buoyant qualities. I have tested the Adriatic water enough to certify that it has very strong saline qualities in it.

The Rialto bridge, the highest and longest in the city, is of arched stone and has 24 stores, 12 each side from center. Wood is sold to the poorer class by tying half-a-dozen pieces like hop-poles with strong grass for a few pennies.

Moonlight Ride in Venice.

It is 10 P. M., and we have just returned from a gondola ride by full moon and Jupiter's full orb glistening at us. This ride has been our dream for years. We started at 8 o'clock in one of the largest gondolas and the same one we had our pictures taken in this morning.

We went on the main canal under the Rialto bridge and down as far as the station and railroad bridge. Men and boys were in and going in swimming everywhere. We could see something sticking out of the water looking like a pumpkin floating. The little fellows seemed to have more pleasure than any of them. There would be a gathering of 15 or 20 mothers and older people at the edge of the water on the steps, while in the water it would look like a school of frogs playing and sporting. We sang and talked and rowed and thought of all kinds of romantic and sentimental things before we could fully realize that we were on the canals of Venice, being propelled by a gondolier in the light of the moon. Some few stores were lit up, but most of them were gloomy. It was a beautiful and bewitching ride, and all were sorry when our time was up. D. FLINT.

Florida's New Palm.

[Written for the PRESS by E. N. REASONER.]

Your engraving shows Florida's newly-discovered palm, *Pseudophœnix Sargenti*, which was discovered in the summer of '86, on Elliott's Key, by Prof. A. H. Curtiss and Prof. C. S. Sargent, and named (as it was sufficiently distinct to constitute both a new species and a new genus) in honor of the latter, by Prof. Wendland of Germany. It is known nowhere else in the world, and in but two small groves on the Keys—containing in all not over two hundred specimens. It is a half-dwarf species, never exceeding 20 feet in hight. The palm is pinnate-leaved, and somewhat resembles some species of *Phœnix*. The leaf-stalks drop off as soon as the leaves die, leaving a free, clean-looking trunk, the upper part marked with alternate rings of green and brown. It is perhaps the rarest palm in cultivation, and destined to be so for years, as the trees rarely perfect seeds.

This palm is eminently suitable for house or outdoor decoration, where the temperature does not range below 45°. It will stand occasionally a low temperature, and not be harmed, where the soil is moderately dry. Young plants transplanted from the natural habitat require careful cultivation for several years, until a perfect crown of leaves is formed. Plants thus treated are the only specimens now available. The seeds are carefully gathered, and in a few seasons there may be young plants suitable for transplanting,

Royal Palm Nurseries, Manatee, Fla.

Mine Drainage.

The Pumping Association at the Comstock.

The original agreement between the Gold Hill and South-end Comstock mining companies for draining the flooded levels of those mines has been signed by all of the companies included in the agreement.

The agreement has been ratified by the companies and signed by the presidents and secretaries of each in the following order: Belcher, Crown Point, Kentuck, Seg. Belcher and Mides Con., Overman, Caledonia, Alpha Con. Mill and Mining Co., Exchequer, Con. Imperial, Confidence, Challenge, Justice and Yellow Jacket.

R. F. Morrow, Hon. W. E. Sharon and S. L. Jones compose the executive board, in whom is vested the authority "to take all steps, ways and means which said board, or a majority thereof, shall deem necessary, convenient or expedient, to free from water the said mines. * *

"That said board, or a majority thereof, may from time to time determine what sum of money will be needed for the purpose of drainage."

Of the sum required, the Crown Point, Belcher and Yellow Jacket agree to pay 17½ per cent each; the Kentuck, 7½ per cent; the Seg. Belcher and Mides Con., Overman, Alpha Con., and Exchequer, 5 per cent each; the Caledonia and Justice, 3 per cent each; the Confidence and Challenge, 4 per cent each; and the Con. Imperial, 6 per cent.

The parties to the agreement shall be known as the Pumping Association, and all contracts made and debts incurred by the Executive Board shall be in that name.

Any of the mining companies, parties to the agreement, desiring to withdraw therefrom, must give six months' written notice, at the expiration of which they will not be bound by any contract made by the Executive Board.

The signing of the above agreement signifies an era of renewed prosperity for the Comstock lode, as the opening of the flooded levels of the above-named mines will necessitate the employment of a large force of miners. It is a well-known fact that large ore resources are located on the 1700 and 1800 levels of the Crown Point and Belcher—where the vein has a breadth of above 200 feet—the extraction of ore from which was suspended on account of the flooding of those mines below the 1500 level. In several of the mines included in the "Pumping Association" there are large areas of unexplored ground, from the 1400 down to the 2500 level, where favorable indications of the presence of ore were passed by in the haste to attain greater depths prior to the abandonment of deep mining.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

AMADOR GOLD MINE, LD.—*Ledger*, Dec. 21: The rains have seriously interfered with the plans of the companys by making the roads impassable for heavy teams, thereby preventing the delivery of the machinery to complete the mill. The Gates crusher is now at Ione, and as the total weight is 26,000 pounds, and the heaviest single piece is estimated to weigh 12,000 pounds, it is likely to remain there for some time. No teamster would care to undertake its delivery while the roads are so bad. The rainy weather has interfered with the outside work, but about 65 men are employed in the development work, principally on the 550 and 650 levels. The west vein is being opened by drifts north and south on the hanging-wall, and by an upraise and winze to connect with crosscuts on the 550 and 650 levels. The vein continues as good as where first struck. In a few days the winze sunk from the 250 level will connect with the north drift from the south shaft at the 550 level, thereby ventilating the lower workings. This winze is sunk on the middle vein, close to where the rich ore was found a year or so ago, on the 250 level. When connection is made the vein will be prospected at the 550 level for the rich ore.

SUTTER CREEK.—The rainfall to Dec. 19th is 25.83 inches, and no sign of abatement. The tunnel at the Lincoln, which is full of water, is to be drained by digging an open cut which will tap the end of the tunnel. Mr. Stewart is satisfied this can be done, and has put a force of men at work on it. It will require a cut 100 yards long. The mill of the Sutter Creek mine, after an idleness of a few weeks, to enable the men to get through some barren ground, is expected to start up Monday, and a long and prosperous run is anticipated. At the North Star, the nature of the ground has changed considerably of late, getting much softer and of a slaty nature.

KENNEDY. — Twenty stamps of the Kennedy mill were started this week. The other 20 stamps will not be started until sinking the shaft is finished, which will take three or four months yet. The ore in the lower level is of fine grade, but the ledge is small—from two to four feet wide.

Calaveras.

A RICH STRIKE.—*Mountain Echo*, Dec. 19: H. S. Messer & Son of Altaville made a rich strike the other day in the old Davis mine near Bald Hill. We were shown some of the specimens taken out of the mine that are immensely rich, being about one-third gold. They have taken out several hundred dollars during the past few days, and have frequently got as high as $50 to the pan. The Davis mine is famous for pockets.

THE Gold Cliff mine and mill are kept in operation day and night. A cleanup was made recently, and we understand that the yield was entirely satisfactory.

El Dorado.

QUARTZ.—Placerville *Observer*, Dec. 19: Dr. W. W. Stone has made a quartz discovery on his lead near Steele's ranch that promises to be of importance. The ledge so far as developed is two feet wide and prospects for high-grade ore. The Dr. is prospecting to ascertain the length of the ore chute, which he thinks is 500 feet. Mining news is very encouraging in the vicinity of Greenwood. Reports are coming in every day of mines being opened, and large forces being put on those that are now running.

KELSEY.—Georgetown *Gazette*, Dec. 18: Owing to the recent heavy rain, work had to be suspended on the Big Sandy mine, but will be resumed with full force as soon as the weather permits. This mine, under the management of Beatty & Norton of Toledo, O., has proved itself to be an excellent investment to the owners, besides being a great benefit to this neighborhood, in the way of giving steady employment to many. Nat Dryden was the lucky finder of a $60 nugget a few days ago. It was a fine specimen of quartz gold, and was found on the Old Judge, a well-defined quartz ledge, owned by J. C. Murphy. H. D. Tefft is reported to have struck a $20-to-the-pan diggings on his seam claim, where recently he found a pocket of several hundred.

SEAM DIGGINGS.—Placerville *Observer*, Dec. 21: H. D. Tefft is reported to have struck a twenty-dollar-to-the-pan diggings on his seam claim, near Kelsey, where recently he found a pocket of several hundred.

PACIFIC.—Prof. Thos. Price is with us again looking after Pacific mine affairs, and report has it that a force of men will soon again be put to work.

Inyo.

NEW PROSPECTS.—*Independent*, Dec. 20: Several good prospects of recent discovery are reported from Big Pine. Well up in the Sierras ledges have been opened and the ore yields $70 to $80 per ton in gold. Over in Deep Spring district some good ledges are also opened. Recently George Turney took out enough ore in three weeks to leave him a profit of $700. Such is the report given by a citizen of Big Pine.

DARWIN.—Mr. C. Anthony started up the mill at Darwin on the 18th of November. Recently a few days' loss of time was caused by rains that prevented fuel from being hauled. That difficulty was overcome and the mill started up again. The run is now nearly completed.

AT CERRO GORDO Mr. Farrington is timbering the Union shaft. A drift is also being run from the old Omega tunnel to connect with the old Union workings. Till both of these jobs are completed it is not likely that much actual mining will be done.

Plumas.

INDIAN VALLEY MINE.—Cor. Plumas *National*, Dec. 21: This valuable mine is now under the management of its owner, S. R. Prentiss, with John Taylor as foreman. Mr. Prentiss has been under a heavy expense this summer getting ready to crush, and is now running in full blast with 26 men employed. The Union tunnel is now in 3400 feet and is still driving ahead. Good rock is being taken out of the main shaft in the 300-foot level and the shaft is to be sunk 100 feet deeper. The mining men are rejoicing over the prospects of a good water season the coming summer, and without a doubt this will be the liveliest section of Plumas county. There are many valuable mines around here which only need energy and push to accomplish large results, and with the outlook now we expect to soon see a boom in this section.

Nevada.

FINE ORE IN THE OMAHA.—Grass Valley *Union*, Dec. 21: The Omaha mine is coming to the front as a valuable property owing to the recent developments on the ninth and tenth levels, where fine bodies of ore have been uncovered, which have the appearance of being very extensive, as the lode has been making constant improvement of late. The managers do not say how good the ore is and are disposed to be conservative as to statements, but at the same time say the appearance of the mine is much better now than at any previous time in its history.

Trinity.

EAST FORK.—Cor. Trinity *Journal*, Dec. 21: We differ from the placer miners in one respect—we don't need more water than enough to give us water-power for our mills, and the past month we have had more than enough. The Enterprise has had to shorten their working force on account of superabundance of water; there was too much of it in the mine. The Enterprise mill is running on good rock, and soon there will be a good cleanup from that reliable old mine. The company has two good ledges—the Enterprise and the Lone Jack—and they deserve the success they have met with for the pluck they showed in taking hold of and developing the property. They have one of the best pieces of property in the northern part of the State. The mill on the Yellowstone mine has been completed and probably will be running by the time this letter reaches you. The company undoubtedly has a good mine and will send out considerable bullion this winter. There was some trouble a few weeks ago with the hands, but everything is running smoothly now. Mr. Paxton, the efficient manager, is one of the best quartz miners in the State. This mine is bound to make a good showing, and I think W. T. Coleman will be sorry that he parted with it. The North Star mill is nearing completion and will make, when finished, the fifth mill on East Fork. The company has a large ledge of low-grade ore, and are now running a tunnel to tap it at considerable depth. When the vein is cut they will have enough quartz in sight to last them a long time. When the stamps begin to drop on their ore, a good paying property will be developed, and much will be added to the permanency of the camp. They have a splendid showing for a valuable mine. It is a great pity that the Golden Chest mine is tied up in litigation, as it is one of the best showings in camp for a fine paying investment. The ledge stands straight up and the rock speaks for itself. It has not been managed to the best advantage in the past, but whenever it is worked on a business basis, it will prove a dividend-yielding property. Frank Peterson has shut down his mill for awhile, but will probably start it as soon as the necessary development work has been done. There are a number of other good mines in camp, some of which are being worked by arastras that would pay handsomely if they could be worked with the necessary capital. The prospects of the camp for the winter are most flattering, and before spring I expect to see East Fork sending forth a stream of bullion for the benefit of the camp and the county, too.

Tuolumne.

A SPECIMEN.—Stockton *Independent*, Dec. 20: W. E. Garrett of Ripon, who owns a nice pocket mine on Bald Mountain, one mile north of Sonora, which in the last 10 or 12 years has yielded half a million of dollars, yesterday deposited in the San Joaquin Valley Bank the most valuable gold specimen ever shown in this city. The chunk is about the size of a man's hand, and is worth for the gold in it about $800, but as a specimen it has far greater value. It is composed of rough-shaped gold clinging to crystallized quartz and is beautiful in shape and color. The mine was first opened in 1857 and in early days was known as the Turner mine. In late years it has been leased on shares, Mr. Garrett making large sums out of it without cost to himself.

CLOSED DOWN.—*Union-Democrat*, Dec. 21: The Golden Gate mine closed Saturday evening last, and all hands laid off. The ore of this mine assays high, and it is evidently a good property. The frequent ceasing of operations on the mine of late are wholly attributed to the bad working of the machinery.

NEVADA.

Washoe District.

SIERRA NEVADA.—Virginia *Chronicle*, Dec. 21: On the 520 level at a point in the south drift from the east drift, 275 feet from the main east drift, an east drift is advanced 256 feet, the face continuing in porphyry and showing streaks of quartz.

UNION CON.—On the 1465 level, in the north lateral drift 100 feet south of the north line of the mine, west crosscut No. 4 is advanced 22 feet and is in hard porphyry.

MEXICAN.—On the 1465 level from the north drift from west crosscut No. 1, 50 feet in from the lateral drift face, west crosscut No. 2 is advanced 29 feet.

OPHIR.—On the 1300 level from the end of the east crosscut from the shaft station a south drift is advanced 152 feet from the end of the east crosscut, 316 feet from the shaft station, continuing in porphyry and quartz.

HENDRICKS.—Repairs to the shaft timbering still in progress.

SAVAGE.—Shipped 466 tons of ore, battery sample assays showing an average value of $20.90 per ton. Have bullion on hand valued at $15,586.

CON. CALIFORNIA & VIRGINIA.—From the stopes on the 1300, 1435, 1500, 1600 and 1650 levels continue to extract ore sufficient to supply the Morgan and Eureka mills. On the 1650 level, from points heretofore designated, continue to extract ore. The north drift from the winze bottom, 60 feet below this level, is extended 451 feet, continuing in low-grade quartz. From upraise No. 7 above the west drift from the C. & C. shaft, about the center of the California ground, a north drift is advanced 55 feet in ore and porphyry. During the week 1113 tons 1540 pounds of ore were shipped to the Morgan mill, 1827 tons and 710 pounds to the Eureka mill. The average assay value of all the ore worked at these mills during the week, according to battery samples, was $26.73. Bullion valued at about $28,000 now on hand in the assay office. Shipped to the Carson mint during the week bullion valued at $52,524.16 by assay.

BEST & BELCHER.—On the 625 level from the top of the upraise east crosscut No. 1 is advanced 40 feet. Formation, soft porphyry with streaks of quartz. On the 1000 level east crosscut No. 1 is extended 55 feet. Formation hard porphyry.

GOULD & CURRY. — On the 200 level the southwest drift is extended 230 feet. Formation soft porphyry with streaks of quartz showing some value. On the 400 level west crosscut No. 2 is extended 97 feet. Formation quartz showing some value.

HALE & NORCROSS. — Shipped to the Nevada mill during the week 1102 tons of ore showing an average value of $22 per ton, by pulp assays. Bullion on hand valued at $36,638.30.

CHOLLAR. — Crushed 340 tons of ore during the week showing a pulp assay value of $21 per ton. The usual progress is made in 930, 850 and 750 level explorations with no important change in formation.

POTOSI.—The 800 and 750 level drifts are in vein matter.

NORTH GOULD & CURRY AND EAST BEST & BELCHER.—The west drift from the northwest drift is out 200 feet and has entered quartz.

IMPERIAL.—West crosscut No. 1 from the 500 level joint Confidence-Challenge drift is in low-grade quartz. The joint east crosscut continues in quartz and porphyry. West crosscut No. 2 on the 300 level is in quartz and porphyry. The north raise is in low-grade quartz.

YELLOW JACKET. — Daily ore shipments average 76 tons, battery samples showing an average assay value of $20.50 per ton.

CONFIDENCE & CHALLENGE.—The joint 300 level east crosscut is in quartz and porphyry.

ALPHA.—The west drift from the 600 level station is in porphyry. The north drift is in low-grade quartz.

EXCHEQUER. — The 382 level east crosscut is in clay and porphyry and the 500 level north line west crosscut is in porphyry.

WARD COMBINATION SHAFT. — The 1800 level west drift is advanced 100 feet.

OVERMAN.—Shipped 205 tons of ore to the Vivian mill during the week.

NEW YORK CON.—The 700 level drifts from the top of the raise above the 1300 level are still showing quartz.

EAST SIERRA NEVADA.—The 520 level south drift is out 580 feet.

CALEDONIA.—Have begun crosscutting from the southeast drift.

CROWN POINT.—Shipped to the Mexican mill 847 tons of ore showing a value of $17 67 per ton by pulp assays. Shipped to the Carson mint December 19th bullion valued at $8482.82.

BELCHER.—No. 2 east crosscut on the 1200 level has reached the hanging-wall. An east crosscut from the end of the south drift has entered quartz assaying from $6 to $15 per ton.

SEG. BELCHER.—The winze sunk below the 1200 level east crosscut has connected with the top of the raise above the 1300 level.

NORTHWESTERN CON.—Sinking the shaft to the 100 level.

SILVER HILL.—Usual progress made in 160 and 260 level explorations without change in formation.

ALTA.—Crushed 340 tons of ore showing an average pulp assay value of $25 per ton.

JUSTICE.—Crushed 314 tons of ore showing a value of $22 62 per ton by battery sample assays.

UTAH.—On the 600 level the southeast drift is advanced 546 feet from the shaft station. Formation porphyry.

OCCIDENTAL CON. — Repairs to track and ore chutes in progress. Shipped concentrates valued at $6434.

NORTH OCCIDENTAL.—During the week run out to the Occidental Con. mill 320 tons of ore.

WEST CHOLLAR. — Drifting west to cut the vein at a depth of 200 feet.

WEST COMSTOCK.—Advancing lower tunnel to connect with winze sunk below the floor of the upper tunnel.

Columbus District.

THE MT DIABLO.—Walker Lake *Bulletin*, Dec. 19: Following is Supt. Shockley's weekly report: The south crosscut from the east drift on the 6th level is in 17 feet. The east drift between the 5th and 6th levels is in 15 feet and shows a little low-grade ore in the face. The raise from the east drift in this intermediate is up 22 feet and shows some ore of fair grade in the top. We are starting an upraise from the east drift on the 5th level on some low-grade ore. In the intermediate between the 4th and 5th levels we have a raise that is up 23 feet and shows some $40 ore in the top. The stope near No. 1 winze between the 3d and 4th levels is giving a small amount of low-grade ore. The east intermediate drift between the 2d and 3d levels shows 8 inches of $150 ore in the face. There is no special change to report from any of the stopes. The mill has been running steadily during the week and doing good work.

New Pass District.

TO SELL.—*Silver State*, Dec. 19: A year or so ago, through the efforts of Captain C. B. Dahlgren, operations were resumed in the New Pass mines, which are located just south of this county near the Lander and Churchill line. The Steritt Brothers acquired an interest in the mines, which had been lying idle for many years, and now they have opportunity to sell their interest for $20.000, which will pay them handsomely for their year's work.

Reveille District.

ANOTHER STRIKE.—Eureka *Sentinel*, Dec. 21: Mr. Clark has made another rich strike in Reveille district, Nye county. The new find is supposed to be a continuation of the old Gila ledge which proved so rich in early days. There were at least three good fortunes made out of the Gila. Mr. Clark, Harry Barnes and John B. Magee realized each about $250,000 from the working of the high-grade ores. Ex-Governor Adams is now the owner of the Gila mine and mill. We are glad to hear that Mr. Clark has again struck it rich. He deserves it. He has stuck to the old camp for many weary years. There is any amount of good mineral territory south of Eureka, which the new railroad will render accessible.

Robinson District.

A FINE SHOWING.—White Pine *News*, Dec. 21: The Joanna bonanza continues to loom up bigger and richer with every day's work that is done upon it. The bad weather of the past two weeks made it necessary to have the small working force transferred from the surface to underground, where the work being done is daily exposing higher grade ore without limit as to extent. The roads too have been bad and the hauling of ore to the mill has been impeded. We wish to call the attention of capitalists and mining men to the many other promising mining claims in this district, some of which are adjacent to and look far more promising than did the Joanna six months ago. The owners of many of these claims are poor men who are hampered in developing their claims for the want of means, but who would gladly give men of money an interest in their mines for a working capital, or sell out to them at a reasonable price. There are a dozen or more claim-owners in Robinson district who can offer like inducements to capitalists, but they must abide their time. The time will come, and the properties that capitalists could now invest in for a few thousand dollars will go up into the hundreds of thousands.

PROBABLY A SALE.—Eureka *Sentinel*, Dec. 21: There is a well-authenticated rumor in mining circles to the effect that the Watson gold mine at Robinson has been sold to an English Co. Capt. Plummer of Montana is said to have negotiated the purchase. The figure we hear most frequently mentioned is $250,000. As the story runs, Mr. Watson refused to bond the property, but gave Captain Plummer the refusal of it, provided he came with so much money in a certain number of days. It is believed the Captain will "get there" on time. The claim set up by Mrs. Walcott of San Francisco to a half interest in the property may exert a discouraging influence and defeat the sale.

Pioche District.

BLACK LEDGE WINZE.—*Record*, Dec. 14: The greater the depth attained the more difficult becomes the work of pumping out the Black Ledge winze at the Raymond shaft. Last Sunday the men in the winze attempted to renew some of the packing about the pumps, and not being thoroughly prepared, a mishap occurred which made the work of repairs so difficult as to occupy several hours, during which time the water raised 27 feet in the winze. On Tuesday another accident occurred and a further rise of 15 feet in the water resulted. Before these accidents, water was out for 167 feet and it will take some time to recover the ground thus lost.

Tuscarora District.

ELKO CON.—*Times-Review*, Dec. 20: The drift at the foot of the incline has been extended six feet; rock very hard.

DIANA.—South drift from the crosscut from North Belle Isle 300-foot level, has been extended 10 feet. Face shows bunches of ore.

NEVADA QUEEN —South drift from Commonwealth has been advanced 15 feet, and is developing well. Face is all in ore, two feet of which assays $210 per ton.

NAVAJO.—The stopes above the 150-foot level are without material change and are producing some very good ore. Both boilers are now in good repair.

BELLE ISLE.—West crosscut, 350-foot level, extended nine feet, total 35 feet. South drift from west crosscut, 250-foot level, extended four feet, and the crosscut therefrom extended 13 feet.

NORTH BELLE ISLE.—North gangway, 600-foot level, extended 21 feet. Rock hard but breaks well. The crosscut from the 300 station extended 25 feet; total 244. The stopes near the Queen line are looking very well.

GRAND PRIZE.—400-foot level: Winze from south drift extended downward 21 feet. West drift from north crosscut extended 14 feet, and face of north crosscut on the 500-foot level advanced 12 feet.

NORTH COMMONWEALTH.—Second level: Will finish cutting out station in about three days, and start drift from same. Joint crosscut east has been extended 9 feet, exposing high-grade ore. The flow of water has increased, but does not interfere with the work. East crosscut from south drift extended 12 feet in low-grade ore.

DEL MONTE.—1st level: No. 2 east crosscut from south drift has reached the wall, and have started to crosscut west from same point. 2d level: Good progress is being made in cutting out for station, and will start drift in about three days. 3d level: Joint crosscut has been extended 9 feet, still showing high-grade ore. Quite a flow of water is coming in through the face.

COMMONWEALTH.—100-foot level: No. 1 east crosscut extended 15 feet, all in vein formation. North drift from No. 3 chute advanced 10 feet, opening up good ore. South drift from No. 4 chute extended 10 feet. North drift from the same chute advanced 10 feet; total length of drift, 35 feet; fine ore entire distance. Car samples assay $275 per ton. No. 5 chute has been extended up 12 feet; is getting into same ore as that of No. 4 chute. No. 6 upraise extended upward 15 feet in the vein, giving low assays. South drift started from No. 1 east crosscut is in 6 feet; face all in first-class ore. 150-foot level: No. 11 upraise is up 20 feet, following good ore. North drift from north intermediate extended 12 feet—about 4 feet more to go to connect with No. 1 east crosscut. East upraise is up 22 feet, in vein showing some low-grade ore. The stopes where any work has been done look first-rate. Ore crushed at concentrator, 420 tons; average battery, $16 per ton; 132,000 pounds concentrates average assay $305.11 per ton.

ARIZONA.

THE RED ROCK.—Florence *Enterprise*, Dec. 21: The Red Rock M. Co. is progressing most favorably. The well which is being sunk by John Gardiner is being put down rapidly. It is the intention to sink it to a depth of 450 or 500 feet; this well is located about one-fourth of a mile from Friday's well. It is the intention to sink the Atlas well 200 feet deeper. It is now 500 feet deep and nearly filled with water, but a larger flow is desired. The Atlas smelter is being put in repair. A new jacket is now in transit. It will be put in place and the smelter running by the middle of January. It will have a capacity of 40 to 50 tons per day. The ore will be taken from the Red Rock mines. The Atlas ore will at present be used to furnish flux. There are 32 men now employed by the company. This force, however, will be necessarily increased soon. Mr. H. K. Cole is general manager, and Dr. Alex. Trippel is consulting engineer and will give part of his time to the company; he will superintend the erection of the

smelter. E. L. White is the superintendent. The prospect of the future for the company is good. The Red Rock Co. have started out with a temperance camp and they say it works well.

BULLION.—Prescott *Courier*, Dec. 16: Ten bars of gold bullion, worth about $18,000, were brought to the store of Bashford & Burmister, recently, from the Crowned King mill, Bradshaw district. This amount was taken out of Crowned King ore in 20 days, by the company's 10-stamp mill. J. D. Helm, superintendent of the Oro Bella mill and mine, arrived here recently. From him we learn that the Oro Bella, Crowned King, Ryland and Del Pasco mills were running when he left. Mr. Helm has about 20 men employed at mine and mill.

ORO BONITO.—Prescott *Journal-Miner*, Dec. 18. Messrs. Dougherty & Cooper sent out several men, with supplies, to the Oro Bonito mining district this morning. They go to do required assessment work on several locations owned by these gentlemen.

COPPER BASIN.—G. K. W. McNary was in town yesterday with samples of ore from his new discovery near Copper basin. Samples of the ore sent to the State mineralogist of California elicited a very flattering acknowledgment from that official, with a request for additional samples and full particulars as to the location of the claim. He says the specimens sent contain cinnabar in iron ore. The samples brought in yesterday showed richer than anything heretofore obtained. The claims are owned by G. W. K. McNary and his son, R. C. McNary, who say the ore can be traced for a width of 400 feet on the surface by one mile and a half in length. J. C. Hartin left this morning with a camping outfit, and an assistant, for Bell's canyon, to do assessment work on a mining claim there. He expects to be absent until Jan. 2d. The new steam hoist for the Black Horse mine has been placed in position, and was started up this afternoon. This is a mine recently sold by D. Boaz to Kansas City parties. The Dosoris people have five tons of ore ready for shipment. The water has all been taken out of the shaft of the Black Horse mine, and work will be resumed again on the property. Samples of black sulphurets taken from the bottom of the shaft assay as high as $300 per ton. Miners from the southern part of this county, who thought they could do better by shipping their ore direct to smelters via Phœnix, have found their mistake, and are again selling the product of their mines to the samp'ing works.

FROM OTHER COUNTIES.—The Arizona Copper Co. is averaging eight tons of copper bullion per day. It is estimated that for 1889 the output will amount to over 250,000,000 pounds. The Arizona Co. has now expended over $5,000,000 on its mines, railroads and improvements. It has 36 miles of 36-inch track, connecting Clifton with Lordsburg, and 14 miles up the canyon. The Copper King Co. has at last got to work after eight years of litigation. They have put up a furnace and have over 20 men employed. They have working capital of $50,000. It has been a good mine from the first.

COLORADO.

THE LAST DOLLAR.—Aspen *Times*, Dec. 18: The Last Dollar mine in Tourtelotte park is now regarded as one of the most valuable properties in this district. There has recently been developed in the mine a second ore chute that is fully as large and as rich as that which first gave the property its reputation. This second chute lies north of the first body of ore that was struck, and is being worked at a point about northeast from the old workings. The ore in the Dollar is of a very superior character. It runs from 14 to 30 per cent lead, and from 80 to 100 ounces silver per ton. Manager Frank Everett has just made a contract with the Driver Public Sampling Works for the output of the property for six months, at very favorable figures. During December, he expects to accumulate sufficient surplus to enable him to sink the shaft some 200 feet deeper, in order to work the mine more directly and economically.

MINING NOTES.—The water in the Bushwhacker is making some trouble. The sump has had to be bailed out twice in the past ten days. Solid formation has been reached in the big Smuggler mountain tunnel. The air drills will be in operation next week. A small shipment was made yesterday from the second level of the Little Annie mine. It is rumored that a strike has been made in the Deane group on Porphyry mountain. Dr. Paul, who has just returned from Denver, states that he feels confident that he will be able to start up the Aspen mine again with full force by the 1st of January. He has not yet closed his ore contracts, but it is possible they will be arranged in time to start before the first of the year. Judge Herrick is following a small streak of very good ore in the Oakley No. 2, with a splendid prospect of opening a bonanza. He ships from 6 to 15 tons per month that runs from 120 to 175 ounces per ton in silver and about 10 per cent lead.

DAKOTA.

IRON HILL.—Deadwood *Pioneer*, Dec. 15: The Iron Hill smeltery closes down to-day after an eight days' run on pyritic smelting. Seth Bullock, president of the company, whose confidence in the process has been manifested from the first, stated to a *Pioneer* reporter last night that he is perfectly satisfied with results. The run proves that Bald mountain refractory ores can be treated here at a low cost as in Omaha—$10 per ton. This, too, with the present exorbitant price of fuel. There is no further necessity to ship ores; railroad companies in the future will be kept busy bringing in coke and taking out matte instead. During the run to be completed this morning, two carloads of matte have been turned out, a quantity greater than ever before produced in the United States. The plant will be given a thorough overhauling and be blown in again in about two weeks. In reply to the question how long will be the next run, Mr. Bullock stated: "There is no reason why we shouldn't run a year." In the Iron Hill mine itself a large amount of ore is in sight. Most of it, however, is of low grade, about $15 per ton. The mine is at present being worked on the 160, 200 and 300 levels.

GENERAL MERRITT.—Deadwood *Pioneer*, Dec. 21: Jiggers to concentrate ore from the General Merritt mine are now being placed in the Richmond mill, Galena. It is thought that all will be in readiness for ore concentrating to begin by January 1st. The method, though new in the hills, was employed successfully in Nevada and Idaho for several years by Mr. Havens.

TOURMALINE.—H. B. Young has on exhibition in his office a specimen of rock carrying black tourmaline crystals. It was presented by William Wilson, who obtained it from a location he is now developing in the southern hills.

RUBY.—Considerable activity is going on in the above camp. The North Star is working a force of ten men under Steve Mahoney. The Emmett is working two men. The Comstock and Belfast are about to continue sinking their shaft and the Thanksgiving group are about to commence operations. Prospectors are abundant in the district, opening up their properties.

LOWER CALIFORNIA.

A GOOD SHOWING.—Alamo *Nugget*, Dec. 10: Ever since this district was discovered last spring general statements have been made favorable to the mines, and it must be gratifying to the friends of the camp that their favorable opinions can now be substantiated with facts and gold bricks. They often maintained their opinions in the face of slanderous and prejudiced reports concerning this district. To show what we have here, let us take for example the following figures, copied from the official report of Mr. Sutherland, superintendent of the mines belonging to the International Company, kindly furnished us by Mr. Crenshaw. The quartzmill is a 20-ton Huntington mill, which crushed an average of 16 tons per day, and the following figures cover a period of 44 days—the whole run up to November 30:

Name.	Tons ore.	Per ton.	Amount.
Princesa	120	$36	$4320
Telemaco	29.5	26	767.0
Ulises	163.50	31 56	5334.51
Cocinero	74 25	28.05	2082.72
San David	21	26	546
Grandissima	13.75	26	357
Totals	693.5		$20,314.73

This is only a starter, but it is a good showing. None of the mines are deeper than 100 feet and only two have reached that depth. There are other mines here undoubtedly as rich as those above mentioned, but concerning which it is not yet possible to give figures.

EL PASO.—Major Zimpleman states that the new hoisting and pumping machinery for the El Paso Company was expected in Ensenada by Monday's steamer and will be brought here and placed in position within two weeks. Sinking on all their mines will then be pushed forward vigorously. Mr. Dobler, formerly of the Oro Grande mine at Daggett, will arrive about the 20th from San Francisco to operate the mill, which will start up about Christmas with 600 tons of ore ahead.

MONTANA.

WORK GOING ON.—*Inter-Mountain*, Dec. 17: A small new hoist has been completed on the old Bell mine, now one of the properties of the Chambers syndicate. The engine is fed with steam from the boilers of the High ore. Considerable ore is being taken out from the old workings on the 300 and 400 foot levels. The old dumps of the Mountain View, that have been formerly let to leasers, will be worked entirely by the company on the completion of the contemplated mammoth smelter and concentrator at Great Falls. Johnny Rowe is working one of the dumps of the Stevens and Geo. Waters the other. Mr. Waters made a shipment of ore yesterday. The manipulators of steam at the West Colusa are three in number, Bonnie Orcutt, Geo. Waters and William Deal. Those directing the work under ground are Thomas Gilbert and Thomas S. Quinn. At the East Colusa, the engineers are P. Kelly, John Martin and Pete Peters; the shift bosses are Thos. Williams and Thos. Treloar. A trip to the Anaconda mine yesterday afternoon resulted in the finding of nothing of any particular interest to chronicle unless it be the presence of four able-bodied miners protecting the property from the intrusion of outsiders. On being asked when it was thought the company would be able to open the shafts they stated that it was impossible to tell. The main shaft is heavily bulkheaded at the 40-foot landing and steam is being injected into the burning mine by six of the large boilers at the works. At the St. Lawrence where the bulkhead is put in at the collar of the shaft the dirt is so warm that it is almost impossible for one to stand on it for any great length of time. The company is using three of the boilers also at these works injecting steam into the St. Lawrence. The smell of gases is still prevalent throughout the atmosphere, still indicating the presence of fire.

UPPER BASIN MINES.—Montana *Mining Review*, Dec. 20: The mines of the Upper Basin District are going to make a record for themselves, and that right away. Genuine active operations commenced in this particular locality about a year ago, since which time work has rapidly progressed on not only nearly every known mine in the upper basin district, but the contagion has spread to all the other districts within easy striking distance. On the Kleinschmidt property, adjoining the Riall mines, work has been actively prosecuted for the past six months, and regular shipments of ore of good grade are now being made with the probability of these shipments being kept up all winter. Probably no other mine of the district gives better promise of future greatness than the Little Alma, on Shoofly mountain, and upon which property there is just now displayed greater activity in the way of development than upon any other mine in the district. The mine is being worked under bond to Cleveland, Ohio, and St. Paul parties, by a force of 12 or 14 men, who are engaged in driving a tunnel to cut the vein at a depth of 80 or 90 feet below the upper workings on the property. Work is progressing rapidly upon the Crescent, upon a spur of the northeastern slope of Bald Mountain. So far as developed this mine shows immense bodies of good concentrating ore, and the recent developments made within the past five weeks have demonstrated the fact that shipping ore of an excellent quality can be obtained with depth. There are many other valuable and prominent mines of this particular locality deserving of special mention, chief among which may be mentioned the Josephine, Dunleith and its several extensions, the Barbara and other mines and prospects in its vicinity, Morning Star, Robert Burns, Montana, Little Charlotte and many others. On the Copper Belle, located between the junction of Eureka creek with the Basin, and the Morning Star mine, owned by Winter Brothers and others, work is also being actively prosecuted and a hoist will be shipped in and put up at once.

GRANITE MOUNTAIN.—Phillipsburg *Mail*, Dec. 19: The output for the week ending Dec. 19th was 54 bars of bullion, containing 76,988 ounces fine silver and 176.2 ounces fine gold.

THE ELIZABETH.—The sinking of the Elizabeth (West Granite) shaft progresses at the rate of 12 feet per week. It will take nearly a year to sink the 500 feet.

THE MONTANA.—In the Red Lion district sinking on the Montana proceeds through a rich vein of gold quartz, all of which is retained for shipment. Whiting & Co. are confident of its richness, and propose to establish a mill on the property some time next year.

THE BELL FLOWER.—Operations have been temporarily suspended at the Bell Flower mine, near Black Pine, on account of the water that has been coming in so freely of late. They could not dispose of it with the facilities at hand and the company will be obliged to purchase a pump before the work can proceed.

NEW MEXICO.

DEVELOPMENT WORK.—Silver City *Enterprise*, Dec. 20: A carload of zinc ore was shipped by M. W. Neff to La Salle, Illinois, on Monday. Should this shipment prove successful, Mr. Neff will soon be shipping several cars per day. The Pacific Company, it is learned, has started up with a light force, and the Deep Down has made slight additions to its working force. A new strike has been made at Carlisle, about a half-mile nearer Carlisle than the Bailey strike, by Chas. Vernon and Wm. Thomas. It is reported to be of even more importance than the Bailey strike. Some Eastern parties are now investigating the alum deposits near the Gila hot spring, with a view of purchasing. John Knight, one of the pioneers of Georgetown, who owns a number of claims of merit in the camp, has about completed the organization of a company with sufficient capital to open up the mines in good shape. The mines of the Mimbres Company join this property, and good pay ore has been taken out by the company up to the line of the Knight property. The Confidence group of mines on Silver creek is now the cynosure to which the eyes of the mining world are now being directed. The attention of Mr. Leavig, a prominent mining operator of Denver, Colorado, was directed to this property early in the summer, and after careful and repeated examinations, negotiations, having in view the purchase of the property, were instituted and were virtually consummated last Tuesday. The Confidence and the Blackbird, measuring 2500 feet in length, show an unbroken line of croppings the entire distance, and at no point along the strike of the lode is the pay or milling rock less than five feet in width and frequently measures 16 feet in width. The developments consist of tunnels, shafts and open cuts. The workings have yielded from about 800 to 1000 tons of ore, worth, as it is mined, $50 per ton, and in this connection it will be understood that the ore is not assorted and is absolutely free from any waste material whatever. The Bluebird, belonging to the group, is noted for producing rich ores, having a milling value of $120 per ton. The ores carry sulphides of silver and copper glance and free gold. Thirty-five hundred tons are on the dump ready for treatment.

SMELTING PLANT.—Silver City *Enterprise*, Dec. 21: The probabilities are that a smelting plant, which will treat custom ores, will soon be erected in this city, drawing its principal support from the concentrates of the Pinos Altos mines. A desirable quality of iron exists here in inexhaustible quantities, while the mountains are full of lime. The only class of metal which it would be necessary to import would be lead, and even this may be produced in abundance in a short time from the west side of Pinos Altos. A smelting plant, under the proposed management, would certainly be a success here, and would open up a market for the dry ores at the very door of the mines. There is no question as to the amount of ore and concentrates which can be produced by the mines of Pinos Altos, and the expense of shipping in coal would be much lighter than the cost of transporting the concentrates to smelters in other sections. If the plant is erected, mining in general in this section will receive an impetus which can be considered little less than a "boom."

THE CHARM.—Kingston *Shaft*, Dec. 21: Last Tuesday the body of galena in the east shaft suddenly turned into pyrites of copper and silver glance. An average assay of a 34-inch streak gave a return of over 600 ounces silver. This is the most important discovery made this year on the North Percha.

HILLSBOROUGH MINES.—The Empire mine, owned by Messrs. Dickinson & Co., has a tunnel run in on the vein something over 100 feet. Mr. Dickinson has over 20 tons of fine ore on the dump, that he is satisfied will run over $100 per ton in gold. He has recently struck some splendid looking ore in the face of the tunnel that is rich in silver. The Golden Era is bonded. There are tons of fine looking ore on the dump, of the same general character as the other ores of the district. The Rachael mine, owned by Martin & Co., situated north of the Mamie Richmond, is an excellent prospect.

THE GYPSY.—This great property still increases its production and value by development, and it now has in sight one of the largest bodies of ore ever seen in this section.

THE U. S.—The main tunnel will cut the old workings and drain them of the water which has kept the mine from being worked for the past year; although the drifts were in pay ore that averaged 230 ounces per ton by the carload.

OREGON.

THE NEW MILL AT WORK.—Baker City *Democrat*, Dec. 19: At Cracker Creek, on the 11th the first run of ore from the Eureka & Excelsior mines passed through the rock-breaker and began its journey down through the long line of dryers, roasters, stamps, pans, and settlers, on to the retort, where it is hoped the residue may be what every one confidently expects it will be, and what will prove on its first run of this newly completed mill, that which will demonstrate that the Eureka & Excelsior Con. G. M. Co. are the possessors of a veritable bonanza, not equaled by anything on the Pacific Coast. Those who have not visited the works, little conceive the vastness of this plant or of its importance to this district. From the boiler floor to the upper floor the elevation is 105 feet, and over 2,000,000 cubic feet are contained within its walls. Numerous other buildings outside the main structure complete the plant. The machinery is all of the very latest design and best make, and under the steady stroke of a 150-horse power Corliss engine moves without a tremor or strain. A ditch conveying water from up the canyon will relieve this engine and furnish power during the water season, being conveyed from the ditch to the mill through pipes and with a fall of 625 feet, and working on Pelton water wheels will furnish sufficient power for both mill and air compressor. This feature of the plant is an important one, and for six months in the year will save the company the entire cost of steam. The mine is developed to the extent of over 200,000 tons of uniform and high-grade ore in sight, and prospect work still going on, with ore in the face of either drift. The mine is connected with the mill by means of a tramway over which the ore is carried direct from the mine to the mill in cars and dumped over grizzlies into the ore-room, where it is shoveled into a Blake rock-breaker of 125 tons capacity. From here it drops into a rotary dryer where all the moisture is driven out and then falls from there into self-feeders to the battery below of 20 stamps of 950 pounds each. Here it is pulverized, and passing a 45-mesh screen is conveyed automatically to an elevator and raised 62 feet in blankets arranged on an endless chain to a White & Howell roaster. The pulp now partly freed is dumped into a bin, where salt is introduced, the roasting completed and chloridizing begun. We next find the pulp on the cooling floor below where chloridizing is completed, and it is now ready for the pans and is conveyed down chutes to cars and taken to the pans on that level ready for charging. The pans are eight in number, capable of treating two tons each, every four hours. The machinery is in charge of Mr. E. F. Farnham, late of the Drumlummon, Montana. Mr. K. M. Reeves is his assistant. The mines will still be in charge of Robt. Cunning, as foreman, and with the new Burleigh drills in operation such progress will be made in one week as has heretofore occupied months of the most patient and persistent toil.

ITS VALUE ESTABLISHED.—*East Oregonian*, Dec. 14: The stockholders of the Buffalo M. Co., who have been at work for two years past developing its property in the Granite creek country, are beginning to receive returns on their investment. Some months since they began running a tunnel 500 feet in length, and recently came across a vein of ore rich in ruby silver. To test its value they shipped a carload to a sampling company in Denver, and to-day they are in receipt of $1081.49 clear of all expenses. This makes the property worth a very large amount of money.

UTAH.

PROSPEROUS EUREKA.—Salt Lake *Advertiser*, Dec. 20: Among the growing mining camps of Utah is the prosperous and picturesque little city on the west side of Utah lake among the hills of the Oquirrh range of mountains. Since the completion of the railroad to Eureka, this rich and famous camp is being more widely known than heretofore. Eureka is talking of incorporating as a city of the third class, and not long ago raised quite a sum of money by subscription for the purpose of building a public schoolhouse. While the railroad may possibly hurt the business of teaming, all the ore being formerly hauled to Ironton for transportation, yet the increased travel and business will more than equal the loss so incurred. Reports from Eureka state that new prospects and developments are constantly being made, and the outlook for the future is bright indeed.

PROVO'S NEW STRIKE.—While an *Advertiser* representative was at Provo this week he had the pleasure of examining some specimens of gold ore taken from the newly discovered mine a mile and a half from Provo, by F. W. C. Hathenbuck. The new find promises to be exceedingly valuable, and Mr. Hathenbuck and the people of Provo are rejoiced over the discovery. Samples of the ore near the surface assay over $3 to the ton, and it is easily mined. The mine is also increased in value as it contains fine strata of roofing slate and building stone.

PARK NOTES.—*Record*, Dec. 21: A few days ago the south drift on the 1300-foot level of the Ontario mine, in No. 2 shaft, crosscut the vein at a distance of some 200 feet from the shaft. The distance between the walls proper is about 50 feet, but of course it is not all ore between the walls. However, the ore vein is very wide and is of high grade. In fact, the vein on this level shows up better than it did on the 9th, 10th or 12th levels. It is being demonstrated that as deep as the Ontario workings go the ore body maintains its magnitude and rich character.

THE NEVADA-NORTHLAND.—The leasers of the Nevada-Northland situated up Woodside gulch have struck it rich. After sinking their shaft to a depth of 300 feet they drifted on the vein and have driven it about 60 feet, and it is still being run ahead. The early part of the week the pay streak widened from a small seam to about 18 inches, and since then it has continued to widen until it is now over two feet. The ore is rich, assaying from 30 to 180 odd ounces silver and from 30 to 76 per cent lead to the ton. A 50-ton lot of the ore is being made up for shipment, and the leasers believe it will easily net them $100 a ton.

THE CREOLE NO. 2.—The leasers of the Creole No. 2 have a carload of ore sampled and ready to be shipped to the smelters. The ore will probably yield $50 a ton.

CAMP CROSSCUTS.—Owing to the heavy snow storm ore shipments were very light this week. The Union concentrator has been closed for the winter. The trial lot of Anchor second-class ore yielded satisfactory results. The Apex is reported as having got into a body of ore, larger and richer than any strike it has yet made.

ORE AND BULLION SHIPMENTS.—The Ontario bullion shipment for the week was 32 bars, containing 16 909.26 fine ounces silver. During the week the Mackintosh sampler received and forwarded 112,760 pounds of Mayflower No. 7 leasers' ore; 55,550 of Alliance; 29,170 of Woodside; 19,280 of Daly, and 17,250 of Creole No. 2 leasers' ore; total, 234,010 pounds.

MECHANICAL PROGRESS.

Converting Crude Metal into Steel.

The Latest Improvements in the Art.

The invention of converters has greatly increased the safety and safe rapidity of railway travel. Through the cheapness of this process, the wrought-iron rail has been entirely superseded by the stronger and more perfect steel rail. This process was introduced by Bessemer in 1856. It consists in burning out the carbon, silicon, sulphur and other ingredients contained in crude iron, by means of the intense heat and violent stirring derived from a blast of hot air blown with a great pressure through the incandescent mass of iron; this has been melted in a cupola and run into the converter, converting it into a homogeneous malleable metal. When the proper state is reached, which moment is ascertained by spectroscopic observation of the flame, the converter is supplied with melted iron, called spiegeleisen, which contains a certain uniform portion of manganese; it causes the steel to be less brittle and promotes sound casting. The melted mass is poured into large ingots. The operation of blowing the converter produces a most brilliant pyrotechnic display. It can be seen at the works of forty different establishments throughout the United States. After this process is gone through, there is still left phosphorus, which decreases ductility and promotes brittleness. In this country we have comparatively little phosphoric iron; but in England immense quantities of Cornwall ore were rendered valueless by the fact of their containing this substance, which rendered them unfit for conversion. Two young Americans, Thomas and Gilchrist, came to the rescue with their invention of a basic lining to the converter, which, with the addition of a certain percentage of lime, causes the phosphorus to leave the metal and unite with the slag.

Different ways of applying the blast to the converter have been the subject of other inventions. In the Roberts process the body of metal in the converter is acted upon by a blast which divides it into small portions and imparts a gyratory motion to the mass, which brings every portion in succession in position to be acted upon by it.

But there are certain variable conditions which render the result variable unless provision is made to counteract them. The carbon and silicon, as they are burned out, do not use up all the oxygen of the blast, which has then a greater tendency to unite with the iron. This can be partially avoided by reducing the blast as the fluidity of the metal increases, and the quantity of carbon and silicon decreases. But this is not a perfect remedy.

The Latest Improvement,

For which two patents were granted Sept. 24, 1889, is due to the ingenious mind of John W. Bookwalter of Springfield, Ohio (one of the largest manufacturers of steam engines in the world). Mr. Bookwalter's improvement is designed to regulate the quantity of oxygen to suit these varying conditions, and thus avoid the production of oxide of iron, the latter being, of all the impurities generated in the process of conversion, the most injurious to the quality of the metal. To this end two blasts are introduced; one blows directly into the metal and the other blast passes through a charcoal fire in the furnace and this burns out the oxygen. This blast enters through the hollow trunnion.

These blasts may be alternated and regulated so that the volume of the blast may be maintained or the oxidizing agent reduced as the process proceeds. The action of the deoxygenized blast, after the converting blast is cut off, violently agitates the separated portions of the metal and washes out the impurities, while maintaining a gyratory motion which brings every portion of it under its influence.

IRON AND STEEL IN BUILDING.—Iron is rapidly increasing in its use for houses. You can buy a complete iron house at the manufacturer's in England and have it set up anywhere in pieces. A large number of iron villas have been sent from England to the Riviera and put up there on plats of land purchased or leased, with the provision that when the lease expires the house can be taken away. A very favorable account is also given in the French papers of the new system of building houses of steel plates, introduced some time ago by M. Danley, manager of the Societe de Chateneau, who has satisfactorily ascertained that corrugated sheets, of no more than a millimeter in thickness, are sufficiently strong for building houses several stories high, and the material used allows of quite a variety of architectural ornamentation. The plates thus employed are of the finest quality, and as they are galvanized after they have been cut to the sizes and shapes required, no portion is left exposed to the atmosphere. It is asserted that houses constructed in this manner are very sanitary, and heating arrangements can readily be carried out.

DRILLING CAST IRON.—Mr. L. B. Breckenridge, the instructor in mechanical engineering in the Lehigh University, has lately been making some experiments for the determination of the pressure exerted in drilling cast iron. He made a cylinder in which was a plunger having an area of ten square inches. Three small grooves were turned in the plunger near its lower end, so as to prevent any leakage of the oil with which the cylinder was partly filled. Two holes were drilled in the cylinder near the bottom, and a steam gauge and an indicator were attached. The indicator cord was attached to the hub on the shaft of the quick-return motion lever in order to obtain diagrams of considerable length. When the piece to be drilled was resting on the plunger, a diagram could be taken which would show the pressure exerted in forcing the drill through the work. With ¼-inch twist drills the greatest downward pressure was 400 pounds; with ½-inch, 900 pounds; with ¾-inch, 1100 pounds; with 1-inch, 1450 pounds; and with 1¼-inch, 1800 pounds.

EXPERIMENTS IN MAKING RUSTLESS IRON ARE COMPLETELY SUCCESSFUL.—The rustless process, which has been until lately an experiment, has now demonstrated that great economy can be used, not only in ice-pipes, but in every article where iron is used. In the past year over 2,000,000 kettles have been subjected to this process in Pittsburg. The method is very peculiar. After the article is made, it is put into a furnace about 3½ feet high, 15 feet long and 8 feet broad. The furnace is made in an oval shape, air tight. After the iron has been in the furnace for two hours, and it has attained almost a white heat, the air that comes through the regenerators and air-valves is shut securely off, and the furnace is made air-tight. After the air has been shut off, the superheater, which is located in the combustion-chamber at the rear of the furnace, and at right angles from the air-valves, is opened and the furnace is filled with steam and kept in this condition for eight hours. At short intervals a small valve is opened, so as to allow an exodus of steam in the furnace, allowing fresh steam to be put into the furnace. When the articles have been ten hours in the furnace, there has been accomplished the formation of magnetic oxide upon the iron surface. They are then put into an acid-well, which is the last treatment.

CAST IRON BRICKS.—Hollow, cast-iron bricks, if we may so term them, says the *Engineering and Building Record*, form the subject of a recent German patent granted to August Bockel of Erfurt. As the name implies, they are made of regular brick form and size, the walls being 0.12 inches thick. No mortar or other binding material is to enter in their use, the fastening being effected as follows: The upper and lower sides of the bricks are provided with grooves and projecting ribs which fit into one another. There are, further, two large circular openings in the upper side of each brick, arranged to receive properly formed projections on the lower side of the brick above. One of these projections is hook-shaped so as to give a more secure hold. A fluid is applied to the surfaces of the bricks with a brush, to make the joints air and water tight. The non-conducting air-spaces in the bricks, and the ease with which they may be put together and taken apart without injuring them, are cited as special advantages. The question of cost is not considered.

ZERCON—WHAT IS IT?—Zercon is a metal not found pure. In fact, no use for the pure metal has ever been found; therefore it has not been reduced. An oxide of this metal, called zerconia, is the most infusible of all the known oxides. The oxide is reduced to a fine powder. A common cotton wick is thoroughly filled with the powdered oxide, then the cotton is burned out. The wick is all consumed excepting a thin, delicate, snow-white column of the zerconia, which is left exactly the shape of the wick. As the burning gas impinges upon this column of oxide, the latter becomes heated white hot, and glows with a soft incandescence, second only to the electric light. A mechanic may not know the name of this burner from the above description, but it is named the Welsbach, and by that name will be readily recognized.—*Northwestern Mechanic.*

BAD POLICY—GOVERNMENT ORDERING MACHINERY FROM ENGLAND.—It is a matter of no little surprise to learn that the United States navy-yard, at Washington, has ordered from Messrs. Greenwood & Battey, in England, a band-sawing machine for cold metal, to cost $16,000, on what grounds, says *Industries*, we do not know, because there are a dozen firms in this country that can construct such a machine quite as well as it can be done in England. A metal-cutting saw is a simple apparatus; moreover, some of the machines in use in England are from American designs. Some we have seen there for heavy work were faulty in some of their details, the feed, for example, and supporting the back of the saws with rollers. We think our tool-makers should see that the duty is paid on the machine when it is imported.

SHARPENING KNIVES.—A dealer in cutlery expresses the opinion that not one man in 50 knows how to sharpen a pocket-knife. "A razor," he says, "must be laid flat on the hone, being hollow ground, and requiring a fine edge. But a pocket-knife requires a stiff edge, and the moment you lay it flat on a stone, so as to touch the polished side, you ruin the edge. The blade must be held at an angle of 20 or 25°, and have an edge similar to a chisel. This is technically called the 'camel,' and is marked on all new knives by a fine white line which does not remove or touch the polished surface. Knives improperly whetted are often condemned as too hard or too soft without reason."

SCIENTIFIC PROGRESS.

Saccharin—The Concentration of Sweets.

It is perhaps not generally known that the sweet substance, known as saccharin, is really an American discovery. According to the *Scientific American*, it was discovered accidentally in the Johns Hopkins University at Baltimore, by Professor Ira Remsen, who was making some investigations into the nature of some of the higher derivatives of carbon compounds. The professor was assisted at the time by one of his students, Dr. C. Fahlberg. The compound upon which Fahlberg happened then to be engaged was found by chance to be intensely sweet, and was subsequently named saccharin. It was shown to be from 280 to 300 times as sweet as cane sugar, and was deemed especially valuable in medicine. Sufferers with *diabetes mellitus*, by using very much diluted solutions of the chemical in their food, could once more enjoy the "sweets of life." It came highly recommended by doctors, because it was known to pass in quantitative amounts through the human body without any apparent effect on its various processes.

Dr. Fahlberg shortly thereafter went to Germany and undertook the manufacture of this substance on a commercial scale, and gave it its name, saccharin. At once it found quite extensive use as a medicinal preparation, as an adulterant, a substitute for sugar, both in Europe and in this country. The impure product for sale in the markets sells at about $15 per pound.

Prof. Remsen, who still continues work in the same series, states in a recent article in the *American Chemical Journal* that the commercial form of saccharine is more than one-half impure, and estimates its sweetness as but 125 times that of sugar. It dissolves readily in boiling water, and has several interesting derivatives with sweetening power.

One of these has been found to be intensely sweet in the front part of the tongue, neutral in the middle, and exceedingly bitter in the posterior portion near the soft palate. The investigation with this compound is the best single proof that there exist in the tongue two sets of specific nerve fibers, corresponding to these two kinds of sensation.

Its Deleterious Effects.

But this has been more than compensated by the train of evil that everywhere follows in its path. Authorities differ somewhat on this, but the weight of evidence lies both in the number and the reputation of those who condemn its use. Pflugge has shown that it prevents the action of the ptyalin ferment of the saliva, whose function is to change the undialyzable starch into soluble grape sugar; that it disturbs the gastric digestion, so that egg albumen is dissolved in its presence only after four days; that it has a deleterious influence on the pancreatic and intestinal digestion. He concludes that the substance is not a fit substitute for sugar, and must be especially injurious to diabetic patients, in whom so much depends on a good and healthy digestion.

Other opinions differ slightly from this, but a variety of charges are made against it, for interference in varying degrees, with the many kinds of fermentation and the putrefactive processes that constantly go on in the human system, most of which are connected with digestion and all of which are beneficial. Brewers have found a use for saccharin, not as a sweetener, but more as a preventive of diastatic fermentation, the like of which is performed in certain parts of the digestive tract in man. These are, therefore, likely to be hindered by the adulterant in this favorite beverage.

Its use has been made the subject of legislative action in Belgium, Spain and France. The Belgian Academy proclaims that it is not a food stuff, as it does not represent the nutritious value of sugar, since it seems to pass unchanged through the body; that its application as a sweetener in food preparations and drinks appears to be followed by injury to the health; and that manufacturers are therefore warned that they must give ample notice to the consumer of its presence in articles of food. In Madrid it is called an adulterant; foods containing it are forbidden to be sold under penalty, while the article itself is heavily taxed. The French Government, some time ago, put saccharin under a temporary ban as a substance possibly injurious to the health. Now it has definitely pronounced against it as a drug, food product and adulterant, and has put an almost prohibitory tariff on its importation.

Little has as yet been heard from this saccharin in public here in America, save as a chemical curiosity. But there seems to be a disposition among chemists to believe that it is extensively used. Our medical experts in the various laboratories of cities and States where adulterated articles and harmful drugs are sought out and the criminal processes of indictment begun, should direct their attention to this, which is undoubtedly a deleterious substance. The good of the country, says the journal from which we quote, should also be consulted by the specialists in the Chemical Division of the United States Agricultural Department at Washington. Let them ascertain if the charges against saccharin be true, and, if so, let them advise that measures be taken to prevent its coming into more general use than has hitherto fortunately been the case. And if these charges should be proved, Congress should, like the authorities in France, put such a high tax on it as will prevent its importation. Dr. Fahlberg has a patent on the method of making his product in this country, and thus we shall be spared the danger altogether.

It is stated by another journal that its presence is beginning to be felt by the beet-sugar factories in Germany, where already so much saccharin has been made as to render 5000 tons of beet-sugar superfluous. It is principally employed there in the preparation of fruits and the production of sweet *liqueurs*. It is not a food stuff; indeed, it has been condemned by eminent medical authorities as directly prejudicial to health. The sugar manufacturers are of the opinion that saccharin should only be sold by chemists. France, Italy and Portugal are already contemplating imposing a tax upon it.

A Remarkable Comet.

Prof. E. E. Barnard of the Lick Observatory, under date of Dec. 7th, furnishes the *Chronicle* of this city with some very interesting facts, noted by Prof. Chandler of Cambridge, in regard to what is now generally known as the "Brooks Comet," facts which Prof. Barnard terms an "extremely important theoretical discovery in cometary astronomy."

Prof. Chandler, upon investigating some peculiarities in the orbit of the comet which was rediscovered last July by Mr. Brooks, and which is still under observation, found that it had made a remarkably close approach to the planet Jupiter in 1886, and that its path had then been entirely changed, the comet being thrown into its present small ellipse, with a period of seven years.

Stimulated by this to find out what the path of the comet was previous to 1886, he was led to the discovery that it was identical with the famous Lexell's "lost comet" of 1770. The comet of 1770 was found by Lexell to be revolving in an orbit whose perihelion was near Venus and the aphelion near Jupiter, with a periodic time of five and a half years. The shortness of this period was singular, as the comet had never been seen previous to 1770, though in that year it was visible to the naked eye.

A further investigation, however, showed Lexell that in 1767 the comet had made a singularly close approach to Jupiter, at which time the great attraction of that planet caused a complete change in the comet's orbit, it being thrown into the small ellipse of 1770. Previous to this approach to Jupiter, in 1767, the comet was moving in a very large orbit, with the perihelion near Jupiter and its aphelion beyond the orbit of Saturn. In this orbit the comet was always too distant to be seen from the earth.

In 1779 the comet again passed still closer to Jupiter, and the attraction of the planet, outweighing that of the sun by over 200 times, kept the comet under its influence for a number of months and again completely transformed the orbit, the perihelion once more becoming so great that the comet could not be seen from the earth.

At its appearance in 1770 this comet approached within less than 1,500,000 miles of the earth, a remarkably close approach—so much so, indeed, that La Place calculated that if the comet's mass had been equal to that of the earth it would have seriously affected the motion of the earth, and would have lengthened our year by about three hours. As no sensible disturbance was experienced, La Place concluded that the mass of the comet must have been less than 1-3000 part of the mass of the earth. It was doubtless vastly smaller than that.

A Companion Comet.

The comet at its present return has attracted a widespread interest through the discovery at the Lick Observatory of the small companion comets that attend it in its motion through space. Mr. Chandler suggests that these may owe their existence to the encounter with Jupiter in 1886, the unequal strain from the opposing attractions of the planet and its satellite system having probably caused a disruption of the cometary matter sufficient to produce the companions.

Carrying the investigation back to 1886, Mr. Chandler found that the comet remained under the influence of the planet for more than eight months, and that previous to then it was revolving about the sun in 27 years' time in an orbit whose perihelion lay near Jupiter. He also deduced the path that the comet moved in about the planet at the appulse, and found it to be a hyperbola with an eccentricity very slightly greater than unity, so that "the comet narrowly escaped being drawn into a closed orbit as a satellite of Jupiter." The nearest approach to the planet in this path was on May 20, 1886, the distance being about 900,000 miles.

At present we cannot tell what have been the changes and vicissitudes of this comet since 1770, through the disturbing actions of Jupiter. It is now, however, free from the influence of that planet until 1921, when it will again suffer great perturbation that may once more whisk it out of sight for 100 years or more. It will in the meantime return under favorable circumstances of observation in 1896, 1903, 1910 and 1917.

It is hardly possible, says Prof. Barnard, to estimate the importance of the discovery of Mr. Chandler, as it presents to us one of the greatest physical and mathematical problems that astronomers have had to deal with.

GOOD HEALTH.

The Russian Influenza.

The epidemic influenza, which first made its appearance in Russia, has already swept over Europe, raged with much virulence in London, Paris and Berlin, and has now made its appearance in New York. At the last accounts it was estimated that 28,000 people were suffering from it in St. Petersburg alone.

The first case which occurred in New York made its appearance on December 11th. It occurred in a Russian family. No cause for the attack was apparent; none of the family have recently arrived from Europe or had associated or been thrown in contact with recent arrivals, or any one suffering from the disease. A couple of them, however, recently received letters from Russia. The ages of those attacked ranged from 50 to 4 years.

On the 17th of December 12 cases were reported in Boston, and there is good reason to believe that it will soon spread throughout this continent. Such is the opinion of Dr. Edson, Health Officer of New York. The attacks are not confined to rich or poor, high or low. The family of the Czar has been attacked, and Von Moltke has been one of the sufferers in Berlin. The fast through trains will soon bring the bacilli which produce it to San Francisco.

Its Characteristics.

A cotemporary says: Influenza is a fancy name which was given long ago to a form of catarrh of the respiratory passage and alimentary canal, when it assumed the proportions of an epidemic. The symptoms are just like those of a cold in the head. The patient suffers from wheezing, sneezing, watering from the eyes and nose, and these are usually accompanied by slight headache, increased temperature and accelerated pulse. It is said that the term of the disease is three days, after which convalescence sets in and is generally quite slow. Deaths from influenza are rare. Occasionally an infant or an old person whose vital power has been exhausted succumbs to the malady, but, as a rule, it is annoying rather than dangerous.

It is easily distinguished from incipient diphtheria by its being unaccompanied by high fever.

The medical books make mention of a number of epidemics of influenza which attracted attention rather by the number of persons who were attacked than by the severity of the disease. When it once gets domiciled in a city, hardly any one escapes.

Like other epidemics, influenza is said to be caused by a bacillus in the air which is inhaled. Thus no permanent relief can be expected from the old treatment, which used to consist of sudorifics, the inhalation of the vapor of ammonia or turpentine, confinement in a warm room, etc. Still, these remedies are harmless, and they may divert the patient's mind from the condition of his mucous membrane. In point of fact, in the present state of medical science, there is no known remedy for the ravages of a microbe which is invisible and which permeates the air in such numbers that its annihilation is impossible.

The First Symptoms of the Disease

In New York were sudden faintness, a chill and marked prostration; then succeeded headache and a general feeling of malaria, followed by acute coryza, pharyngitis and slight laryngitis, winding up with bronchitis. The examination showed that the patients were about as sick as persons are with a bad cold. The duration of the attack was two days and upward. Health Officer Edson says that he has no doubt that it is real Russian influenza.

THE PROCESS OF DISINFECTING CLOTHING.—Clothing which requires disinfecting should be submitted for about three hours to a temperature of 250 degrees in a chamber charged with sulphuric fumes from a large quantity of sulphur. The chamber should be so constructed as to prevent the fumes from passing out. No germs can stand this. After a room has been used by a person sick with any contagious disease it becomes necessary to disinfect it before it is fit to be used again. This is done by removing and burning the paper on the walls, removing the bedsteads and other furniture and exposing them to the air and wind, and giving them a fresh coat of varnish; by having the mattress made over new and the hair boiled; by burning in the room three pounds of sulphur, and by whitewashing, painting and papering the room anew.

THE SUN CURE.—Mrs. Mona Caird, the woman who distinguished herself by trying to get at the world's family affairs through asking if marriage is a failure, is now in Austrian Tyrol undergoing what is called "sun cure." This sun cure has been described as a very pleasing remedy for whatever ails you. It consists in drinking grape wine with a bead on it until you don't know whether you are a sick man or an inflated balloon. Then you sleep it off in the sun, and when you wake up and ask for a monkey-wrench to screw your hat on with, they give you another treatment. We have it from persons who have tried it that next to taking dinner with Chauncey M. Depew it is, for the time being, the most effective cure that has been devised since the good old days of Medford rum in New England.—*Washington Post.*

BACILLI IN NEW-LAID EGGS.—New-laid eggs are supposed to form the perfection of food both for invalids and persons in good health, the former especially. But even they are liable to be invaded by bacilli. A writer in a foreign science weekly has discovered that the red coloring sometimes, although rarely, found outside the white of a fresh hard-boiled chicken's egg, after taking off the shell, is due to a microorganism. He tried to cultivate it, and succeeded. A potato substratum was in a short time covered by an intense growth of *Bacillus prodigiosus*. We thus have here a bacillus inside a fresh egg, which withstood being boiled for a certain time without its vitality being in the least impaired. The lesson to be drawn from this experience is never to eat an egg, however fresh, which has a reddish tinge in its white.

SALT-WATER BATH GOOD FOR THE EYES.—Once or twice a week, at least, bathe the eyes in salt and water; and occasionally, where the eyes are dull, a little orange-peel juice squeezed in them at night will give them brilliancy without injury. Belladonna only as a beautifier should be absolutely avoided. It gives a large brilliant look to the eyes for a time at the expense of every healthful function. Oculists are occasionally compelled to use it, but except when under the care of a specialist it should never be touched. Never strain the eyes on rising. Do not read before eating. Tired eyes may be bathed in a solution of alum and rose-water, and an early sleep be taken to restore their brilliancy.

A NEW MEDICINE SCRUB.—It has been ascertained that the berry grown on the Florida scrub palmetto has medicinal qualities. It has a soothing effect on the mucous membrane, producing pleasing sensations in the throat, and relieving soreness, coughs, catarrh and cold in the head. It is also beneficial in kidney trouble.

THE FRUIT OF INTELLIGENT OBSERVATION.—While strolling through the Paris Exhibition, it is said Mr. Edison accidentally hit upon a tool that he calculates will save him something like $6000 a year. It is a chisel worked by hydraulic pressure and will enable him to reduce his labor by 18 hands.

USEFUL INFORMATION.

WOOLEN GOODS RUSTLING LIKE SILK.—There is a little Yankee dressmaker in an Eastern city, who, according to a local paper, has just evolved a new and lucky idea, and is thriving on it already. When ladies come to her with the goods to make up an ordinary worsted dress, she asks: "Will you have it made to feel like silk or wool?" Then the owner of the dress naturally inquires into the meaning of the question. "It's all in the lining. I can give you a lining that will rustle like silk when you walk along the street, and that will make you think whenever you touch it that it is silk, and it will only cost you 30 cents a yard." "Oh, no," the economical dresser says, "I cannot afford it." "Then you will have a lining at six cents a yard without any frou frou?" the little dressmaker despot says in disapproving tones. But the fancy of the patron is caught by the alluring prospect of having her woolen dress rustle like silk, and she leaves an order for this cloud of silver lining. And the catchy little device is a success of the art.

A BEET-SUGAR FACTORY FOR SAN BERNARDINO COUNTY.—According to the Los Angeles *Herald*, arrangements have been completed to put up a large beet-sugar factory at Chino, San Bernardino county. The main building will be 350 feet long by 100 feet wide, and six stories high. The plant will cost $300,000. The American Sugar Co. of this city is backing the scheme. It is to be a crude-sugar factory and refinery combined. The same authority says that another crude-sugar factory will be built at Anaheim, and a third at some other convenient point, both in Los Angeles county, to furnish the crude material for the Chino refinery. The sugar-beet industry of this State is no longer problematical, and no part of the State possesses greater facilities in the way of soil, climate and facilities of transportation than do Los Angeles and San Diego counties.

COVERING TUBERS AND ROOTS IN PILES.—M. J. Byrne writes us that he finds the old-fashioned way of storing potatoes, turnips, mangolds, etc., as practiced in Ireland, succeeds well here. The vegetables should be dug, allowed to lie a few hours, not a few days, as is too often done here, which results in injury to the vegetable by prolonged exposure to the sun. Pile in long piles, four feet at the base and tapering to the top. Cover with straw or rushes and then with a foot of earth. Sometimes openings are made at the sides to allow access of air to prevent heating. The leaves are removed from the beets and turnips except that those on the outside rows are sometimes allowed to retain the leaves. Roots thus buried, keep well from October to February.

YOUR OWN WEATHER PROPHET.—When a storm is advancing, the wind blows to meet it. Thus a wind blowing from the east or southeast indicates a storm from the west. When the storm center has passed, however, the wind changes and follows the storm. If a person has a good barometer and a wind-gauge he can tell pretty correctly when a storm is coming. Without the instruments the clouds may be watched, and when seen to be moving rapidly from the southeast, and there are indications of the presence of much moisture in the air, a storm is not far away.

COTTON DUCK FLOUR BARRELS.—Telegraphic advices from Atlanta, Ga., speak of a possible revolution in flour-barrel making growing out of the granting of a patent for the making of barrels out of cotton duck instead of wood. According to the telegraphed account, "the new material is impervious to water and resists fire for a long time. It weighs to the barrel about 15 pounds less than wood, and can be manufactured 10 per cent cheaper. The cotton duck barrel can be rolled up into small space and returned to the mill for frequent use. The barrels can be thus returned as solid goods, and thus save space."

WHAT CANNED GOODS HAVE DONE.—Furnished the masses with cheap and healthy articles of food; helped the grocer to increase his business and add to the appearance of his store as well as to his profits; increased the pleasure of the table in seasons when fresh fruits and vegetables are unobtainable; it has lessened the labor of the housewife, as canned goods need but little preparation to serve them ready for the table. It has given labor to thousands interested in their manufacture, and rich and poor alike enjoy at moderate cost these productions.

HAND GRENADES for the extinction of incipient fires are now found in corners and corridors of many public and private buildings, and their efficiency if used with promptness is generally admitted. There is no necessity, however, for paying fancy prices for them, as ordinary bottles filled with the solution will answer every purpose. The solution is composed of one pound of common salt, one-half pound of sal-ammoniac, dissolved in about two quarts of water, and so such simple means of fire prevention may readily be made by any one.

HOW TO DETECT COUNTERFEIT BILLS.—Take a United States bill of any denomination and hold it up to the light, and you will see two lines running across it lengthwise. Upon examination you will find these to consist of a silk thread, a red and a blue one. Every genuine bill has this mark of genuineness. Without these marks a bill may be put down as counterfeit, no matter how good the engraving on it. No paper-mill dare make that sort of paper, and that is the Government's only protection on its currency.

A NEW THING ON RATS.—A Nashville druggist prepared a rat paint made of a preparation of phosphorus. Catching a rat, he painted him with the preparation, and after dark, when the rodent was gleaming like a fireball, he turned him loose to mingle with fellow-rats. Dire consternation came upon them when he appeared, and they incontinently fled, the phosphorescent rat bringing up the rear. Would it not work equally well with squirrels and gophers?

AFRICAN IVORY.—Stanley brought with his expedition to the coast 31 tons of ivory from the Upper Congo region. A portion of that ivory has already reached Europe and been sold at Antwerp for parties in Sheffield, England. The large tusks are said to be very fine, and at the sale prices ranged from $325 to $425 per tusk. Thirty-one tons at the latter figure would amount to $263,500.

THE ENGLISH SPARROW.—"The day is not ten years distant," says a scientist, "when the United States will be damaged more by its English sparrows than by all the weevils, cutworms, crows, blackbirds, rabbits, hawks, fleas, bees, motar curculio, droughts or floods. He could not to-day be got rid of for $5 000.000 in cash. He damaged us last year $25,000,000."

CORN OIL is expressed from the germs of maize which are separated in making starch. They yield a sweet, non-drying, creamy oil which is excellent for liniments and other pharmaceutical uses. At Forestville, Ct., these germs are separated and canned, and make a delicious food which is sold under the name of "Kornlet."

SIX DYNAMITE GUNS are now being constructed by the New Jersey Steel & Iron Company of Trenton, N. J. The guns are to be 50 feet long, 11 inches in diameter, and will be made in three sections. The guns are to be completed by January 1st next.

A HEAVY CASTING.—An iron cylinder weighing 24,000 pounds and measuring 14 feet in length by 5½ feet in diameter was cast at the Fulton Iron Works in this city, on Tuesday, the 17th inst., for the North Pacific Railroad Co.'s new ferry-boat.

COPPER VESSELS which have become coated with black can be effectually cleaned by scrubbing with fine sand. Dilute nitric or oxalic acid is efficacious, but both are poisonous, and should be used with care.

WHERE PERFECT GLASS IS MADE.—The French factory of Mantois is the only one in the world where glass large and perfect enough for the lenses of a big telescope can be successfully cast.

ELECTRICITY.

Danger from Electricity.

That Boston should have been seriously scorched on Thanksgiving Day by the undue energy of crossed electrical wires argues nothing against the use of the electric fluid as an illuminator or mechanical motor. It simply indicates the imperfection which attends the introduction of all dangerous systems into social life, but which the age of improvement will in time render innocuous as their nature becomes better understood. Lives have been sacrificed and property burned, and there will be more of these disasters until the time arrives when proper safeguards, born of these rude experiences, will be adopted and life and property will be no longer jeopardized.

If all sorts of wires are run in all sorts of ways about a city, and by persons who are not thoroughly versed in the science of the business, and at a time, indeed, when the full knowledge of the full dangers of the business has not yet been learned by any one, it need not be thereby assumed that such use of electricity cannot be safely made. The headlong energy of the authorities of New York in cutting down poles and destroying wires at a time when the agents and owners are honestly and earnestly striving to remedy the evils and dangers of the wires, is not wise. A careful, candid study of the situation to trace the cause of the accidents, with a view to remedy the evil, would be much more to their credit. The very small number of such accidents in the whole world during the existence of these necessarily fatal systems certainly indicates that the problem is comparatively simple. By using high-class insulated wires such as are already largely in use, and by planning circuits so as to prevent such snarls as now exist, the danger can be almost entirely removed. Some accidents are bound to happen just the same as in other industries in our crowded cities.

As well might we make war against the use of gas because 15 people "persisted in absentmindedly blowing out the gas" in the city of Chicago in the year 1888. Fortunately the scarecrow articles of a few interested individuals cannot block such an industry in this country, and we may, therefore, look forward to the establishment in the near future of much larger and more numerous installations for the distribution and use of electricity. The first Atlantic voyage of Columbus was a hazardous and fearful adventure; a voyage to Europe is now a safe and pleasant pastime. "Time conquers all things" in more senses than one.

ELECTRICITY IN POWDER MILLS.—The German technical journals have recently published some instructions as to the precautions which ought to be observed in powder-mills to prevent explosions attributable to electricity. In a large powder-mill in Germany an explosion lately occurred in the press-room. A workman engaged in pressing powder into cakes between sheets of ebonite left his work during a thunder-storm. When the storm was over he loosened the press, and, on putting out his hand to remove the powder, a spark four inches long went through his body, igniting the powder and killing the man. The employment of insulating substances, such as gutta-percha, ebonite, etc., is therefore considered as liable to lead to accidents. In one of the principal powder-mills of Germany the sulphur-crushing machines are all put to earth; and since this precaution has been taken there has been no trouble from the mysterious explosions which had previously proven so troublesome.

AN ELECTRIC PENHOLDER has been devised which contains a thermo-pile, which means pairs of metals of the thermo-electric scale, such as copper and German silver. When the pen is in use the thumb and fingers form a connection, and the heat generated by the hand induces a current of electricity, as the inner joints of the elements of the pile will be cooler than those which are exposed. This current passes through the fingers and thumb, and is advantageous in preventing pen-paralysis. By sliding along the metallic ring, so that it will make contact with the exposed portions of the thermo-pile, a shunt is effected which prevents the current from passing through the hand. The device was invented by William C. Holmes of Waterbury, Connecticut.

ELECTRICITY TO PREVENT ACCIDENTS.—A very useful electrical invention, tending to lessen the possibility of accidents in factories, is now being extensively adopted in Leeds, Eng. The breaking of a glass, which is adjusted against the wall of every room in the mill, will at once stop the engine, an electric current being established between the room and the throttle-valve of the engine, shutting off steam in an instant. By this means the engine was stopped at one of the mills recently in a few seconds, and a young girl who had got her clothes entangled in an upright shaft was released uninjured.

ELECTRIC LIGHTING is said to be one of the hardest kinds of work for a steam engine. The continuous running and the work being thrown on and off instantaneously cause an immense strain.

MINING AND SCIENTIFIC PRESS.

A. T. DEWEY. W. B. EWER.

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Business Announcements.

[NEW THIS ISSUE.]

Building For Rent—Chas. Ashton.
Dividend Notice—S. F. Savings Union.
Dividend Notice—German Savings and Loan Society.
☞ *See Advertising Columns.*

Passing Events.

The heavy rains have continued all over the State, causing considerable damage to lowlands, railroads, bridges, etc. More rain has fallen for the season than has ever been experienced since the settlement of California.

The Government engineers have been examining the Sacramento river with a view to its immediate improvement, but if they are reported correctly, they think it wiser to wait for a low stage of water.

The starting up of the new $150,000 reduction plant of the Eureka & Excelsior mine at Cracker Creek, Oregon, marks an era in that section. The mill is a most complete one, as the brief description in our "Mining Summary" shows. The mine belongs to Eastern people who have invested a large amount of money in the property.

The Anti-Debris Association has passed a resolution, published in another column, asking the Secretary of War to expend the appropriation made some years since for the improvement of California rivers. The appropriation was withheld by the Secretary until hydraulic mining should cease. Congress has already passed a joint resolution ordering the expenditure.

The horrible accident by which 16 miners lost their lives in a mine at Angels, Calaveras county, is the worst that has ever occurred in the history of mining in this State.

This number of the PRESS marks the close of a volume—a very good time, by the way, for new subscribers to send in their names for the oldest mining paper in the United States.

Close of Volume LIX.

The MINING AND SCIENTIFIC PRESS is the only paper devoted to the mining industry in the United States which can truthfully put Vol. LIX in its heading, since it is by far the oldest of such publications. It has recorded the growth of the precious-metal industry in this country and progressed with it. When the first number of the PRESS appeared, gold and silver mining was confined to a few places in the Pacific States, while now the whole region has mining camps scattered over it.

Growing as it has with the mining interests, and devoted to practical mining matters, the PRESS is of every-day use to its subscribers, all of whom can gain from its columns more or less information to be applied to their work. Aside from this specialty, more or less mechanical, industrial and scientific news is to be found in its columns every week, and many miscellaneous subjects are treated, as the complete index on the last page will show.

During the past year the number of illustrations has been largely increased; 20 pages are printed weekly in place of 16, as formerly. This increase in size has been found necessary in order to make room for more reading matter.

While the end of the volume is a good time for old patrons to renew their subscriptions, it is also a suitable period for them to call the attention of others to the merits of this journal. The PRESS has always been devoted to the welfare of the practical mining community and publishes that which is useful and interesting to them. New methods, processes and machines are fully described or illustrated, so that each may know what others are doing. The publishers and editors spare no trouble in gathering information from all sources and presenting it in readable shape. It is their aim to constantly improve the paper and make it more valuable to its readers.

Before the next number of the PRESS appears, 1890 will have commenced, so that we may take this occasion to wish our patrons all a "Happy New Year."

More Mineral Land Gone.

A dispute involving mineral and pine lands in Northern Wisconsin, worth over $1,000,000, has been decided by the United States Land Office. The Cranberry Lumber Co. of Saginaw, Mich., the Musser Sauntry Land, Logging & Manufacturing Co. of Muscatine, Iowa, and the Superior Lumber Co. of Mason, Wis., filed notice of intention to offer final proof on certain lands aggregating 20,000 acres. F. M. Dudley, land attorney of the Northern Pacific railway, and W. F. Shea, attorney for the alleged settlers on the land, appeared and presented a protest. The land officials declared the lumber firms mentioned above had established their ownership and filed their final proof.

Among the lumbermen, the agricultural claimants and the railroad companies, if this sort of thing goes on, it will not be many years before most of the mineral lands belonging to the Government will be in private hands, and miners will have to buy their mining ground from lumbermen, farmers or railroad companies. It seems that in all these questions the miners are beaten, the corporations getting the best of it in most cases. The recent decision of Judge Sawyer of this city is a most unfortunate one for the miners of California, and though it must still be passed on in the U. S. Supreme Court, it looks as if the railroad company had the good end of the bargain.

LABOR REFORM AT HOME.—The N. Y. *Journal of Commerce* thinks that the labor reform really needed is the emancipation of the women of the laboring men's families from the slavery of 14 to 16 hours of daily work in the household, and that the demand for reducing the *men's* working time to eight hours has no justice in it where those men do not reduce the much longer working time of the women of their own households, and it calls upon all members of the Federation of Labor to begin a labor of reform in their own homes.

Important Suit.

Leading members of the Mining Stock Association of this city deserve more than passing credit for the persistent and efficient manner in which they have prosecuted the action brought by Smith et al., stockholders in the Kentuck Mining Co. of Gold Hill, Nev., against Palmer et al., including ex-Governor Stevenson of Nevada, for a full accounting under a contract made with Stevenson in 1882, for a royalty upon the ores of the Kentuck mine, situated in Storey county, Nev. Upon the result of this action probably more than upon any one thing else hinged the certainty that many of the abused stockholders in several of the mines on the Comstock lode, Virginia City, will, through the courts, have much of their money refunded. Not only will this be the case, but the badly abused mines can and doubtless will be made to be managed more upon a business basis. The way in which many of them have been conducted has been outrageous, and of such a character as to keep honest investors of large means from putting money into their shares. So flagrant have the abuses been carried on that it looked as if the officers of the companies have grown into the belief that they were above the law and that the rights of stockholders are in no way to be considered. It required just such an action as the one cited above to bring them to a realizing sense of their true position, so stockholders can have their interests looked after, and failing to do this, then the latter can put other and far more competent men into the management of the mines.

Lead Ores and Congress.

So much public attention has been called to the injustice of the ruling of the Secretary of the Treasury which admits lead ores free of duty into the United States from Mexico and Canada, that Congress is bound to take action this session. Mr. Bartine of Nevada has offered the following concurrent resolution in Congress:

WHEREAS, By paragraph 188 of the Tariff Act of March 3, 1883, it is provided that there shall be levied and collected on imported lead ores a duty of 1½ cents per pound; and

Whereas, The Secretary of the Treasury, in construing said paragraph, has ruled that when such ores contain a greater value in gold or silver, they shall be classified as gold and silver ores, as the case may be, and admitted without payment of any duty; and

Whereas, Under said ruling many thousand tons of lead contained in such ores are annually imported into the United States free of duty, whereby the Government is largely defrauded and the lead-producers of the country are deprived of that protection which the law was intended to give them, and are subjected to the injurious and great destructive competition of the peon labor of Mexico, in consequence of which the lead-mining industry of the United States is greatly depressed and in danger of utter ruin; therefore,

Resolved, That it is the sense of Congress that any ore which contains lead in sufficient quantities to make it valuable for commercial or industrial purposes is a lead ore within the meaning of said paragraph 188, and the Secretary of the Treasury is hereby requested to modify his said ruling accordingly.

Of course the great smelting companies of the Southwest, which have been making piles of money under the existing Treasury ruling, will try to prevent any legislation of this kind, and as they have great influence, it will be necessary for the miners and their friends to keep agitating the subject if they wish for any relief from the present situation.

Recording Mine Labor.

The mining laws of the U. S. do not require the recording of labor affidavits for annual work performed on unpatented locations, but it is customary, nevertheless, to do so as a matter of precaution. In case of a sale of the property the title is more easily proved and illegal relocations are easily beaten. As soon as the annual labor is completed, it is much better for those who have done it to make affidavit and record it with the recorder of the district. If the mine is in a region where there is no district recorder, the recorder of the county may be applied to.

It is just as well to comply not only with the letter of the law but the custom of the miners in such cases. It is a very simple matter to make record of the work done and involves only a trifling expense. Where men have partners who do not do their share of work, it is necessary to advertise the delinquents in order to get rid of them. While it is not necessary to advertise the completion of necessary annual expenditure work, it is the part of wisdom at least to make a record of the fact that it has been done.

The Mine Accident at Angels.

On Sunday evening last a disastrous cave occurred in the Utica mine, Angels, Calaveras county. A gang of nineteen men went down that evening to repair the timbering in the 400-foot level. They noticed that the side timbers were bulging considerably and had scarcely begun work when a cracking of the timbers gave notice of what was about to occur. The men made a dash for the shaft, but only three reached it. The rest were buried. A rescue party worked all night, but had succeeded in getting in only eight feet, and had not recovered any of the bodies. Superintendent Lane has written to Hayward & Hobart, owners of the mine, to the effect that the mine was considered unsafe on account of the spongy condition of the earth above the 330-foot level, and he had ordered the usual retimbering precautions taken. George Williams, the boss timberman, an old and very reliable man, went down to the 330-foot level on Sunday afternoon to retimber the portion of the mine in and about the stopes on that level. Suddenly, and without a moment's warning, the crash came, and the men were literally buried alive.

Immediately after the accident, men were lowered down the shaft, and entering the mouth of the drift, they commenced digging into the debris. They found the attempt almost useless, as the timbers seemed to have been woven together, as though the sides of the drift had fallen toward each other and had been covered by the roofing.

On the following Tuesday the surface of the mine caved down to a depth of 40 feet, and the cave extends along the vein from the north shaft to the south shaft, and is about 30 feet wide. No bodies have been recovered, and all work to recover them has stopped.

It is reported that another miner, named Carlo Duzzetti, is killed in the mine. If true, this makes the seventeenth victim. He leaves a wife and two children. Three of the other unfortunates were married.

The following is the list of the entombed miners: Tom Knuckey, who leaves a wife; Geo. Williams, who leaves a wife and four children; J. Brady, a married man whose family is not known; Nick Eucich, B. Segal, Peter Pernio, C. Bertro, Paul Owlovich, John Butoltto, John Tobocco, C. A. Pollard, Joseph Curnow, John Martin, Mitchell Brondwich, Jas. Casey, Wm. Vincent.

The names of the ones who escaped are: August Anderson, uninjured; Thomas Corwin, badly cut about the head, and Daniel Danielson, slightly injured.

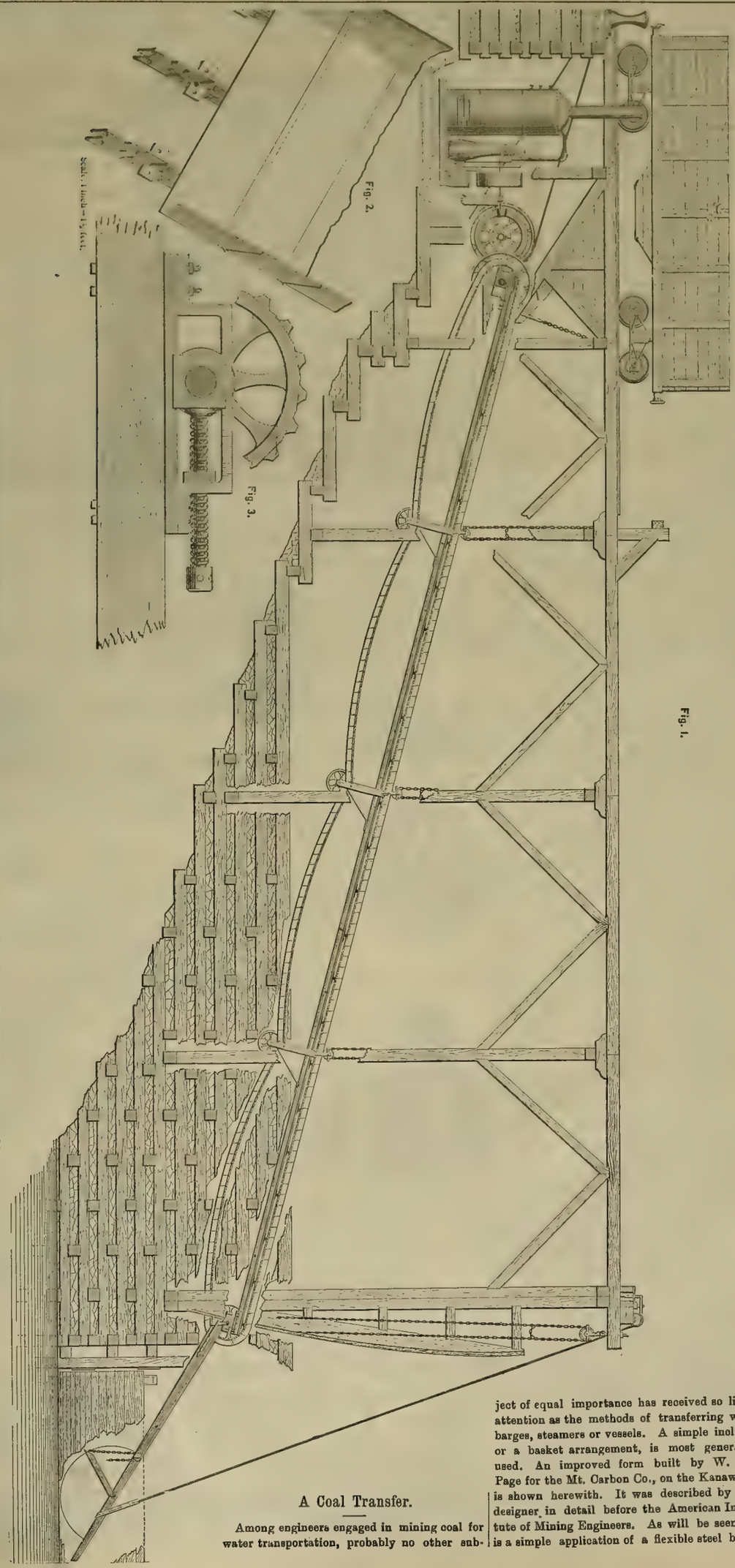
Mr. Hayward says of the accident: "The timbers in the level where the men lost their lives were strong and stout, being from 20 to 30 inches through, and the only cause of the caving is to be attributed to the complete saturation of the soil, which is of a clayey and slaty character, increased thereby in weight, and making the timbers bulge out until, with the general crash, they came together. There was no possibility of saving the men three minutes after the drift caved in, and the escape of the three men in the drift at the time was miraculous. Even as it is, we cannot do anything while this weather continues, as almost any attempt to rescue the men will be attended with great danger. I think there is scarcely a chance to find one alive, if we find them at all.

"You will understand that the ground has caved down to the 330-foot level, and from there upward. Where the cave occurred it is 530 feet, and there are two levels below.

"The elevation of the mine is from 1100 to 1400 feet above the sea level, on a partly flat portion of the ground, which, in that vicinity, has a rise and fall. The reports to the effect that the drift was 12 feet wide are untrue. It was 35 feet wide. If it had been only 12 feet wide, the accident would not have occurred."

RICH silver ore has been struck by R. F. Cunningham and J. C. King on a ledge 20 miles from Oro Grande, in San Bernardino county.

A DEPTH of above eight feet of snow is reported on the mountain ranges forming the watershed of the Carson river.



ARRANGEMENT FOR TRANSFERRING COAL FROM CARS TO BARGES OR STEAMERS WITHOUT BREAKAGE.

A Coal Transfer.

Among engineers engaged in mining coal for water transportation, probably no other subject of equal importance has received so little attention as the methods of transferring with barges, steamers or vessels. A simple incline, or a basket arrangement, is most generally used. An improved form built by W. N. Page for the Mt. Carbon Co., on the Kanawha, is shown herewith. It was described by the designer in detail before the American Institute of Mining Engineers. As will be seen, it is a simple application of a flexible steel belt, four feet wide, with six-inch flanges, and 95 feet from center to center of sprocket shafts. The drawing is on a scale of one inch to ten feet. The three chains are made of steel bars. Each alternate link has a two-inch flange to which is bolted a segment of the belt, as shown in the detail drawing; consequently, every other link is an idler, which increases the flexibility of the link. The segments are made of No. 12 gauge soft steel, and lap three-fourths inch. The lower lap is curved downward, for which the idle link is notched.

The hopper under the car holds less than a ton, consequently, the belt practically draws the coal direct from the car after the hopper has been once filled. The feed apron is narrower than the belt and is adjustable so as to feed automatically, the coal on the belt regulating the change. The feed is regulated to any desired load, and no attendant is required. The links of the loaded chain run in small flanged rollers, placed every few feet on six-inch girders, 24 feet in length, with fish joints at every point of suspension. It will be seen that there are four such points within the 95 feet, for which have been used eight two-ton differential blocks, four on each side. Blocks were cheaper than counterweights.

The total weight of belt and attachments, exclusive of the upper or fixed shaft and sprockets, is five tons; and the level load is five tons; consequently, each revolution of the belt conveys a little more than ten tons. The arrangement for returning the empty portion of belt consists of three pulleys, 2 feet in diameter by 12 in face, set on the shaft so that each pulley supports a chain. To suit the different stages of water, the entire system can be readily raised or lowered at one end by one man, care being taken to have the girders in line when the proper elevation is reached. The guide on the movable end is an arc of the circle to which the belt is radius; though to cover any inequalities or spring in the timbers, the fixed ends of the girders are provided with movable connections to the main shaft, which is also provided with extension-boxes, to facilitate making the connections. The chute which distributes the load in the barge is built of light steel, arranged so as to convey the coal to both sides at the same time, the proportion delivered to either being regulated by the angle of inclination. It is adjusted so that the coal moves in it very slowly, and has a minimum drop into the barge. When the sides have been fully loaded the hinged apron is folded back, and the discharge falls in the center of the barge, which is thus loaded so as to require little or no leveling.

In describing this Mr. Page says: "It is apparent that the greatest inclination of the belt should not exceed the friction-angle of coal on iron; and that, within certain angles, gravity will revolve the belt, on the principle of an ordinary incline. Though I put a brake-wheel on the main shaft, intending at the time to use gravity-power, I determined later to make use of a small 6x8 inch engine, which was on hand to operate a capstan for handling the barges. I connected the belt with it and made the greatest angle of inclination only 15 degrees. The belt is speeded to 100 feet per minute—the engine making 150 revolutions—and makes a complete revolution in a little less than two minutes. In actual practice, the belt empties a 12-ton car in two minutes, or at the rate of 360 tons per hour. This capacity can be increased without additional expense by simply increasing the speed of the belt, or, at a very small additional cost, by increasing its width.

"As the belt has never been operated by gravity alone, I am not able to say exactly what the factor of friction is, but am satisfied that it will revolve between the angles of 10 and 20 degrees; or in other words, it can be operated by gravity alone."

The little engine mentioned will run the loaded belt without difficulty in a horizontal position. The total cost of this appliance was $5600, including engine, capstan and all gearing. In actual working, only two men are required to run this conveyor to its full capacity, an engineer, who also attends the capstan, and one man in the barge. The trainmen dump the cars. The tracks are arranged so the loads run in, and empties out, on down grades.

Apart from the advantages already named, it has been clearly demonstrated that both coal and coke can be put in barges with half the breakage of any other arrangement; that there

is nothing complicated to get out of order; that, as the barge sinks in proportion to the load, the belt has to be moved only for the different stages of water. Moreover, there is no danger to life or property from the breakage of any part, as is the case with the vertical system, in which the breaking of a rope may cause the loss of life, barge and car. With self-dumping cars, this machine could transfer 4000 tons in 12 hours, at a cost of about two-tenths of a cent a ton.

Fresno County Mines.

[From Our Own Correspondent.]

Grub Gulch.

Entering the county from Mariposa county via Grant's Springs, the first mines encountered are those at Grub Gulch. Here the Josephine is running 20 stamps on rock reported as averaging $10 to the ton. The Gambetta is running a roller-mill on rock that the owners claim will excel that of the Josephine. The Crystal Springs mine is idle. The ore here is free gold and sulphuret. Just over the hill at

Coarse Gold Gulch

Is the Flying Dutchman, with a 100-foot shaft on a four-foot vein of quartz carrying free gold and sulphurets of a value of from $8 to $70 a ton, by assay. There is a slate hanging and granite footwall. The mine is located on the south bank of the Fresno river, and, in consequence, free water for power can be secured for seven months in the year and water for batteries and boilers all of the year.

Texas Hill.

This mine is the property of J. B. Haggin & Co., and while it is known to be a valuable property by reason of over $40,000 having been expended on it in development, the owners content themselves, for the present, with keeping out the water. Once this mine is put in operation, Coarse Gold Gulch will soon come to the front in quartz mining.

Hawkeye.

Numerous tunnels up to 700 feet in length have been run on this mine, showing a vein 30 feet in width. The 5-stamp mill is idle at this time, but drifting is going on steadily.

Last Chance.

This mine has a 10-stamp mill, and the owners have drifted 500 feet on the vein. Mr. Hearst offered the owners $30,000 for the property.

Quartz Mountain.

Owing to the stupidity of a Portuguese, I did not get to see the superintendent, but learned from others on the mine that the company had expended some $80,000 on a ditch and a far larger amount in improvements, while the developments consist of a 60-foot tunnel. They have a fine class of improvements and a good 60-stamp mill. The property is owned by a French syndicate, and it is reported that a reorganization is about being effected, when the mine will be thoroughly developed, and this mountain of quartz made to give up its golden treasure.

Mt. Raymond.

The Shaw Mining and Reduction Co. of Helena, Montana, has a fine plant on their property, capable of reducing 120 tons a day, which is idle at this time. The plant will be reconstructed the coming season, so as to save a greater per cent of the value of the ore, which is silver, bearing a large percentage of galena.

Hildreth.

This camp "looks like one forsaken" at this time. The Abbey closed down on the 11th of September, and the miners closed out soon after. In the Abbey there is still 300 feet of backs above the upper level, which may be worked at some future time. In the time of her successful running the 10 stamp mill turned out $8000 to every stamp each 10 days. The mine has been developed to a depth of 700 feet. The vein holds its size, but its character changes from gold to silver as depth is attained.

Morrow Mine.

This property is owned and operated by the first owner of the Abbey, Mr. J. Morrow. On the Morrow an incline shaft has been put down 235 feet, on a vein of an average width of 14 inches, and an average milling value of $33 in free gold. The footwall is slate; hanging-wall, porphyry. A drift of 140 feet has been run on the 100-foot level. The 5-stamp mill is pounding away right merrily.

Auberry.

The old "Harron Mine" is astonishing its present owners by the character of its ore. This property was bought for $250 and shows in the two incline shafts of 103 and 115 feet an average width of four feet to the end of the 135-foot drift which carries a pay streak 18 inches in width that "arastras" $60 to the ton. The entire vein is good $40-rock. For want of sufficient water the present owners confine themselves to the two arastras. The vein is in granite, but is free on its walls. Numerous locations have recently been made on the course of the vein and all show free gold in paying quantities. I did not get into Fine Gold in consequence of the storm and almost impassable roads for which Fresno county is deservedly famous. At Kings Creek the snow was reported as being eight feet in depth, and I was compelled to pass that section by. From what I could learn of this much-boomed section, its safety lies in its being inaccessible. Reliable citizens state that the ores are base and of only moderate value.

In Fresno county the mines, as a rule, are owned by what the miners term "Alfalfa Miners," who are similar to the "Pumpkin Miners" of Colorado. These men, while very good citizens and, no doubt, successful farmers, are entirely out of their element in mining. They want the results first. In consequence, they gouge out a bunch or swell in a shoot and when the bunch gives out or the vein pinches, they stop. There is no development and no ore reserves, and in consequence a very small measure of success. That the mines do as well under the circumstances is to the credit of the mineral section of the county.

E. H. SCHAEFFLE.

Coast Industrial Notes.

THERE has been quite a falling off in the amount of lumber cut in the Truckee basin the past season. The causes of this were several. The low state of the water was a serious drawback to the millmen. For this reason the Truckee Lumber Co. was unable to drive many logs and the other mills could not flume lumber. This caused them to suspend operations early. Then the demand for lumber has not been as heavy as usual. The Verdi mill of the Truckee Lumber Company did not run, we understand, because of some litigation over the property. The cuts of the various mills are as follows:

Lewison & Smith	3,000,000
Truckee Lumber Co.	3,000,000
Elle Ellen	3,500,000
Geo. Schaffer	5,500,000
O. Lonkey	3,000,000
Boca Mill Co.	7,000,000
Pacific L. & W. Co.	5,000,000
Essex Mill Co.	2,500,000
Richardson Bros.	3,500,000
Total for season	36,000,000

AN IRON CYLINDER has recently been cast in the shops of the Fulton Iron Works, which is intended for a ferryboat to be constructed by the San Francisco & North Pacific Railroad Co. It has only one equal in size in use on the ferryboats on the coast. It is 14 feet in length, 5½ feet in diameter, and weighs 24,000 pounds. The machinery for the new boat is the largest ferryboat machinery ever manufactured in the shops of the Pacific. From the bottom of the bed-plate to the center of the beam is a distance of over 41 feet. The new boat will probably be ready for use some time in the spring.

A DISPATCH from Tacoma dated Dec. 16th says: The Ryan smelter, which is approaching completion beyond Oldtown, changed ownership to-day, being purchased by Denver and Tacoma capitalists. There has been some delay in completing the work, owing to negotiations for the purchase of the immense plant. Hearing this, and to further the project, President Thos. F. Oakes of the Northern Pacific Co. wired that it would be necessary to secure $50,000 of the required stock in Tacoma. Within half an hour after the telegram was received, the amount had been taken up here and the sale was closed. The work under the new management will be pushed as rapidly as possible, and it will not be long until the smelter is finished and at work.

IT is stated that Los Angeles capitalists have recently visited Stockton to purchase 300 acres of property outside of the city limits, the price to be about $250,000. Twenty-five thousand dollars has been paid down on the trade. The purchasers refuse to say what they will do with the tract, but it is believed that manufactories will be erected to use natural gas for fuel. Four Sacramento capitalists, with Civil Engineer Grunsky as expert, have visited the Stockton natural-gas well to gain information for a syndicate which was recently organized to bore for gas in Sacramento.

THE California State Co.'s quarry, Chili Bar, two miles from Placerville, El Dorado county, is now opened up in good shape, and they are taking out large quantities of slate daily. The first gallery (they work in galleries or benches) they opened is now so far advanced as to allow the working of the lower gallery. For this purpose they have run a tunnel 100 feet long, which is 80 feet lower than the gallery opened. This gives them a hight of 120 feet of solid slate, 80 feet wide at present and widening out every day. The slate is of the finest quality and texture, and is in great demand. They are now preparing to increase their force of slate men and fill some of the large orders on hand, some of which are as high as 700 squares. Mr. Bind has completed a large water-wheel to run the trimmers, saws, and other machinery which is now in course of erection.

IT is reported that the Sierra Lakes Ice Co. propose to put in an extensive electric plant at its works at Prosser Creek. There is an abundant water-power at that point which can be easily applied to the above purpose. We understand that the light will be used in connection with the ice business. When the ice harvest is in progress it is usual to work at night as well as day, and the light will be distributed so as to illuminate the ponds and houses. Wires will also be extended to Boca, and the company's works there will be similarly lighted.

R. A. PINROSE, Assistant State Geologist of Arkansas, has been examining the manganese deposits on O'Banion's place, Mark West Creek, Sonoma county, with a view to developing them.

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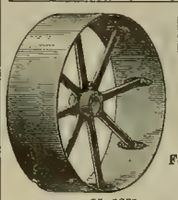


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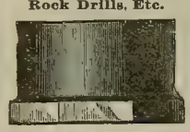


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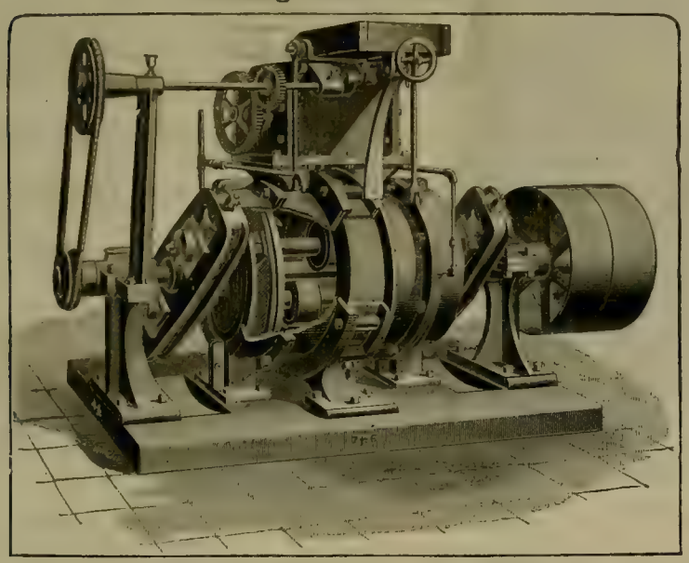
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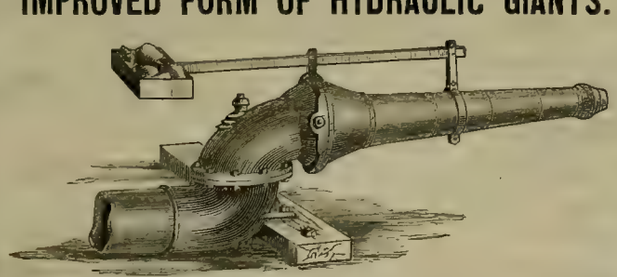
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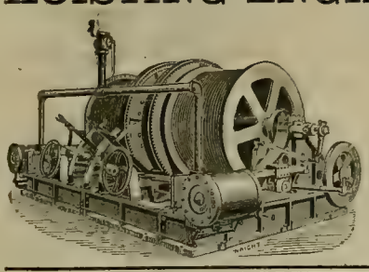
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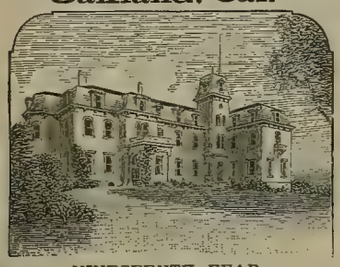
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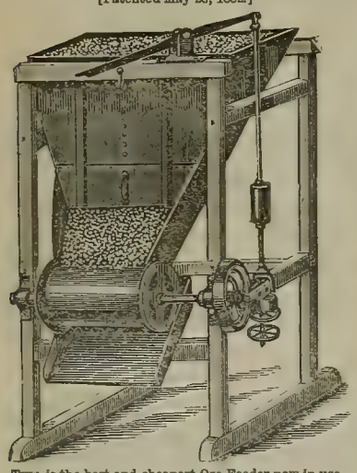


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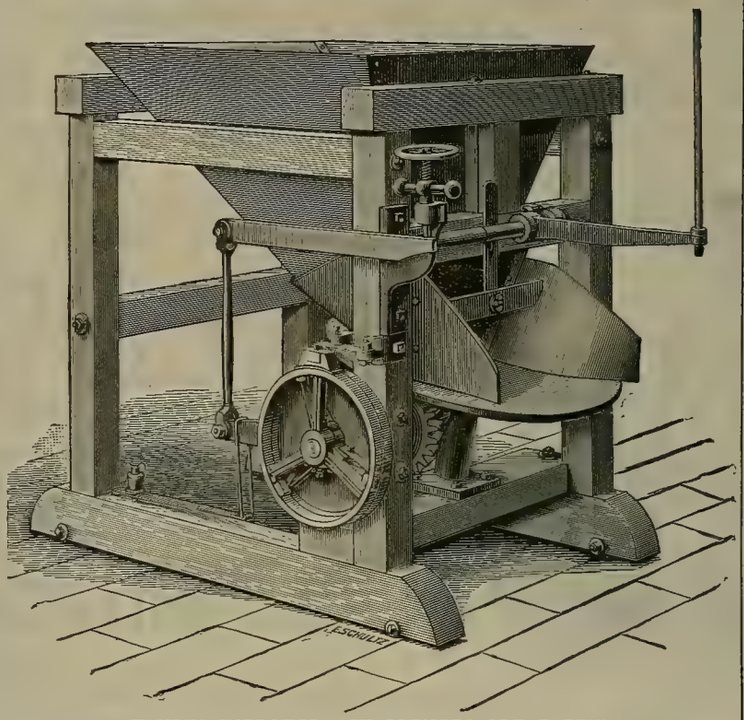
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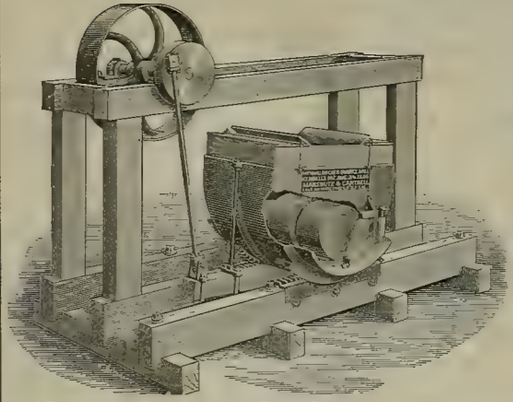
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The Centrifugal Auxiliary Propeller.

(Concluded from page 483.)

To give either of them two knots per hour extra speed with their present screw propellers would require 10,000 horse-power extra, or to give 21 knots per hour would require 28,000 horse-power.

Now, it is claimed for the Auxiliary patent propeller that its application to the stem of either of the above vessels, without altering the screw propellers, would give a speed of 22 knots per hour, without requiring any extra horse-power.

The inventor also claims that with an increase in horse-power in proportion to the cube of the velocity, this invention will increase the speed of either of those ships up to 50 knots per hour.

The scientific principles on which the invention is based are such as can only be required at high speeds. The purpose is to excavate the water ahead of the ship by the high velocity and keep it back by the centrifugal force of the revolving fan.

It has been demonstrated by the late William Froude and his son Edmund that in speeds up to seven knots per hour the principal, in fact almost the only, resistance to a vessel moving in still water is what he calls skin friction. That positive discovery led to improvements in the forms and rubbing surfaces of ships, and assisted greatly in making high speeds possible, but both they and every other naval architect who experimented on the subject of resistance to ships moving through water have acknowledged that at speeds beyond 10 knots per hour there is a resistance which is not skin friction, which increases at an enormous rate with the increase of speed, and the exact law of that increase of resistance is still a doubtful question. Sir William Thomson, the greatest authority of the day on moving forces and resistances of any kind, mechanical or electrical, has brought his great talents and all the vast powers of mathematical analysis to bear on the subject, and he still leaves it an open question: so that at present no living man can give the exact law of the increase of resistance to bodies either partially or wholly immersed in water, at speeds above 20 knots per hour.

The wave theory of resistance (due to the experiments of Scott Russel) for a long time held sway, but the Froudes and others have relocated that theory to its proper place. It is well known to every one that a vessel moving through water produces waves. Scott Russel's theory was that the waves due to displacement are of two kinds:

1st. Wave of translation or great wave, which William Froude called a diverging wave.

2d. Wave of oscillation, called also a transverse wave.

Of these two waves Scott Russel said the great wave was the only wave of resistance, but Froude by the most careful experiments has proven that the wave of oscillation or transverse wave, as he called it, produces in some cases even more resistance than the diverging waves.

Scott Russel's formula for resistance to bodies moving in a boundless ocean is the same as if the body was stationary and the ocean moving and is expressed thus:

$$P = f \frac{v^2}{2g} \triangle r$$

Where P = Hydraulic pressure or resistance.
f = Form of surface = 1 40 to 1.80.
v = Velocity.
g = Gravity.
$\triangle$ = Area.
r = Density of liquid.

The above formula is approximately correct for slow velocities up to eight knots per hour, but entirely out at high speeds, hence the failures of the steamship Great Eastern, which was engined by Scott Russel to give a high speed on the above formula.

Col. Beaufoy in his experiments under water shows that up to angles of 50° to 60° the resistance varies with the sine of the angle of incidence. His formula is oblique resistance = direct resistance $\times$ Sine θ^2.

Raleigh, on the other hand, gives the following formula:

Let P = Direct resistance,
And P_1 = Oblique resistance;

$$\text{Then } P_1 = \frac{2\pi \text{ Sin } a}{4 + \pi \text{ Sin } a} . P = \frac{\text{Sin } a}{.637 + .5 \text{ Sin } a} P$$

M. Joessel of the French navy gives a formula expressing total front resistance in terms of the back resistance or drag. Thus:

$$P_1 = \frac{\text{Sin } a}{.39 + .61 \text{ Sin } a} . P$$

Where P_1 = Total front pressure,
And P = Total back resistance.

It has been thought by Froude, White, Thomson, and apparently by Beaufoy in his experiments, that a body such as a torpedo, wholly immersed in water, will not have the same resistance to motion that a partially immersed body has.

But as the experiments of Col. Beaufoy were carried on with bodies moving very slow, they are not at all applicable to bodies moving at high speeds. In the case of vessels moving at a speed over 15 knots per hour, neither wave resistance nor skin friction accounts for the great resistance experienced, so that we have to add to these head pressure and back pressure, both of which are due to the inertia of water.

In the case of head pressure or impact, a certain mass of water at rest has to be displaced so quickly that it has not time to form a regular wave, and at very high velocities the water ahead of the ship has to be displaced bodily, as if it was a solid instead of a liquid mass. Even at velocities not exceeding 26 knots, which Thornecroft's torpedo boats have obtained, the resistance of the water is such as to cause ("steeple-chasing") the boat to rise almost to the surface of the water. In the case of the back pressure at high speeds, the inertia of the water prevents it from falling in behind the boat quick enough, and a partial vacancy is so formed, also causing resistance.

Now how to overcome these two kinds of resistances is the problem which the inventor of the auxiliary propeller has set before himself.

Mr. Robert Stevenson, the inventor, is an engineer of 20 years' standing, having been educated at Glasgow University under the late Prof. Rankine. He has been resident on this coast for six years. He has secured patents for Great Britain and this country, and hopes by the application of the auxiliary centrifugal propeller to be able to give steamships and torpedoes a speed of 50 knots per hour, and also hopes to see the time when six days will complete the voyage from San Francisco to New Zealand.

Mr. Stevenson's idea of the action of the centrifugal propeller is that it makes a partial vacuum in front of the hull of the ship and keeps the water back like solid walls until the hull has entered, and so takes away the head resistance due to the inertia of the water and causes the ship to be pushed from behind by the water which rushes in to fill up the partial vacuum so formed in front, so that back resistance is also done away with, and by that means the speed of the screw-propellers behind may be increased without the additional loss due to slip, as the screw-propellers will be moving more or less in a mill-race.

The invention is in good hands, and it is to be hoped that we shall shortly see the fastest steam yacht in the world steaming in San Francisco bay.

Fifty knots per hour is a very high speed, but if this invention can convert a 20-knot ship into a 30 knot speed without increasing the boiler-power or the amount of fuel used, the invention will be ranked as one of the greatest of the age. It is apparently based on correct and scientific principles and thoroughly original in its conception.

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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific States.

FOR WEEK ENDING DEC. 17, 1889.

417,351.—WASH-TUB—W. H. Anderson, Riverside, Cal.
417,352.—WELL-BORING MACHINE—G. S. Bartholomew, Garvanza, Cal.
417,464.—SPRAY NOZZLE—John Bean, Los Gatos, Cal.
417,469.—ROTARY PLOW AND HARROW—L. J. Bergendahl, Pendleton, Oregon.
417,407.—ELECTRIC PEN—A. S. Cooper, Santa Barbara, Cal.
417,475.—STEAM BOILER FURNACE—W. G. Dodd, S. F.
417,476.—DRY-ORE CONCENTRATOR—M. B. Dodge, S. F.
417,549.—WINDMILL—O. H. Donley, San Jose, Cal.
417,477.—GUARD FOR CABLE CARS—P. F. Dundon, S. F.
417,552.—COLLAR-STUFFING MACHINE—C. Ewing, S. F.
417,482.—AIR COMPRESSOR—S. Guthrie, S. F.
417,559.—PENMANSHIP GUIDE—P. D. Horton, Nevada City, Cal.
417,560.—COLLAR-STUFFING MACHINE—Geo. E. Hoyt, S. F.
417,564.—BIT STOCK—A. A. Kent, San Jose, Cal.
417,648.—BUCKLE—Knapp & Cresmer, San Jacinto, Cal.
417,428.—TRICYCLE—L. Levin, S. F.
417,501.—WATCHMAN'S TIME DETECTOR—Norton & Cook, S. F.
417,504.—FENCE-MAKING MACHINE—H. T. Renton, Oakland, Cal.
417,522.—CAR COUPLING—E. F. Stephens, Austin, Nev.
417,523.—CAR BRAKE—E. F. Stephens, Austin, Nev.
417,598.—SPOKE SOCKET—J. H. Stich, Los Angeles, Cal.
417,399.—FILTER—G. A. F. Streuber, Oakland, Cal.
417,301.—KNAPSACK—C. D. Weldon, Mica, Washington.

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Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

WATCHMAN'S ELECTRIC TIME DETECTOR.—Henry L. Norton, Ukiah, Mendocino Co., and Fred W. Cook, S. F. No. 417,501. Dated Dec. 17, 1889. This invention relates to that class of time-detectors for watchmen in which an alarm at a given point or central station is sounded by the closing of an electric circuit, said closing being effected by means of a circuit-closer located at the watchman's station or stations, and operated by means of a time-piece. The invention relates particularly to that class of these devices in which the sounding of the alarm is indicative of the failure of the watchman to attend to his duty at given times, said alarm being prevented by an act of the watchman when he is attending to his duty. The invention consists in the novel means for automatically closing the electric circuit to sound the alarm and of preventing the closing of said circuit by the act of the watchman in the course of his duty.

COLLAR-STUFFING MACHINE.—Geo. E. Hoyt, S. F. No. 417,560. Dated Dec. 17, 1889. This machine is intended to stuff the bodies of horse-collars with straw or filling, by which they are properly shaped. It consists of a vertical hopper, a rotary and reciprocating auger by which the filling material is forced into the collar, and a mechanism by which the double motion of the filling auger is produced, and by which the material is properly stirred and loosened up.

COLLAR-STUFFING MACHINE.—Calvin Ewing, S. F. No. 417,552. Dated Dec. 17, 1889. This is a machine for stuffing the rims of horse-collars with straw, and is an improvement on a machine patented by the same inventor Sept. 16, 1884.

STEAM BOILER FURNACE.—Willis G. Dodd, S. F. No. 417,475. Dated Dec. 17, 1889. This invention relates to that class of steam-boiler furnaces in which the fuel chamber is formed transversely of the furnace mouth, between inclined grate-bars and a grilling backing of vertical water-pipes communicating with the boiler. The objects of the improvements are to provide a furnace that will be almost automatic in its operation and obtain greater useful effect from the fuel consumed, with cheapness of construction, combined with simplicity, affording free access for repairs.

AIR-COMPRESSOR.—Samuel Guthrie, S. F. No. 417,482. Dated Dec. 17, 1889. This is an automatic apparatus for compressing air. The object is to employ a column of water under pressure to compress air from a compressing chamber into a receiver, the water being alternately admitted to and discharged from the chamber, so that when it is admitted it will force a body of air from this chamber into a receiver, and when discharged another body of air will be admitted to be again compressed, the operation being conducted automatically by the action of filling and discharging. By the plan employed the inventor is enabled to automatically compress air into large or small quantities and to any degree, limited only by the pressure of the column of water which is supplied to the compressing chamber.

DRY ORE CONCENTRATOR.—Miles B. Dodge, S. F. No. 417,476. Dated Dec. 17, 1889. This invention covers certain improvements in a machine for separating valuable heavy mineral or other substances from the lighter and worthless gangue. The present invention is an improvement upon one for which a patent was issued to the same inventor June 19, 1889.

WINDMILL.—Oscar H. Donley, San Jose. No. 417,549. Dated Dec. 17, 1889. The crank of the wheel-shaft is connected with a lever in the ordinary way; but this lever is curved so that each of its holes is equidistant from the axial center of the wheel-shaft, so that the link may be connected with any of the holes without changing the proper position of the piston in the pump, thereby rendering it practicable to vary the length of the stroke of the pump by setting the connecting-bolt in any of the holes. The connection of the lever with the pitman is such that this connection forms a sort of knuckle-joint permitting the oscillating movement of the lever and effecting the vertically reciprocating movement of the pitman, and also providing for the swiveling of the entire turntable about the pitman.

SPRAY NOZZLE.—John Bean, Los Gatos. No. 417,464. Dated Dec. 17, 1889. This is a nozzle or tip specially adapted for spraying and used in the treatment of infected trees, shrubs, vines, etc. It consists essentially in a novel imperforate packing-plate or sheet, controlling the nozzle passage and exit port. The object is to provide a spray nozzle capable of effective operation under a smaller pressure than usual and one which will not be affected injuriously in its adjustable or working parts by the liquid passing through it.

GUARD FOR CABLE CARS.—P. F. Dundon, S. F. No. 417,477. Dated Dec. 17, 1889. This is a novel device for guarding cars, motors or other vehicle and clearing obstructions from the tracks. Brushes are adjusted on the cars so as not to be more than an inch above the roadway. These brushes are preferably made of different lengths, the outer ones being longest and the rear ones somewhat shorter. Behind the brush is fixed a timber or bar so that the rear portion of the brush rests against this bar, and in case any heavy obstruction is encountered the bar supports the brush so that it becomes a rigid obstacle, and while being sufficiently flexible to accommodate itself to the body which may be struck and not injure it, it will be rigidly supported by the bar, which is placed near the track. Any small obstruction will be easily swept out of the way; but any large body or object projecting more than three inches above the roadbed will be struck by the flexible brush, which will meet it like a cushion and then, by aid of the bar behind the brush, which will prevent it from bending too far backward, the body will be pushed forward or to one side, depending on the shape of the brush-frame, and prevent it from passing beneath the wheels of the car.

ARID LANDS.—It is said that the new Arid Lands Committee of the House finds the problem of irrigating and reclaiming the vast tracts of Government land, now lying desert in the West, rather ponderous to handle; and there is talk of transferring the whole business to the Department of Agriculture.

THE November pay-roll of the Comstock Tunnel Company footed up a total of above $7000, which makes a total of $221,000 disbursed to employes of the Comstock lode for November services.

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For the half-year ending Dec. 31, 1889, a dividend has been declared at the rate of five and forty-hundredths (5 40-100) per cent per annum on Term Deposits, and four and one-half (4 1/2) per cent per annum on Ordinary Deposits. Payable on and after Thursday, Jan. 2, 1890.

GEO. TOURNY, Secretary.

DIVIDEND NOTICE.

SAN FRANCISCO SAVINGS UNION, 532 California St., cor. Webb. BRANCH, 1700 Market St., cor. Polk. For the half-year ending with the 31st of December, 1889, a dividend has been declared at the rate of Five and Four-Tenths (5 4-10) per cent per annum on term deposits and Four and One-Half (4½) per cent per annum on ordinary deposits, free of taxes, payable on and after Thursday, the 2d of January, 1890. LOYELL WHITE, Cashier.

UNION IRON WORKS,

Corner First and Mission Sts., San Francisco, Cal.

MANUFACTURERS OF

SPECIALTIES:
Scott & O'Neil Automatic Cut-off Engines, Ide Engines, Rock Breakers, Quartz Mills, Hoisting Engines.

MINING AND MILLING MACHINERY.

ROLLS AND CONCENTRATING MACHINERY. Cornish and Other **PUMPS.**

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SEND FOR CIRCULARS. CABLE ADDRESS "UNION."

PARKE & LACY COMPANY

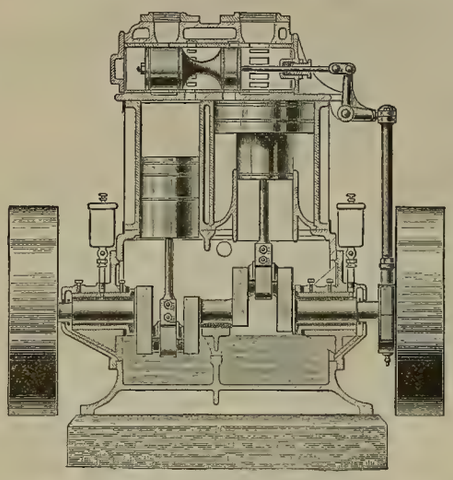
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CONCENTRATORS, PULVERIZERS,
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ROCK BREAKERS, DRY JIGS.

Bullock's Diamond Drills

GOLDEN GATE CONCENTRATORS,
GREATEST CAPACITY OF ANY CONCENTRATOR MADE,
One Machine Taking Pulp from 10 Stamps.



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SALES DURING LAST FOUR MONTHS:

COMPOUND, 44 ENGINES, 5215 HORSE POWER. STANDARD, 99 ENGINES, 4500 HORSE POWER. JUNIOR, 166 ENGINES, 4260 HORSE POWER.

Grand Total, 309 Engines, Aggregating 13,975 Horse Power.

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1850. 1888.

BUILDERS OF

MINING MACHINERY.

GENERAL OFFICE AND WORKS:
127 First St., San Francisco, Cal., U. S. A.
New York Office, 145 Broadway.

PLANTS FOR GOLD AND SILVER MILLS, embracing machinery of LATEST DESIGN and MOST IMPROVED construction. We offer our customers the BEST RESULTS OF 38 YEARS' EXPERIENCE in this SPECIAL LINE of work, and are PREPARED to furnish the MOST APPROVED character of MINING AND REDUCTION MACHINERY, adapted to all grades of ores and SUPERIOR to that of any other make, at the LOWEST POSSIBLE PRICES.

We are also prepared to CONSTRUCT and DELIVER in COMPLETE RUNNING ORDER, in any locality, MILLS, CONCENTRATION WORKS, WATER JACKET SMELTING FURNACES, HOISTING WORKS, PUMPING MACHINERY, ETC., ETC., of any DESIRED CAPACITY.

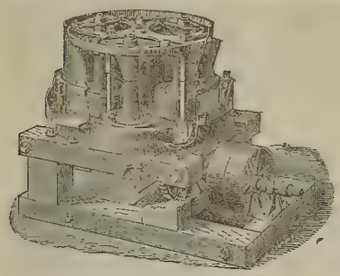
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Is beyond all question the most important improvement that has ever been made in this class of mining machinery. It will do more than twice the work with a given amount of wear than any other Crusher made, besides crushing so much finer that for mining uses, the capacity of the mill is greatly increased. It has the same relative superiority for macadamizing purposes, affording the cheapest and most reliable machine for this use.

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Centrifugal Roller Quartz Mill.

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MANUFACTURER OF

CENTRIFUGAL ROLLER QUARTZ MILLS,

Concentrators and Ore Crushers,

Mining Machinery of Every Description. Steam Engines and Shingle Machines.

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The railroad, mining and commercial center of the new State, offers some of the best inducements for investments in

Real Estate, Mines & Mining Stock

of any locality in the Northwest. For particulars address The Evans-Terry-Claussen Brokerage Co., 41 E. Broadway, Butte, Montana.

FOR SALE.

One 10x18 inch Clayton Belt Air Compressor.
One 8-inch Sergeant Drill.
One 6-ft. Double Screw Drifting Column with Arms.
One 4-ft. Single Screw Stoping Bar.
One 8½x18 ft. Air Receiver.

The above are in first-class condition and will be cheap. For price apply to the PAYMASTER MINING CO., Yuma, Arizona Territory

Smelter For Sale or Exchange.

One 50-ton, wrought iron, water-jacket Smelting Furnace (36"x60" at the tuyeres) of the latest design, with Crusher, Blower, Boiler, Pumps, Engines, Tools, and everything complete for immediate delivery, and only used about six months. Cheap for cash, or will exchange for interest in a Lead-Silver Mine, or erect in any mining camp that will guarantee a certain output. For further particulars address Box 28, Elkhorn, Montana.

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(A Corporation.)

Constantly on hand a full assortment of Manila Rope, Sisal Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.

Extra sizes and lengths made to order on short notice.

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AMALCAMATING MACHINERY.

Stamp Mills for Wet or Dry Crushing. Huntington Centrifugal Quartz Mill. Drying Cylinders. Amalgamating Pans, Settlers, Agitators and Concentrators. Retorts, Bullion and Ingot Moulds, Conveyors, Elevators, Bruckners and Howell's Improved White's Roasting Furnaces, Etc.

FRASER & CHALMERS, MINING MACHINERY

CONCENTRATING MACHINERY.

Blake, Dodge and Comet Crushers, Cornish Crushing and Finishing Rolls, Hartz Plunger and Collom Jigs. Frue Vanner & Embrey Concentrators, Evans', Calumet, Collom's and Rittenger's Slime Tables. Trommels, Wire Cloth and Punched Plates. Ore Sample Grinders and Heberle Mills.

IMPROVED CORLISS AND SLIDE VALVE STEAM ENGINES. ❋ BOILERS HORIZONTAL, VERTICAL ... AND SECTIONAL. ...

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Hoisting Engines, Safety Cages, Safety Hooks,

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Pumping Engines and Cornish Pumping Machinery,

IMPROVED WATER JACKET

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Roots & Baker Pressure Blowers,

SUSPENDED TRAMWAYS.

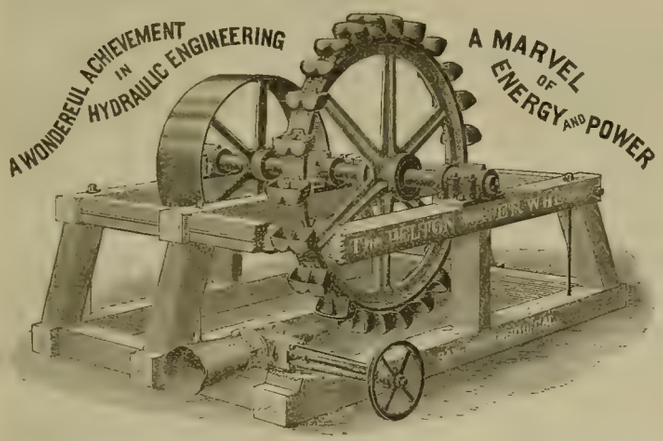
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THE PELTON WATER WHEEL

GIVES THE HIGHEST EFFICIENCY OF ANY WHEEL IN THE WORLD.



OVER 800 ALREADY IN USE.

Affords the Most Simple and Reliable Power for all Mining and Manufacturing Machinery.

Adapted to heads running from 20 up to 2,000 feet.

From 12 to 20 per cent better results guaranteed than can be produced from any other Wheel in the Country.

ELECTRIC TRANSMISSION.

Power from these Wheels can be transmitted long distances with small loss, and is now extensively used in all parts of the country for generating both power and light.

APPLICATIONS

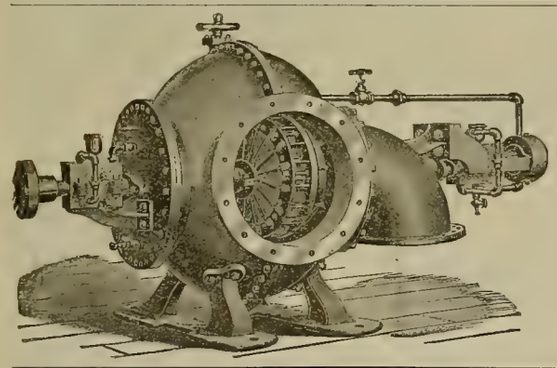
Should state amount, and head of water, power required, and for what purpose; with approximate length of pipe; also, whether the application is with reference to *Wheels* or *Motors* described below. SEND FOR CIRCULARS.

The Pelton Water Wheel Co.

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PELTON WATER MOTORS.

Varying from the fraction of 1 up to 15 and 20-horse power. Unequaled for all light-running machinery. Warranted to develop a given amount of power with one-half the water required by any other. ☞ SEND FOR MOTOR CIRCULAR. ADDRESS AS ABOVE. ☜



JAMES LEFFEL'S Mining Turbine Water Wheel.

These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

JAMES LEFFEL & CO.,

Springfield, Ohio, or 110 Liberty St., New York.

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CALIFORNIA IRON YARD.

HENRY J. ROGERS & CO.

Successors to CHAS. CALLAHAN

IMPORTERS AND DEALERS IN

CAST and WROUGHT IRON SCRAP

SECOND-HAND BOILERS AND OLD MACHINERY

Of every description.

The Highest Price paid for all kinds of Metals.

OFFICE AND YARD: 128 and 130 Folsom St., S. F. Telephone No. 67.

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Hydraulic Mining Property in Southern Oregon. Good, Extensive. For particulars (Principals only) address,

"A. M.," Box 77, Grants Pass, Oregon.

THOMAS PRICE & SON,

Assay Office, Chemical Laboratory,

BULLION ROOMS and ORE FLOORS,

524 Sacramento Street, San Francisco, Cal.

COIN RETURNS ON ALL BULLION DEPOSITS IN 24 HOURS.

WORKING TESTS OF ORES BY ALL PROCESSES.

SPECIAL ATTENTION PAID TO CONCENTRATION OF ORES.

Ores Received on Consignment, Sampled, Assayed, and Disposed of in the Open Market to the Highest Bidder.

Metallurgy and Ores.

SELBY SMELTING and LEAD CO.,

416 Montgomery St., San Francisco.

GOLD AND SILVER REFINERY And Assay Office.

Highest Prices Paid for Gold, Silver and Lead Ores and Sulphurets.

MANUFACTURERS OF

BLUESTONE, LEAD PIPE, SHEET LEAD, SHOT, Etc., Etc.

ALSO MANUFACTURERS OF

Standard Shot-Gun Cartridges, Under Chamberlin Patent.

JOHN TAYLOR & CO.,

IMPORTERS AND DEALERS IN

ASSAYERS' MATERIALS, MINE AND MILL SUPPLIES,

ALSO CHEMICALS, AND PHYSICAL, SCHOOL AND CHEMICAL APPARATUS.

63 & 65 First St., cor. Mission, San Francisco.

We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price. Our New Illustrated Catalogue, with prices, will be sent on application.

☞ Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Morgan Crucible Co., London, England. Also for E. G. Denniston's Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices.

JOHN TAYLOR & CO.

Nevada Metallurgical Works.

NO. 23 STEVENSON STREET,

Near First and Market Streets, S. F.

C. A. LUCKHARDT, Manager. ESTABLISHED 1869

Ores worked by any Process.

Ores Sampled.

Assaying in all its Branches.

Analyses of Ores, Minerals, Waters, etc.

Working Tests (practical) Made.

Plans and Specifications furnished for the most suitable Process for Working Ores.

Special attention paid to Examinations of Mines; Plans and Reports furnished.

C. A. LUCKHARDT & CO.,

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Mining Engineers and Metallurgists

J. KUSTEL. G. KUSTEL.

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318 Pine St. (Basement.,

Corner of Leidesdorff Street, - - SAN FRANCISCO

Ores Sampled and Assayed, and Tests made by my Process.

Assaying and Analysis of Ores, Minerals and Waters.

Mines Examined and Reported on.

Practical Instruction given in Treating Ores by improved processes.

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GREAT REDUCTION!

BATTERY SCREENS.

Best and Cheapest in America.

No imitation, no deception, no planished or rotten iron used. Only genuine Russia iron in Quartz Screens. Planished iron screens at nearly half my former rates.

I have a large supply of Battery Screens on hand suitable for the Huntington and all Stamp Mills, which I will sell at 20 per cent discount.



PERFORATED SHEET METAL

For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass. Zinc and other metals punched for all uses.

Inventor and Manufacturer of the celebrated Slot Cut or burred and Slot Punched Screens.

Mining Screens a specialty, from No. 1 to 15 (fine).

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JOHN W. QUICK, Proprietor.

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Dec. 26, 1889.

Continued rains and bad roads interfere with general trade.

The local money market is closing the year very easy, causing the impression that after the turn of the year we will have a very easy market. Imports of coin by sea the past week aggregate $500,000 from Australia and about $100,000 from coast ports. Remittances from other points by rail are said to have also been quite free.

MEXICANS—The demand for shipment by the steamer leaving to-day (Thursday) for China was light. Prices ranged about 76¾ to 77 cts. The quotation given to-day is 76¾ cts. nominal.

SILVER—The market abroad has been gradually shading off throughout the week. The close money market abroad and inactive demand from India and elsewhere are against the market. The opinion still prevails that before the spring months a much higher range of values will obtain. The influences that will conspire to bring this about have been heretofore noted in these columns. The steamer leaving to-day for China took out very small shipments. The last sale reported to us was at a slight advance over 95¾ cts. The market closed dull at a nominal quotation of 95 cts.

QUICKSILVER—Receipts the past week aggregate 240 flasks. The market is reported quiet and easy.

BORAX—Receipts the past week aggregate 102 ctls., and exports by sea 444 ctls. to New York. The market is reported steady with a firm holding at pool prices.

LIME—Receipts the past week aggregate 1446 bbls., and exports by sea 500 bbls. to Honolulu. The market is quiet but steady at current quotations.

ANTIMONY—The market is easier, with buyers disposed to be offish.

LEAD—The market has a firm, strong closing under freer buying at the East. The strength of the market at the close of the year is a source of surprise to the many who do not look at the influences bome and abroad.

TIN—Imports the past week aggregate 3235 ingots from Australia. The market for plate for spot or near-by receipts is barely steady at quotations. For distant shipments or prompt shipment the market is very strong, but with no business doing, and late cables from London report as follows: The tin-plate market is steadier, with 15s. 9d. now considered a strictly inside price for cokes. Buyers experience difficulty in placing orders at this figure, as makers are full at present and confident that prices will go higher. It is stated that two-thirds of the entire available stock is stored at Swansea, The exports to the States last month were 315,000 tons, against 271,000 tons a year ago.

COPPER—The market after shading off closed stronger under advices from abroad. The New York *Iron Age's* London cable reports as follows: The movements of the holders of French syndicate stock are extremely difficult to follow, but the meager facts coming to the surface indicate that they realize quietly when favorably opportunity offers, avoiding the open market in London as much as possible. Calcining in Spain is again becoming seriously discussed in all its details by the Council of Ministers, who, it is reported, have decided that on January 1st the quantity of ore treated shall be reduced one-half from the present amount. A commission of engineers has been appointed to see that the law is carried out. The action is considered a serious matter for the Rio Tinto and other Spanish companies. General prospects in the copper trade are considered excellent.

IRON—The market is reported very strong, but business light. Puget sound iron has been advanced to $35. The company has shut down for three or four months so as to put in new furnaces.

COAL—Imports the past week aggregate as follows: From Newcastle, N. S. W., 3340 tons; Seattle, 810; Cornox, 4000; Departure Bay, 2300; Coos, 750; total, 10,200 tons. Australian for shipment is offering at lower prices owing to lower outward charters. With the lower offerings of Australian, coast coal for forward delivery is easier. The mild weather is against the market, and unless colder weather sets in soon it is not at all unlikely but some shading in prices will be in order. Large consumers do not appear disposed to anticipate their wants to any great extent unless offered inducements, and even then they do not care to stock up heavily.

Eastern Metal Markets.

By Telegraph.

NEW YORK, Dec. 26, 1889.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	43 15-16	95½	$13 90	$3 90	$21 25
Friday	44	95¾	13 90	3 90	21 10
Saturday	43 15-16	95½	13 90	3 90	21 10
Monday	43⅞	95½	14 10	3 85	21 00
Tuesday	43 13 16	94⅞	14 10	3 90	21 00
Wednesday	....	...	.....	....	.....

NEW YORK, Dec. 24.—Copper holds firm at previous quotations. Borax continues steady with a good demand. Antimony under freer receipts and an offish demand is shading off. Tin is firmer, with an improved demand looked for. Quicksilver is easier. Lead is firm.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, December 26, 1889.

ANTIMONY—		25 @	—
BORAX—Refined, in carload lots		7¼@	7⅝
Powdered	" " "	7¾@	—
Concentrated	" " "	— @	6¾
All grades jobbing at an advance.			
COPPER—			
Bolt		21 @	22
Sheathing		22 @	24
Ingot, jobbing		17 @	18
do, wholesale		15 @	16
Fire Box Sheets		22 @	24
LEAD—Pig		4½@	4¾
Bar		5 @	—
Sheet		7 @	—
Pipe		6 @	—
Shot, discount 10½ on 500 bags	Drop, ₱ bag.	1 45 @	—
Buck, ₱ bag		1 65 @	—
Chilled, do		1 85 @	—
STEEL—English, lb		16 @	20
Canton tool		9 @	9
Black Diamond tool		9 @	9
Pick and Hammer		8 @	10
Machinery		4 @	5
Toe Calk		4½@	—
TINPLATE—B. V., steel grade, 14x20, P. S.		5 50 @	—
B. V., steel grade, 14x20, spot		4 95 @	5 10
Charcoal, 14x20	" "	6 75 @	7 00
do roofing, 14x20	" "	5 50 @	—
do, do, 20x28	" "	11 00 @	—
Pigtin, spot, ₱ lb		23 @	25
COKE—Eng., ton, spot, in blk		13 50 @	15 00
Do, do, to load		16 00 @	—
QUICKSILVER—By the flask		47 50 @	—
Flasks, new		@	—
Flasks, old		35 @	—
CHROME IRON ORE, ₱ ton		10 00@	—
IRON—Bar, base		3 @	3½
Norway, base		4½@	5¼

	Spot.	To Load.
IRON—Glengarnock ton	35 00 @ —	34 @ —
Eglinton, ton	35 00 @ —	32½@ —
American Soft, No. 1, ton	— @35 00	32½@ —
Oregon Pig, ton	— @35 00	— @ —
Puget Sound	35 00 @ —	— @ —
Clay Lane White	— @28 00	27½@ —
Shotts, No. 1	35 00 @35 00	32½@ —
Bar Iron (base price) ₱ lb	— @ —	— @ —
Langloan	35 00 @ —	34 @ —
Thorncliffe	35 00 @ —	34 @ —
Cartsherrie	35 00 @ —	34 @ —

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$20 00	$17 00
41 to 50 ft	21 00	18 00
51 to 60 ft	23 00	20 00
61 to 70 ft	27 00	21 00
1x3, fencing	22 00	19 00
1x4, "	21 00	18 00
1x3, 1x4 and 1x6, odd lengths	19 00	16 00
Second quality	17 00	15 00
Selected	24 00	22 00
Clear, except for flooring	31 00	28 00
Clear for flooring	2 00	.....
Clear V. G. No. 1 flooring	6 00	.....
Firewood	14 00	10 00
Dressed Pine, flooring, No. 1, 1x6	32 00	29 00
No. 1, 1x4	30 00	30 00
No. 1, 1¼x4, 1¼x6, and odd sizes	37 00	33 00
All sizes, No. 2	27 00	24 00
Stepping, No. 1	44 00	35 00
Stepping, No. 2	34 00	25 00
Ship timber and plank, rough	27 00	18 00
Selected, planed 1 side, av'ge 40 ft	29 00	24 00
" " 2 " " "	31 00	26 00
" " 3 " " "	33 00	28 00
" " 4 " " "	35 00	30 00
Deck plank, rough, average 35 ft	35 00	32 00
Dressed, average 35 feet	40 00	35 50
Pickets, rough, B. M	20 00	16 00
¼x1½, 4 ft long, ₱ M	6 50	5 00

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	7 50 @ 7 75	Cardiff	9 50@10 00
Liverpool St'm	8 50 @—	Lehigh Dump	16 50@17 00
West Hartley	8 50 @ 9 00	Cumberland bk	16 00@16 50
Scotch Splint	9 00 @ 9 00	Egg, hard	15 50@16 00

SPOT FROM YARD.

Wellington	$ 9 00	Seattle	7 00
Scotch Splint	9 00	Coos Bay	6 00
Greta	9 00	Cannel	12 00
Westminster Brymbo	9 00	Egg, hard	18 00
Nanaimo	9 00	Cumberland, in sacks	19 00
Sydney	8 00	do, bulk	18 00
Gilman	7 0		

Mining Share Market.

The Comstock shares gained in strength up to Monday afternoon under the leadership of Belcher and Seg. Belcher, after which they shaded off, but recovered only to shade off again. The closing under light business on Tuesday was fairly firm. The advance is said to be due to an improvement in the 1250-foot Belcher south drift, ore assays going up to $20. This is called low-grade ore and only to frighten the smaller shorts into filling would not otherwise be noticed much. The middle and North End stocks were stronger and slightly higher under fair trading. In outside stocks trading was light in the Tuscaroras, but more active in the Quijotoas under a reported improvement in Peerless and more active work in two of the others. The Bodies were lifeless.

The bear reports noted in last week's issue continue to be freely circulated. Letters received from Sacramento and other stock-trading points are confirmatory of bear points being put out with the assurance given that the Bonanza firm was not doing anything in the market, outside of selling stocks whenever an opportunity presented. To this was added the correct information of more assessments to be levied within the next 30 days. The majority of outside dealers either sold out entirely or else sold from one-quarter to three-quarters of their holdings. Who has bought the stocks? is a leading question, and as yet not at all satisfactorily answered. It is no reason because stocks have drifted into other hands that persons of limited means should overbuy, for we have seen prices go very low under strong buying, as to clean up every share either held on a margin or held by banks or capitalists against money accommodations, before much of an upward move set in.

The New York *Engineering and Mining Journal* says that the Eastern shareholders are combining to make a fight for the control of Silver King at the next annual election, with the view of securing a majority of the board of directors and elect H. H. Noble president. By electing Mr. Noble president they claim that the mine will be honestly run. We know nothing regarding the management of the Silver King mine, but we advise Eastern stockholders that they might consult their interest to good advantage by looking over the court record in Department 6, Superior Court of California, in the Kentuck mining suit lately decided in favor of Smith et al. vs. or Washington Smith et. al vs. Wales Palmer and the Kentuck Mining Company. In this action it was shown that H. H. Noble was treasurer and a director of the company at the time Governor Stevenson obtained a contract from the company to work the mine, which netted the contractor large sums of money.

The charge of the Nevada mill for crushing Crown Point ore is $6 a ton. This charge includes transportation, so the only milling company charging $7 a ton is said to be the mill running on Con. Virginia ore.

Private advices from the Comstock mines are still of a very flattering, hopeful character. They are confirmatory of previous information published by us, that the work going on in several of the mines ought to uncover a body of ore soon, but how rich or to what extent time can alone tell, but perhaps enough to make shorts fill and get the outside public to pay assessments along the line. By referring to back files of the PRESS more particulars of the work now going on can be had. In Ophir it is claimed that the work now going on is to tap a body of ore near the Con. Virginia line. From Con. Virginia a decided improvement is reported on the 1350-foot level. In Belcher, as work goes toward Seg. Belcher, an improvement is reported. Official letters from the Gold Hill mines have not been received up to this (Thursday) morning writing. From Hale & Norcross the advices are about as heretofore reported, with the grade of ore assaying still less. Here is a chance for the Mining Stock Association to make itself felt, as well as also in looking after the Savage assays. Private advices report the mine assays quite high. If correct, who gets away with the "boodle"? From the outside mines there is nothing new to report.

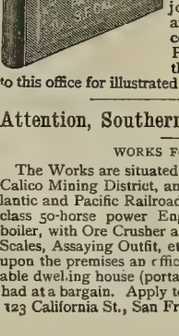
The mining share market opened this (Thursday) morning dull but higher, with Chollar and Potosi the leaders.

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Butte and Boston, Dec. 18, $27,360; Moulton, 19, $8128; Eureka Con., 18, $15,000; Mt. Diablo, 18, $7938; Hanauer, 17, $6550; Germania, 17, $2701; Young America South, 17, $9300; Hanauer, 18, $2950; Ontario, 18, $20,323; Germania, 19, $2679; Hanauer, 20, $4750; Con. California and Virginia, 21, $52,524; Savage, 21, $15,586; Hale and Norcross, 21, $36,638; Crown Point, 21, $8482; Hanauer, 21, $2400; Crocker, 21, $12,580.

What Every Subscriber Should Have.



AN EASY BINDER.—A. T. Dewey's Patent Elastic Binder, for periodicals music and other printed sheets, is the handiest, best and cheapest of all economical and practical file binders. Newspapers are quickly placed in it and held neatly, as in a cloth-bound book. It is durable and so simple a child can use it. Price, size of Mining and Scientific Press, Rural Press, Watchman, Fraternal Publishing Co's. journals, Harper's Weekly and Scientific American, 85 cents; postage 10 cents. Postpaid to subscribers of this paper, 50 cents. Send to this office for illustrated circular. Agents wanted.

Attention, Southern California Miners.

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The Works are situated at Daggett, Cal., in the Calico Mining District, and on side-track of the Atlantic and Pacific Railroad. They contain a first-class 50-horse power Engine and 45-horse power boiler, with Ore Crusher and other machinery, Mill Scales, Assaying Outfit, etc., all nearly new. Also upon the premises an office building and a comfortable dwelling house (portable). The above can be had at a bargain. Apply to GILLISPY & CHILDS 123 California St., San Francisco,

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELING'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Belle Isle M Co	Nevada	13	15	Dec 4	Jan 30	J W Pew	310 Pine St
Bullion M Co	Nevada	35	25	Dec 4	Jan 24	R R Grayson	327 Pine St
Bodie Con M Co	California	11	25	Nov 11	Dec 17	E L Burling	309 Montgomery St
Booth G M Co	California	4	2	Nov 23	Dec 28	Geo R Spinney	310 Pine St
Con Imperial M Co		26	5	Nov 22	Dec 27	Jan 15 C L McCoy	329 Pine St
Con New York M Co	Nevada	2	15	Dec 11	Jan 15	Feb 5 C E Elliott	309 Montgomery St
Calaveras Blue Gravel Co	California	4	3	Nov 15	Dec 23	Jan 14 B Burris	240 Montgomery St
Exchequer M Co	Nevada	28	25	Dec 16	Jan 21	Feb 11 C E Elliott	309 Montgomery St
Golden Giant M Co	California		¼	Dec 17	Jan 23	Feb 12 H T Briggs	Downieville
Gray Eagle M Co	California	15	6	Oct 16	Nov 18	Jan 4 J M Buffington	303 California St
Grand Prize M Co	Nevada	23	30	Nov 21	Dec 24	Jan 15 R R Grayson	329 Pine St
Kentuck M Co	Nevada	20	30	Dec 11	Jan 14	Feb 4 J W Pew	310 Pine St
Livermore Coal M Co	California	1	50	Nov 15	Dec 18	Jan 4 G C Higgins	120 Sutter St
Mexican M Co	Nevada	39	25	Dec 21	Jan 27	Feb 18 C E Elliott	309 Montgomery St
Mono G M Co	California	29	25	Nov 18	Dec 23	Jan 24 B L Burling	309 Montgomery St
North Occidental G & S M Co	Nevada	1	7	Dec 2	Jan 6	Jan 27 W H Watson	302 Montgomery St
Nevada Queen M Co	Nevada	6	20	Oct 31	Dec 4	Dec 30 H Deas	309 Montgomery St
Palisade M Co	Nevada	2	5	Nov 1	Dec 26	Jan 20 D Buck	309 Montgomery St
Platt & Gilson G M Co	California	4	3 00	Nov 13	Dec 20	Jan 6 C Herrmann	326 Kearny St
Russell Reduction & M Co	California	5	5	Nov 11	Dec 16	Jan 8 J Morizio	328 Montgomery St
Savage M Co	Nevada	74	50	Nov 5	Dec 10	Dec 30 E B Holmes	309 Montgomery St
Summit G M Co	California	11	5	Nov 14	Dec 20	Jan 14 B L Burling	309 Montgomery St
Trinity River Tunnel & M Co	California	2	50	Nov 27	Jan 6	Jan 28 L H Peckman	28 California St
Tetrakoff M Co	California	3	1	Dec 14	Jan 21	Feb 14 W J Garrett	308 Pine St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F	MEETING	DATE
Alaska M Co	California	A T Corbus	420 Montgomery St	Annual	Dec 30
Bald Mt Extension M Co	California	J W Orear	Downieville	Annual	Jan 23

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Champion M Co		T Wetzel	522 Montgomery St	10	Nov 25
Caledonia M Co	Nevada	A S Chemiuant	328 Montgomery St	08	Aug 5
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	50	Dec 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	70	Aug 25
Idaho M Co	California		Grass Valley	5 00	Nov 7
Mt Diablo M Co	Nevada	R Heath	319 Pine St	30	Oct 23
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Nov 10

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Dec. 4.		WEEK ENDING Dec. 11.		WEEK ENDING Dec. 18.		WEEK ENDING Dec. 25.	
Alpha	1.10	1 25	1.05	1.15	.75	1.05	.80	.95
Alta	1.60	2.00	1.15	1.70	1.10	1.30	1.25	1.30
Andes	.45	.55	.45	....	.30	.40	.40	.45
Belcher	2.40	2 65	2.15	2.45	1.60	2.10	1.85	2.15
Best & Belcher	2.80	3.15	2.70	2.9	2.25	2.65	2.35	2.50
Bullion	....	....	.40	.50	.40	.45	.30	.40
Bodie Con	.45	....	.50	.55	.60	.70	.65	.65
Benton	5.00	....	4.00	....	....	....	....	....
Bulwer	....	....	....	.15	....	....	....	....
Commonwealth	2 80	3.10	3 00	3.10	3.00	3.10	3.00	....
Con. Va. & Cal	5¾	6¾	5	5¾	4.05	4.9	4 25	4.70
Challenge	1.60	1.8	1.35	....	1.05	1 35	1.10	1 25
Chollar	1.55	2.10	1.95	2.50	2 05	2.6	2.15	2.45
Confidence	4.30	4.35	....	4¼	3.80	4.10	3¾	....
Con. Imperial	.25	.30	.25	....	....	.20	.20	.30
Caledonia	.15	.20	.15	....	.15	....	.15	....
Crown Point	1.90	2.55	1.65	2.15	1 35	1.70	1.50	1.90
Crocker	.25	....	.25	....	....	.25	.26	....
Eureka Con	....	....	....	....	3.10	3.20	....	....
Exchequer	.53	....	.55	.55	.25	.40	.25	....
Grand Prize	.45	.55	.40	.60	.35	.40	.35	....
Gould & Curry	1.60	1.75	1.50	1.6	1.30	1.50	1.30	1.50
Hale & Norcross	2.75	3.00	2.70	2.90	2.30	3.80	2.30	2.55
Julia	.35	.38	.30	....	.30	.35	.30	....
Justice	1.50	1.65	1.40	1.50	1.25	1.45	....	....
Keystone	.35	.38	.60	.70	.30	.55	....	....
Lady Wash	.30	.40	.25	.30	.25	....	.30	....
Mono	.35	....	....	....	.05	.15	.40	.45
Mexican	2.80	3.20	2.60	2.95	2.20	2.65	2.20	2.60
Navajo	.30	....	.25	.30	.30	....	.30	....
North Belle Isle	1.00	1.15	.90	1.20	1.00	1.20	1.10	1.20
New Queen	.70	.80	.75	.85	.80	1.00	.85	1.00
Occidental	1.05	1.05	.75	.95	.60	.70	.50	.55
Ophir	3.75	4.20	3.65	3.90	3.00	3.60	3.05	3.60
Overman	.80	.95	.70	.80	.50	.70	.90	.75
Potosi	1.70	1.80	1.70	2.20	1.75	2.25	1 75	1.90
Peerless	.20	.25	.25	....	.20	.35	.30	.35
Peer	....	....	.15	....	.10	....	.15	....
Savage	1.25	1.50	1.30	1.85	1.40	1.80	1.40	1.55
S. B. & M	1.10	1.50	1.00	1 15	.80	1.05	.75	1.15
Sierra Nevada	2.40	2.65	2.25	2.60	1.75	2.15	1.75	2.00
Silver Hill	.35	....	.35	....	.25	.30	....	....
Scorpion	....	....	....	....	.10	.15	.10	.15
Union Con	2.80	3.15	2.55	2.80	2 10	2.55	2.10	2.40
Utah	.75	.85	.65	.80	.50	.70	.60	....
Weldon	....	....	....	....	....	....	....	....
Yellow Jacket	2.40	2.80	2.25	2.45	1.75	2.20	1.70	2.05
.....	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY, Dec. 26, 9:30 A. M.

100	Alta	1.30	
450	Alpha	1.05	
150	Belcher	2.15	
100	B. & Belcher	2.55	
450	Chollar	2.50	
200	Confidence	4.10	
200	Con. Imperial	30c	
20	Con Va & Cal	4.65	
50	Gould & Curry	1.50	
100	Hale & Nor	2.65	
100	Mexican	2.50	
200	Overman	80c	
605	Potosi	2.00	
200	Peerless	30c	
850	S. B. & M	1.25	
700	Silver Hill	35c	
200	Utah	1.65	
200	W Comstock	15c	

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Assessment Notices.

Booth Gold Mining Company. Location

of principal place of business, San Francisco, California.

Location of Works, Auburn, Placer Co., Cal.

NOTICE is hereby given that, at a meeting of the Board of Directors, held on the 23d day of November, 1889, an Assessment, No. 4, of Two(2) Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin, to the Secretary, at the office of the Company, No. 310 Pine Street, Room No. 28, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of December, 1889, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the 20th day of January, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

GEO. R SPINNEY, Secretary.

Office, No. 310 Pine Street, Room No. 28, San Francisco, California.

DELINQUENT SALE NOTICE.

Gray Eagle Mining Company, Location

and principal place of business, San Francisco, California. Location of Works, Placer Co., Cal.

NOTICE.—There are delinquent upon the following described Stock, on account of Assessment (No. 15), levied on the 16th day of October, 1889, the several amounts set opposite the names of the respective Shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
Brown, G. A.	463	100	$ 6 00
" G. A., Trustee	464	5,000	300 00
" " "	465	2,500	150 00
Bogart, O. H., Trustee	414	500	30 00
" " "	428	100	6 00
" " "	430	100	6 00
" " "	431	100	6 00
" " "	432	100	6 00
" " "	433	100	6 00
" " "	435	50	3 00
" " "	436	100	6 00
" " "	447	5,000	300 00
" " "	470	1,000	60 00
" " "	484	200	12 00
" " "	485	200	12 00
Colton, A. O., Trustee	243	100	6 00
" " "	244	100	6 00
Carnes, W. A.	252	416	24 96
Chase, Q. A., Trustee	410	3,814	228 84
Durning, T. G., Trustee	231	440	26 40
Ettlinger, Isaac	137	600	36 00
Field, W. A.	403	100	6 00
Francis, H. L., Trustee	444	1,500	90 00
Gray, H. W., Trustee	416	200	12 00
Horton, Thos. R., Trustee	315	5,000	300 00
Hersey, C. S.	95	200	12 00
Hall, Wm. E.	131	900	54 00
" " "	154	1,000	60 00
Hall, Wm. E., Trustee	411	200	12 00
" " "	412	200	12 00
Nash, H. W.	289	104	6 24
Rosekrans, H. M.	39	600	36 00
Riordan, Thos. D.	491	12	72
" Thos. D., Tru-tee	415	500	30 00
" " "	416	500	30 00
" " "	417	500	30 00
" " "	418	500	30 00
" " "	492	500	30 00
Stout, C. S.	486	100	6 00
" " Trustee	422	106	6 36
" " "	476	2,000	120 00
Scarles, W. A., Trustee	129	250	15 00
" " "	322	250	15 00
" " "	429	1,040	62 40
Shankland, Robt.	144	600	36 00
" "	173	400	24 00
Taylor, J. N.	102	1,000	60 00
" "	330	40	2 40
Waller, L. P. F., Trustee	368	100	6 00
" " "	367	3,000	180 00
" " "	458	100	6 00
" " "	459	100	6 00
" " "	460	100	6 00
Winn, A. H., Trustee	466	1,000	60 00
Wetzel, Theo., Trustee	337	40	2 40
" " "	360	1,000	60 00

And in accordance with law, and an order of the Board of Directors, made on the 16th day of October, 1889, so many shares of each parcel of such Stock as may be necessary, will be sold at public Auction, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California, on TUESDAY, THE TENTH (10th) DAY OF DECEMBER, 1889, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

J. M. BUFFINGTON, Secretary.

Office, Room 11, No. 303 California St., San Francisco, California.

POSTPONEMENT.

At a meeting of the Board of Directors of the Gray Eagle Mining Company, held this day, the day of sale of the above delinquent stock was postponed until Friday, the Third (3d) Day of January, 1890, at the hour of one (1) o'clock P. M.

San Francisco, Dec. 10, 1889.

J. M. BUFFINGTON, Secretary.

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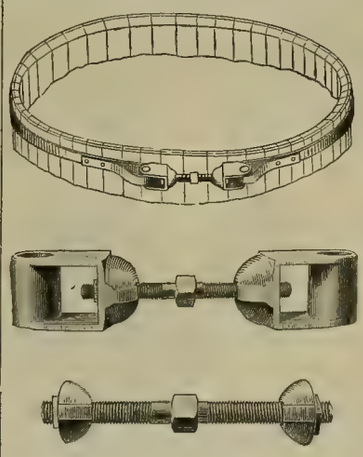
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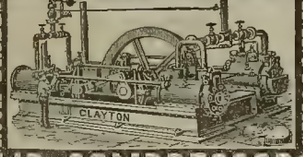
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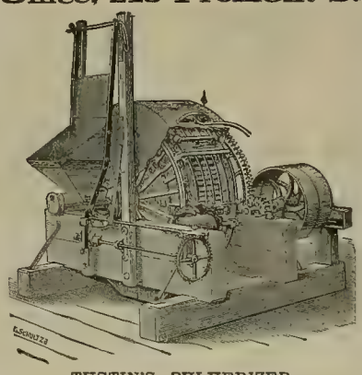
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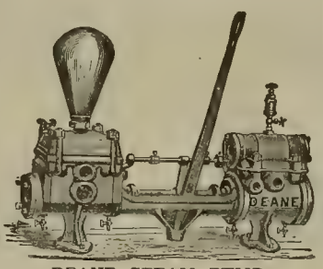
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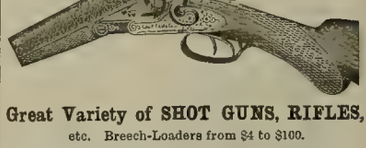
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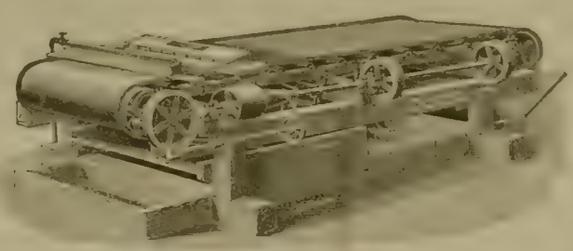
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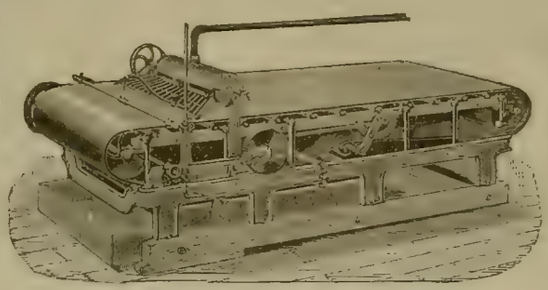
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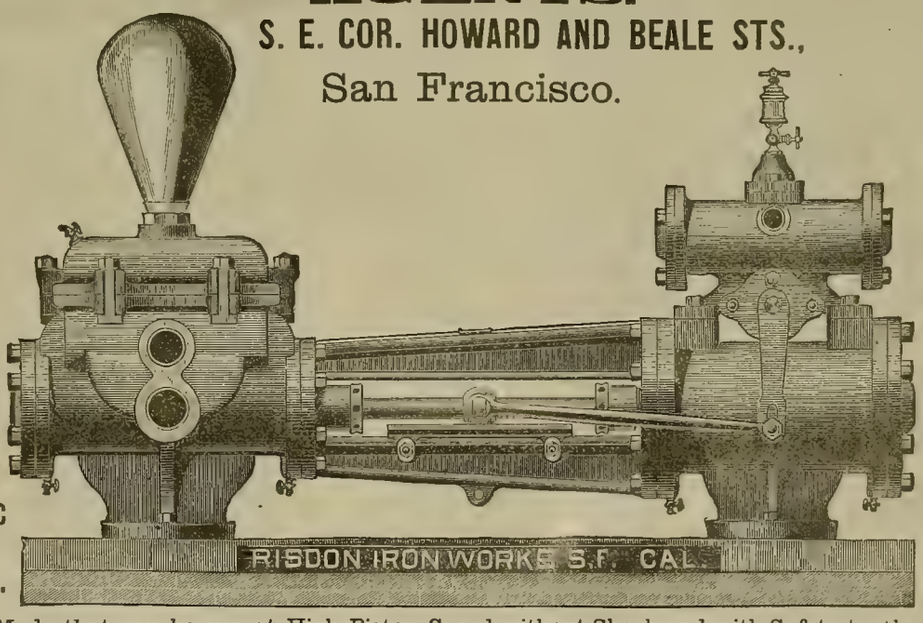
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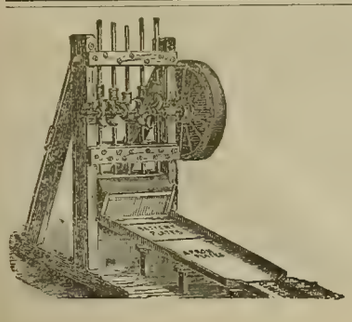
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